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Social Risk Management Strategies and Health Risk Exposure

Insights and Evidence from Ghana and Malawi

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Social Risk Management Strategies and Exposure to High Health Risks in Developing Countries

Theoretical insights and empirical evidence from the Sub-Saharan countries Ghana and Malawi

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Abbreviations and Acronyms

ADL	Activities of Daily Living
ART	Anti-Retroviral Therapy
ASCA	Accumulating Savings and Credit Association
CAM	Carte d'Assurance Maladie
CCT	Conditional Cash Transfers
CHAM	Christian Health Association Malawi
DALY	Disability-Adjusted Life Year
DCG/HCC	Diagnostic Cost Groups and Hierarchical Condition Categories
DMHIS	District Mutual Health Insurance Schemes (Ghana)
EHP	Essential Health Package
FINCA	Foundation for International Community Assistance
GDP	Gross Domestic Product
GHS / Gc	New Ghana Cedis (currency)
GNI	Gross National Income
HDI	Human Development Index
HH	Household
ILO	International Labour Organization
IMF	International Monetary Fund
LR	Likelihood Ratio
MASM	Medical Aid Society Malawi
MCA	Multiple Correspondence Analysis
MFI	Microfinance Institution
MHI	Micro Health Insurance
MK / MWK	Malawi Kwacha (currency)
MoH	Ministry of Health
MUSCCO	Malawi Union of Savings and Credit Cooperatives
(C)NCDs	(Chronic) Non-communicable Diseases
NGO	Non-Governmental Organization
NHIA	National Health Insurance Authority (Ghana)
NHIF	National Hospital Insurance Fund (Kenya, Ghana)
NHIS	National Health Insurance Scheme (Ghana)
OECD	Organisation for Economic Co-operation and Development

OIBM	Opportunity International Bank Malawi
OLS	Ordinary-least-square (estimation)
OOPS	Out-of-Pocket Spending
PCA	Principal component analysis
PPP	Purchasing Power Parity
RoSCA	Rotating Savings and Credit Association
SACCO	Savings and Credit Cooperative
SD	Standard Deviation
SES	Socio-Economic Status
SHG	Self-Help Group
SHI	Social Health Insurance
SLA	Service Level Agreement (Malawi)
SRM	Social Risk Management
SSA	Sub-Saharan Africa
SSNIT	Social Security and National Insurance Trust (Ghana)
STD	Sexually transmitted diseases
SWAp	Sector-Wide Approach
THE	Total Health Expenditure / Total expenditure on health
TIOLI	Take-it-or-leave-it
UMEOA	West African Economic and Monetary Union
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USD	United States Dollar
VAT	Value Added Tax
VCT	Voluntary Counseling and Testing
VIFs	Variance Inflation Factors
WHO	World Health Organization
WTP	Willingness to Pay

1. Introduction

1.1. Context & relevance

Risk exposure is a main cause of poverty, deprivation and persistent vulnerability of individuals and households worldwide. A decline of well-being as a result of risk occurrence is a common and unifying experience for every human-being. Risks such as illness, injury or problems related to old age, unemployment or price fluctuations, harvest failure and weather shocks or natural disasters, crime or domestic violence can have devastating effects on the individual and household's well-being, threatening its level of subsistence.[1] Therefore, as a result of risks, individuals and households devote a considerable amount of physical and cognitive energy, as well as social engagement, responding to shocks and averting transitory or permanent damage.

However, risk exposure is not evenly distributed. The level of exposure to risks significantly varies between countries and between individuals and households. Individuals and households in low-income countries may experience a considerably higher risk exposure, as they often live in an environment with economic, social and political instabilities, and experience environmental or natural disasters. Poorer households tend to be more exposed to risks than wealthier households, mostly due to their more dangerous and less protected living circumstances. Also, illness is not evenly distributed. Some individuals and households are extraordinarily exposed to health risks and high health care costs. Empirically, a relatively small percentage of households face health care costs that far exceed average health care costs. Generally, health risks, and the resulting health care costs, occur randomly. However, some individuals and households systematically show a higher likelihood of experiencing high health care costs. A variety of risk factors exist that can explain future above average health care costs, with chronic diseases being only the most prominent example. Health risks cause a double negative impact on individuals and households, firstly due to the loss of health itself and secondly due to illness-related costs. These include the actual direct treatment costs and indirect costs, such as lost income of the ill, disabled or injured person and, potentially, other household members caring for him/her.

Even more than the variation of pure risk exposure, the mechanisms put in place in order to eliminate or reduce the probability of risks and reduce the burden of the re-

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[1]   cp. The World Bank (2001): Attacking Poverty. World Development Report 2000-2001. Oxford Univ Press. Washington, D.C., p. 137f.

sulting shock also vary. Individuals and households use a wide array of *risk manage-
ment strategies* in order to respond to risks and to protect themselves from shocks. Risk
management strategies are not limited to the household level. They stretch from the in-
dividual to the global level; from small cash savings at home, earmarked for emergency
cases, to community-built dams for flood prevention, insurance schemes against a vari-
ety of risks and vaccination programs to prevent communicable diseases, and to global
institutions for economic stability or the global initiative to fight HIV/AIDS. All these
strategies aim to reduce insecurity, uncertainty and vulnerability to shocks.

Poor households not only face higher risk exposure to a wider array of risks than
wealthier households, but the capacity to cope with risks and the availability of risk
management strategies is much lower.[2] Among poor or near-poor households, risks
have a higher impact, because they can lead to (reinforcing) poverty and a dramati-
cally reduced standard of living. These dynamics are frequently described by the terms
vicious cycle of poverty or *deprivation trap* explaining the mutually reinforcing inter-
play between poverty, vulnerability, physical weakness, powerlessness and isolation.[3]
Insufficient response to risks is moving households into or deeper into poverty, thus
keeping the household in the deprivation trap. Making risk management capacities a
central consideration is essential for escaping the trap.

Health risks are more likely to cause a deprivation trap than other types of risks.
First, unlike many other risks which may affect only a certain, often clearly defined,
sub-group, health risks have the potential to affect every individual. The aforemen-
tioned double-burden of health risks explains why health risks are a main cause for
falling into the deprivation trap. Poverty causes a poor health status, which increases
health care needs and treatment costs that may lead to further impoverishment or may
drop the household below the poverty line.[4] If the household decides to forgo treat-
ment due to unaffordability or inaccessibility of health care services, the health status
is likely to worsen. Thus, foregone treatment or the unavailability of acceptable quality
health care intensifies households' ill health and often results in long-term or a perma-
nently reduced income-earning capacity.[5]

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[2] Ibid., p. 135.
[3] Swanepoel, Hennie; Beer, Frik De (2006): Community Development: Breaking the Cycle of
     Poverty, 4 edition. Juta and Company Ltd. Lansdowne, South Africa, p. 4f.
[4] Leive, Adam; Xu, Ke (2008): Coping with Out-of-Pocket Health Payments. Empirical Evidence
     from 15 African Countries. In: Bulletin of the World Health Organization, vol. 86, nr. 11, pp. 849–
     856.
[5] Dodd, Rebecca; Munck, Lise (2002): Dying for Change. Poor People's Experience of Health and Ill-
     Health. URL: http://www.worldbank.org/poverty/voices/reports/dying/ (accessed 2014/08/02);
     Meessen, Bruno; Zhenzhong, Zhang; Van Damme, Wim; et al. (2003): Iatrogenic Poverty. In: Tropi-
     cal Medicine and International Health, vol. 8, nr. 7.

There is little doubt that the chronically poor are dependent on social assistance in order to manage (some of) their risks, as their capacity for self-help is generally low. On the other hand, the large group of transitory poor are the ones that, if hit by shocks or calamities, may drop below the official poverty line.[6] The transitory poor may have productive self-help capabilities and a successful set of risk management strategies that could remove them from poverty or that could make them resilient enough not to face a severe or permanent drop due to the shock.[7] Supporting the effectiveness of risk management strategies can be an effective tool to reduce the overall vulnerability of these households and is a "necessary investment for achieving sustainable and equitable economic growth"[8].[9]

The risk management capacities of households depend not only on their economic situation, but also depend heavily on the social, political and institutional environment at the local, regional, national and global levels. Those living in developing countries are not only exposed to more risks, but they are also more vulnerable, as they have limited access to risk management strategies on a systemic level (e.g. credit or insurance). Due to the unavailability or inaccessibility of certain risk management strategies for households in developing countries, protection from major risks is frequently insufficient and their own risk management capacities are overwhelmed, if strategies at a higher level (local, national or global) turn out to be inadequate.

The analysis of this study is based on a framework proposed by Holzmann and Jørgensen as an approach to analyze risk management capacities of households in their social and political environment. The core of the *Social Risk Management* (SRM) framework is a classification of all kinds of strategies that enable households to manage their income risks and that distinguishes between risk reduction, risk mitigation (proactive) and risk-coping (reactive) strategies.[10] For the purpose of this study, the framework was extended in several ways, incorporating later developments and criticisms of the

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[6]   cp. Waelkens, Maria-Pia; Criel, Bart; Soors, Werner (2005): The Role of Social Health Protection in Reducing Poverty. The Case of Africa. International Labour Organization. Geneva, p. 15. URL: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=703561 (accessed 2009/08/31).

[7]   cp. Baulch, Bob; Hoddinott, John (2000): Economic Mobility and Poverty Dynamics in Developing Countries. In: Journal of Development Studies, vol. 36, nr. 6, p. 18.

[8]   Holzmann, Robert; Kozel, Valerie (2007): The Role of Social Risk Management in Development. A World Bank View. In: IDS Bulletin, vol. 38, nr. 3, p. 8.

[9]   Rösner, Hans Jürgen (2013): Mikrofinanzsystementwicklung und produktive Selbsthilfe. In: Ihne, Hartmut (ed.): Einführung in die Entwicklungspolitik. Münster, p. 309; Holzmann et al. (2007): The Role of Social Risk Management in Development, p. 8.

[10] The SRM framework was developed with the aim to rethink the Social Protection Sector Strategy of the World Bank, see Holzmann, Robert; Jørgensen, Steen L. (1999): Social Protection as Social Risk Management. Conceptual Underpinnings for the Social Protection Sector Strategy Paper. In: Social Protection Discussion Paper Series, vol. 9904.

original concept. The extended framework helps to systematically analyze SRM strategies that are applied by households and are accessible to them.

The management of health risks requires SRM strategies on multiple levels from the individual to the global level. Proper management of health risks requires a functioning health care system on all levels, which guarantees the provision of a financially and geographically accessible medical infrastructure for all households, with prevention policies and structures to respond to unforeseen changes in epidemiological patterns.[11] In developing countries, health care (financing) systems often function poorly and favor formal sector employees. Often, poor households, and those working in the informal sector, have only restricted access to proper health care. Similarly, health care financing systems are weak, so that individuals and households are not sufficiently protected from catastrophic health care costs. If access to health care is not provided for free, health insurance plays a pivotal role in successfully protecting households from high health care costs. Health care costs show severe fluctuations that may exceed individuals' or households' risk management capacities. Pooling health risks over a large number of people, which is the basic principle behind health insurance, is seen as an effective and recommended risk management strategy for health risks.[12]

Although the role of social risk management in social protection is widely accepted, exposure to risks, the actual use of social risk management strategies, the sequence of their application, the dependency of social risk management on the institutional setting, and limitations on access to social risk management strategies in developing countries have been empirically tested an astonishingly small number of times. A wide range of literature exists on the topic, but most studies on social risk management strategies have several limitations: The main body of publications was produced in the form of assessments, studies or reports closely linked to project implementation or linked to development agencies.[13] Sometimes these studies do not entirely follow aca-

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[11]   cp. WHO (2000): World Health Report 2000. Health Systems. Improving Performance. World Health Organisation. Geneva, p. 25.

[12]   Meessen et al. (2003): Iatrogenic Poverty, p. 582; Kawabata, Kei; Xu, Ke; Carrin, Guy (2002): Preventing Impoverishment through Protection against Catastrophic Health Expenditure. In: Bulletin of the World Health Organization, vol. 80, nr. 8, p. 612.

[13]   See for example: Flory, Jeffrey; Nagarajan, Geetha (2009): The Poor and Their Management of Shocks. Financial Services Assessment Project. IRIS Center. College Park, MD; The World Bank (2007): Malawi Poverty and Vulnerability Assessment. Full Report. World Bank. Washington, D. C. URL: http://documents.worldbank.org/curated/en/2007/12/9 905 930/malawi-poverty-vulnerability-assessment-investing-future-vol-2-3-full-report (accessed 2014/08/13); Example for purposive sampling of clusters: Devereux, Stephen (1999): 'Making Less Last Longer'. Informal Safety Nets in Malawi. IDS Discussion Paper. Institute of Development Studies. no place. URL: http://www.eldis.org/vfile/upload/1/document/0708/DOC7793.pdf (accessed 2014/04/06); Waelkens et al. (2005): The Role of Social Health Protection in Reducing Poverty.

demic standards and the application of rigorous research methods. Other studies narrow their perspective to one kind of risk, such as health, drought or natural disaster risks.[14] Some older studies on risk coping do not incorporate the SRM framework, but use earlier typologies or classifications; this is sometimes problematic when these studies also have a narrower scope than the SRM framework, e.g. focusing on reactive coping strategies and neglecting proactive strategies.[15] Almost all studies focus on only one country, which does not give a holistic and in-depth picture of social risk management as different study designs make meaningful country comparisons impossible.

This study is based on the data from an international household survey, allowing for a comprehensive analysis of social risk management strategies by households and individuals between Ghana and Malawi, as the same research instruments were used in both countries. The comparison follows the logic of the 'most similar case design,' which seeks cases that are similar in a variety of aspects, but have significant differences in variables of interest that shape patterns of behavior.[16] Ghana and Malawi were selected for the comparison of individual and household risk exposure to general risks and health risks, as well as related social risk management strategies. These two countries are suitable for the comparison of social risk management strategies as they share a variety of factors and differ in certain factors of interest. Both countries are located in the Sub-Saharan African region, have a history of British colonialism, are predominantly rural and rely on agricultural production. They have functioning democracies with the experience of a peaceful change of government. Both countries are not exposed to violent conflicts and riots, wars or large natural/environmental disasters, besides seasonal disasters such as drought, floods and fire. Ghana and Malawi are quite stable in terms of their ethnic composition and without major ethnic conflicts.

However, both countries differ in some important aspects relevant for the comparison of social risk management strategies. There are significant differences in terms of history and the institutional arrangement of the health care financing systems. While

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[14] See for example: Sauerborn, R.; Adams, A.; Hien, M. (1996): Household Strategies to Cope with the Economic Costs of Illness. In: Social Science & Medicine, vol. 43, nr. 3, p. 293ff.; Keil, Alwin; Zeller, Manfred; Wida, Anastasia; et al. (2008): What Determines Farmers' Resilience towards ENSO-Related Drought? An Empirical Assessment in Central Sulawesi, Indonesia. In: Climatic Change, vol. 86, nr. 3-4.

[15] See for example: Montgomery, Richard (1996): Disciplining or Protecting the Poor? Avoiding the Social Costs of Peer Pressure in Micro-Credit Schemes. In: Journal of International Development, vol. 8, nr. 2, p. 292f.; Sommerfeld, Johannes; Sanon, Mamadou; Kouyate, Bocar A.; et al. (2002): Informal Risk-Sharing Arrangements (IRSAs) in Rural Burkina Faso. Lessons for the Development of Community-Based Insurance (CBI). In: International Journal of Health Planning and Management, vol. 17, nr. 2, p. 153ff.

[16] Meckstroth, Theodore W. (1975): I. 'Most Different Systems' and 'Most Similar Systems' A Study in the Logic of Comparative Inquiry. In: Comparative Political Studies, vol. 8, nr. 2, p. 133.

Ghana has implemented a National Health Insurance Scheme (NHIS) in 2003 that aims to include people working in the informal economy and aims to cover a wide variety of services, Malawi continues to rely on a tax- and donor-financed health care system which aims to provide basic services for free, in the so-called Essential Health Package (EHP). It is expected that SRM strategies of individuals and households are heavily influenced by the institutional environment. Notwithstanding the suitability of Ghana and Malawi for the comparison of SRM strategies, it needs to be noted that there are other differences between the countries that might influence SRM behavior, and therefore need to be considered in the analysis. For example, Ghana has a significantly higher economic production, ranks somewhat higher in the Human Development Index (HDI) and suffers much less from the HIV/AIDS pandemic than Malawi. Also, the culture and cultural heritages show differences likely to influence SRM-related behavior.

This study compares exposure to a variety of risks, with an explicit focus on health risks, and the related risk management strategies of individuals and households in Ghana and Malawi. The analysis allows for insights into the relationship of SRM strategies with a variety of external and household-internal factors. It enables us to understand the application of SRM strategies dependent on the level of risk exposure and to observe the sequence of the application of SRM strategies in relationship to increasing severity of a shock. The comparison between Ghana and Malawi allows for more generalized conclusions, as systemic differences in SRM become clearer, similarities of risk behavior of low-income households can be extracted and effects of institutional differences can be identified. The comparative method allows explaining and interpreting the differences in proactive and reactive social risk management behavior, not only between different groups and dependent on different determinants within a country, but also understanding what SRM behavior is triggered by systemic differences between the countries.[17]

In this study, health insurance is acknowledged as a significant SRM strategy to mitigate health shocks; health insurance is recommended by many researchers as its risk pooling mechanism has certain strengths that most other SRM strategies lack.[18] For this reason, a considerable part of the analysis is devoted to analyzing the relevance of

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[17] For the rationale of country comparisons, see: Sartori, Giovanni (1991): Comparing and Miscomparing. In: Journal of Theoretical Politics, vol. 3, nr. 3, p. 244ff.

[18] Hsiao, William; Shaw, Paul (eds.) (2007): Social Health Insurance for Developing Nations. WBI Development Studies. The World Bank. Washington, D.C., p. 1. URL: http://www.hsph.harvard.edu/phcf/publications/Hsiao.Shaw.2007.SHI.developing.countries.1.2.pdf; Meessen, Bruno; Criel, Bart; Kegels, Guy (2002): Formal Pooling of Health Risks in Sub-Saharan Africa. Reflections on the Obstacles Encountered. In: International Social Security Review, vol. 55, nr. 2, p. 582f.

health insurance as an SRM strategy. However, conceptually, health insurance will be treated as just one of many SRM strategies for health risks. Applying such a holistic perspective on social health risk management strategies allows for better understanding of positioning the strategy *health insurance* in their use by individuals and households, in relationship to other SRM strategies (such as savings, credit, social capital, etc.), as well as public health care provision.

1.2. Research questions

The main interest of this study is to empirically evaluate the use and application of strategies, by individuals and households, to manage risks and cope with shocks. A particular emphasis is placed on health risks. The comparison of Ghana and Malawi allows for the evaluation of the relevance of health insurance, commonly seen as the main tool to cope with health care costs, as a social risk management strategy. Generally, there has been little research done concerning the way individuals and households use their wide array of SRM strategies and how these households build up their sets of SRM strategies depending on a variety of factors. This study aims to fill this knowledge gap with an empirical evaluation based on household survey data.

Other studies indicate that SRM strategies depend on a variety of socio-economic and geographic factors, as well as system configurations from a micro to a global level. The applied social risk management strategies and the complexity of the sets of SRM strategies were analyzed. The sequence of the application of proactive and reactive strategies by households in relationship to the severity of the shock(s) deserves a particular focus. The main research interest of this study centers on individuals and households that have a high exposure to general risks and/or health risks. Due to the higher risk exposure, these households are more vulnerable than others and need to rely on effective social risk management strategies. Therefore, these households are assumed to behave differently from other households with regard to social risk management. The main research question addresses this complex relationship:

> *In what ways is high risk exposure related to the application of social risk management strategies by households and individuals in developing countries?*

Fully addressing this main research question leads to five sub-questions that are being subsequently addressed in the main analysis and discussion of the study:

1. *What social (health) risk management strategies are applied by households and in what sequence and complexity are they applied?*

2. *In what ways are exposure to high general and high health risks associated with the application of particular sets of social risk management strategies by households?*

3. *What is the level of exposure of individuals and households to high general risks and high health risks?*

The fourth and fifth research sub-questions focus explicitly on health insurance as an SRM strategy. The fourth question elaborates on the significant differences in health risk management between households who have health insurance coverage and those who do not. This difference is triangulated using the country comparison of Ghana and Malawi, as Ghana already offers a national health insurance scheme, called NHIS. The fifth question differs from the previous ones as it introduces a forward looking aspect, by analyzing a hypothetical health insurance product and its relation to households' risk exposure and the application of other SRM strategies. The fifth sub-question therefore concludes the analysis:

4. *In what ways does health insurance coverage relate to households' application of other SRM strategies?*

5. *What does high risk exposure, in combination with existing SRM strategies of households, imply for the demand for health insurance as an SRM strategy, by assessing households' willingness to pay for a hypothetical health insurance product?*

In the empirical sections of this study, the research sub-questions will be addressed one after another in order to be able to subsequently and thoroughly answer the main research question.

1.3. Methods

The study combines a literature review on several key concepts and their adaptation to the study, with a quantitative analysis of household survey data. The review of literature focuses on the concepts of risks and health risks, including a discussion of high direct and indirect health care costs, the social risk management framework, key aspects of health care financing in low- and middle income countries, micro health insurance as a social risk management strategy and measuring demand for health insurance via a willingness to pay analysis.

The literature review centers on the framework of social risk management and its further development, as well as its criticism. The framework has been substantially extended and adapted to health risks, as well as the context of Sub-Saharan Africa.

Households exposed to high risks or high costs are expected to behave differently from other households. Hence, mechanisms have been developed to identify high-cost and particularly high-risk households, evaluating a variety of sources including literature on risk adjustment mechanisms of health insurance schemes in competitive health insurance markets. A second step focuses on the empirical evidence of these concepts in Ghana and Malawi and the operationalization of the concepts for data analysis.

Data from an international comparative household survey conducted in Ghana and Malawi is the basis of the multi-faceted comprehensive quantitative analysis. The household survey was designed and conducted by the author, who worked on all aspects of the study as project coordinator for the project Pro-MHI-Africa, together with colleagues from the University of Cologne and project partners from the University of Ghana, University of Malawi and University of Botswana. The cross-sectional household survey was conducted in Ghana, Malawi and Botswana from the 8th of March until the 5th of May 2009. This study uses the data from Ghana and Malawi in order to allow for a two-country comparison based on a most similar case design.[19] Both countries show larger inter-regional differences than international differences on many aspects and variables. In terms of health risk management, the countries substantially differ, particularly since Ghana introduced the National Health Insurance Scheme (NHIS) aimed to be the main social risk management strategy to avoid high health care costs and improve access to health care.

A total of 1428 households were interviewed in these two countries, 600 in Ghana and 828 in Malawi. Information on 7088 individuals was recorded from these households, 3088 in Ghana and 4000 in Malawi. The data are two-level data with information at the household level and core sections on health care utilization at the individual level. Analysis is conducted with the statistical software Stata 13.1[20] applying a variety of univariate, bivariate and multivariate statistical techniques on individual and household levels.

1.4. Structure of the study

The first part of the study (sections 2 and 3) elaborates on the theoretical background for further analysis, based on a thorough literature review. In these sections, the main

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[19]   The data of the sub-survey in Botswana were not included in this study for several reasons, particularly due to the status of Botswana as a middle income country in contrast to Ghana and Malawi as low-income countries, differences in the sample design and a much smaller overall sample that did not allow for meaningful statistical analyses on subgroups with a small frequency like people with chronic conditions and high-risk households.

[20]   StataCorp (2013): Stata Statistical Software. StataCorp LP. College Station, TX.

concepts of the study are further established, refined and adapted for the country set-ting and analysis. The constructs of risk and health risks are fundamentally important for the analysis and are discussed in detail in section 2, including an elaboration of high-risk cases and the economic burden of health risks.

The main analysis is based on the concept of social risk management (SRM) which is presented and adapted using a variety of improvements in section 3. First, the origi-nal classification of SRM strategies developed by Holzmann and Jørgensen[21] in 1999 is introduced and more recent developments of the SRM concept are outlined and criti-cally appraised. The adaptation of the SRM framework is presented in section 3.3 and the wide variety of SRM strategies (those relevant for health risks) are elaborated in section 3.4. Section 4 focuses on risks, risk exposure and social risk management in Sub-Saharan Africa, starting with an introduction to the situation in Ghana and Malawi and discussing empirical evidence of social risk management strategies in Sub-Saharan Africa.

Sections 5-7 comprise the empirical part of the study. First, the methodological background of the study is laid out in section 5, starting with a description of the quantitative household survey and the household sample in Ghana and Malawi and presenting the methods used for data analysis. The analytical framework is presented in section 6, laying the foundation for all analytical steps necessary to answer the re-search questions as posed in section 1.2 and further hypothesized in section 6.2. The variables are operationalized in section 6.3.

Section 7 contains the data analysis, which follows several steps along the central theme of the research questions and hypotheses. After presenting important descrip-tive information about the households and individuals in the sample in section 7.1, the following section 7.2 provides an in-depth analysis on the exposure of households and individuals to general risks (such as social, economic, environmental and weather risks). Section 7.3 contains an analysis of the individual and household exposure to health risks and the economic burden of illness (i.e. direct and indirect health care costs), as well as their determinants. Section 7.4 is the core of the study as it provides a thorough analysis of several SRM strategies at individual, household and community levels and the complexity of the sets of SRM strategies that households use in order to respond to risks. The analysis of determinants for the SRM strategies of households are presented. After that, a thorough analysis on the relationship of high general risk ex-posure, high health risk exposure, experience with high health care costs and SRM

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[21]   Holzmann et al. (1999): Social Protection as Social Risk Management. Conceptual Underpinnings for the Social Protection Sector Strategy Paper.

strategies is provided. Several hypotheses are tested elaborating these complex relationships and how the behavior of high-risk and high-cost households differs with regard to their SRM strategies. In section 7.5, health insurance as an SRM strategy and the determinants of the demand for health insurance are analyzed. First, the prospective view on health insurance is analyzed using households' willingness to pay (WTP) for a hypothetical health insurance product, as proxy for the demand for health insurance. After that, health insurance membership is analyzed in its relationship with risk exposure and the existence of other SRM strategies. Section 8 concludes the study with a summary of the results and addressing the research questions.

2. Risk and risk structure[22]

Like all households, low-income households are exposed to various kinds of risks, which they try to handle using complex arrays of social risk management strategies. Particularly, low-income households in developing countries are vulnerable to risks, as even minor shocks can cause severe hardship and can put the household in destitution.[23] Generally, poor households have few assets to protect themselves and have less means to respond to risks. These insights put the construct *risk* as a central focus of poverty analysis and social protection.[24]

In the following, *risk* shall be understood as the variation of the outcomes of an uncertain future event, while probabilities, based on experience values, can be assigned to this variation and the occurrence of the event itself. As some risks contain a speculative chance to win or lose, a narrow definition of *risk* strictly refers to such future events that involve a loss, in case the event occurs.[25] Throughout the study, this narrow

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[22]   This chapter is partially based on a previously published article by the author, but contains substantial changes and large parts have been rewritten: Leppert, Gerald (2012): Financing Health Care. The Role of Micro Health Insurance in Sub-Saharan Africa. In: Bloemertz, Lena; Doevenspeck, Martin; Macamo, Elisio; et al. (eds.): Risk and Africa. Multi-Disciplinary Empirical Approaches. Berlin.

[23]   Dercon, Stefan (2007): Risk, Insurance, and Poverty: A Review. In: Dercon, Stefan (ed.): Insurance against poverty, Repr. UNU-WIDER studies in development economics. Oxford Univ. Press. Oxford [a.o.], p. 9 and 28.

[24]   cp. The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I. Social Protection Strategy. World Bank. Washington, D.C., p. xi. URL: http://documents.worldbank.org/curated/en/2001/01/1047431/dynamic-risk-management-poor-developing-social-protection-strategy-africa-vol-1-2-main-report (accessed 2014/07/21).

[25]   Rösner, Hans Jürgen (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen. In: Zeitschrift für das gesamte Genossenschaftswesen, vol. Sonderheft 2008, p. 18; The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 139; Aven, Terje (2008): Risk analysis. Wiley. Chichester [a.o.], p. 17.

definition of risk was used, focusing on those risks causing negative shocks. These 'negative' risks can be distinguished by *risk characteristics* and the *source of risk*. Different risk characteristics and different sources of risk require different response strategies or interventions.[26] First, section 2.1 elaborates on risk characteristics and section 2.2 on sources of risk and at which levels these risks usually hit.

2.1. Risk characteristics and vulnerability to risks

Risk is an abstract construct and difficult to understand, particularly because all risks have a significantly random component, the causal links leading to the occurrence of risks are usually not entirely known, and shocks, which are the 'visible side' of risks, can come in very different forms. Hence, to make the concept of risk useful for social risk management analysis, it is necessary to have a closer look at the differences in risk characteristics. Four main groups of risk characteristics can be distinguished. Firstly, risks differ by *stochastic criteria*. Secondly, they differ by the *population exposed to the risk* and, hence, potentially affected. Thirdly, risks can be distinguished by the *level where the shock hits*. Fourthly, risks differ by the *extent of the shock*.[27]

Although all risks have a random nature, the *stochastic criteria* of risks significantly differ in terms of their (objective) probability and frequency,[28] the uncertainty of occurrence, and the correlation between different risks or the risk itself.

The main stochastic criterion is the *probability* of a risk, which refers to the likelihood that the risk occurs to a subject in a given time period and given background knowledge. For example, if statistics show that 5 out of 100 individuals who show certain symptoms develop the illness within one year, then the probability for an individual who has the symptoms to fall sick with that particular illness within a year is 5%. If more background information is known, such as an individual's weakened immune system, the probability increases accordingly.[29] The *frequency* of a risk is closely related to the probability, but needs to be conceptually distinguished. If a risk frequently oc-

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[26] The World Bank (2001): Social Protection Sector Strategy. From Safety Net to Springboard. World Bank. Washington D.C., p. 12. URL: http://documents.worldbank.org/curated/en/2001/01/828354/social-protection-sector-strategy-safety-net-springboard (accessed 2014/07/04).

[27] Other, slightly different categorizations of risk characteristics can be found in: Holzmann, Robert; Jørgensen, Steen (2001): Social Risk Management. A New Conceptual Framework for Social Protection, and Beyond. In: International Tax and Public Finance, vol. 8, nr. 4, p. 539; Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen, p. 20f.

[28] Contrary to objective probabilities which are a result of a thorough risk assessment, the subjective perception of probabilities differs and leads to substantial misjudgments of risk and probabilities. When using the term 'probabilities', this study refers to objective probabilities if not otherwise indicated. Zweifel, Peter; Eisen, Roland (2003): Versicherungsökonomie, 2 edition. Springer. Berlin [a.o.], p. 40f.

[29] Aven (2008): Risk analysis, p. 167f.

curs, its probability to occur at least once in a given time period is increased. Hence, there is interplay between probability and frequency of risks, depending on the time period under observation. However, not all risks can be expected to occur more than once in a lifetime, examples being an HIV infection or death. The frequency of other risks is unlikely to be higher than once in a given time period, for example risks that may only occur in a particular season of the year. Other risks can occur at a higher frequency in a given time period, such as contracting a cold, which may happen more often in a year.

Due to incomplete information, in every risk assessment there is some level of *uncertainty*. Whether and when a risk occurs to a particular individual, and what the extent of the shock will be, is in most cases uncertain.[30] An objective risk assessment may lack important data, so that the calculated probability can only approximate the real probabilities. Some risks can be largely anticipated, as they are more predictable than others; either because their likelihood significantly increases at regular intervals, shows seasonal fluctuations, or their likelihood significantly depends on a certain and known factor, such as old age, with increased illness risks, and risk of social isolation and inability to work.[31] For example, the risk of seasonal food shortages is largely predictable, particularly if it follows a mediocre harvest season. For example, in Malawi, the four months prior to the maize harvest are also called "hungry season",[32] a typically recurring risk with a high likelihood of occurrence. Other risks cannot be easily anticipated, such as infections and diseases, as they are largely random.

In many cases, risks are correlated with each other, so that the probability of occurrence is not independent. Concerning *correlation*, two forms need to be distinguished: Autocorrelation, between the same risk, and correlations between different risks.

The first form is autocorrelation of a risk, which means that the risk once occurred is more likely to occur again in the future. Such autocorrelation can result in an increase of the probability of the risk for the same individual (e.g. in the case of certain cancers or injuries of joints) or for other individuals (e.g. in the case of contagious diseases).[33] In the first case, when the likelihood is increased that the same risk repeats itself for the same individual, the risk has a recurring nature. In the latter case, the oc-

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[30]   Ibid., p. 17 and 20.
[31]   The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I, p. 2; The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 137f.
[32]   The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I, p. 11.
[33]   cp. Holzmann, Robert; Jorgensen, Steen (1999): Social Protection as Social Risk Management. Conceptual Underpinnings for the Social Protection Sector Strategy Paper. In: Journal of International Development, vol. 11, nr. 7, p. 1013.

currence of the risk for one individual has external effects for other individuals, as there is a correlation between affected subjects; a typical example is a local flu outbreak where one ill subject increases the likelihood for others in the same community. The direction of autocorrelation is not necessarily positive (i.e. leading to an increased future risk probability) as indicated in the two examples above, but can be also negative (i.e. decreasing future risk): For example, the autocorrelation of certain diseases for the same individual is negative, as is the case for measles, which is usually not contracted by the same individual again. An example for a negative autocorrelation with other individuals is when a risk occurrence of one individual sensitizes the others to be more cautious, such as in the case of a car accident while drunk. It is important to note that autocorrelation needs to be conceptually separated from the frequency of a risk as discussed above; frequency of a risk includes repeated risks due to autocorrelation, but is not limited to the case of autocorrelation.

The second type of correlation, between different risks, refers to the mechanism by which a risk has a causal relationship with another risk or triggers other risks. In this regard, it is necessary to distinguish between two cases:

Case 1: Risk A → Risk B
Risk A increases the probability of risk B and there is a causal relationship.

Case 2: Risk X → Risk Y, Risk Z
Risk X increases the probability of risk Y and risk Z. There is a causal relationship between risk X and Y and between X and Z. However, there is no causal relationship between Y and Z.

An example of the first case is that the realized risk of illness leads to the increased probability of the risk of high health care expenditures. An uncured illness may also cause negative long-term effects such as a future reduction of work ability and, finally, a reduction in income.[34]

The second case refers to the situation when a certain event triggers multiple risks, which correlate, but do not have a causal relationship with each other. These are typically referred to as "bunched risks". An example for bunched risks is a weather-related shock such as drought, which increases the probability of several risks, such as harvest failures, livestock loss and malnutrition.[35] Another example is the risk of a tsunami, in which an earthquake may cause direct damages to houses and also triggers a seismic

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[34] cp. The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 138.
[35] see with regard to the risk situation of rural population: Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen, p. 27.

wave, causing additional damages. The initiating events, the weather-related shock or the earthquake, have a causal link with the other risks, but those have no causal relationship between each other, although they occur at the same time.

It is important to note that frequently there are stochastically independently bunched risks, which refer to a lack of links or causal relationships between two or more risks that coincidentally occur at the same time and also pose a particular challenge to the risk management strategies of households.

Risks that correlate with each other, or occur either at the same time or after each other, are "typically difficult to handle through informal means"[36]. Such bunched or repeated shocks pose a particular problem for poor households, since assets and other risk coping and risk mitigation strategies may already be depleted leaving the household unable to respond to subsequent shocks. There is evidence that "households are more likely to bounce back from a single shock than from repeated income shocks".[37]

The *population exposed to a risk* is the main differentiating factor in risk analysis. In this regard, risks are distinguished between universal risks, categorical risks and life-cycle risks. Universal risks are those that generally affect all members of society, independent of factors like age, gender, and position in society or other dominant characteristics. With regard to universal risks, the probability of risk occurrence may still significantly vary between individuals, but universal risks lack factors that exclude general risk exposure for a particular group of people. Other than universal risks, exposure to *categorical risks* is (mostly) restricted to certain groups in society. For example, gender is an important determinant for many illness-related risks, which are restricted to men or women. Also, certain occupational groups are exposed to risks that other individuals are not exposed to, for example, mining-related lung diseases. *Life-cycle risks* are those that individuals are typically exposed to only at a certain age or part of life. An example is Alzheimer's disease due to old age infirmity.[38]

Risks can be distinguished by the *level at which the shock hits* the population. *Common* (or aggregate) risks affect a whole village or community (meso-level), region, nation or on an international level (macro-level).[39] Macro-level risks, such as war, policy

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[36] Holzmann et al. (1999): Social protection as social risk management, p. 10.

[37] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 138 and 140.

[38] De Neubourg, Chris; Weigand, Christine (2000): Social Policy as Social Risk Management. In: Innovation. The European Journal of Social Sciences, vol. 13, nr. 4, p. 408; Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen, p. 18.

[39] In the following, the term 'common risks' is used for risks that affect more than one individual or household. This study does not follow the terminology by Holzmann et al. use 'covariant' or 'covariate' as this wrongly indicates an association between the risks that affect several individuals and does not highlight the causal link resulting from the source of risk. Holzmann et al. (2001): Social Risk Management, p. 539.

shocks, and climate risks, are aggregated and noticed economy-wide. Meso-level risks simultaneously affect multiple households in a community. On the other hand, *idiosyncratic* (or individual) risks affect only specific individuals or households and have no, or only minor, impact on other households in the community.[40] Income risks, most health-related risks, risks due to aging and the risk of loss of live-stock are examples for such individual risks.[41] As Dercon (2007) pointed out, there cannot always be a clear distinction between idiosyncratic and common risks; he remarked that "even within well-defined rural communities, few risks are purely common or idiosyncratic".[42] An example is some health-related risk that cannot be categorized as an idiosyncratic risk, because it is covariate, such as infectious and communicable diseases, which may lead to higher prevalence rates in certain regions, and, in its extreme form, pandemics, such as HIV/AIDS. Additionally, HIV/AIDS poses secondary risks, such as continuous health care costs (e.g. through ART) and the burden of properly taking care of AIDS orphans.[43] Another example of a common risk is naturally occurring arsenic contaminated water, which is not passed on from one individual to another, but results from an external factor and can severely impact health. A study in Bangladesh found that entire communities were affected by arsenic contaminated water and several risk management strategies were developed by communities.[44] Generally, shocks on meso- or macro-level, and particularly "Economy-wide shocks are often the hardest for poor communities and households to cope with, especially when the shocks are repeated, deep, or persistent".[45]

The shocks resulting from a risk occurrence can take different forms; particularly the *extent of the shock* can differ, which can be expressed by the *severity* and the *duration* of the shock. The more severe the shock, in terms of scale (e.g. complete harvest loss or partial harvest failure) or duration (e.g. number of days without rainfall), the more difficult it is for the affected individual or household to cope. Generally, severity "can range from catastrophic (a natural disaster, death of the breadwinner) to minor (a

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[40] The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I, p. 2; The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 136.

[41] Holzmann et al. (2001): Social Risk Management; Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen; Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 10f.

[42] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 10.

[43] The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I, p. 9f. and 14.

[44] Lelii, Stefano (2012): Local Practices, Perceptions and Social Aspects Related to Arsenic-contaminated Water: an Ethnographic Case Study in Abhaynagar Upazila, Bangladesh (unpublished manuscript).

[45] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 10.

slight illness, a few days without work for casual laborers)".[46] While bunched or repeated shocks may aggregate the severity, single severe shocks can also exceed household's risk management capacities.[47] In a study in Indonesia, Gertler et al. (2002) reported that households were able to buffer 71% of illness costs, in the case of moderate illness shocks, but only 38% of costs in the case of severe illness shocks.[48] Generally, shocks with irreversible effects must be distinguished from those shocks that are transient. Examples for irreversible effects are injuries resulting in disability, or malnutrition after birth, which can lead to permanent cognitive and learning disadvantages.[49]

As this study focuses on social risk management, it is clear that the probability of a risk, the extent of the shock and, particularly, the impact of shocks on households, are not to be treated as exogenous factors, but as endogenous, because they are subject to social risk management strategies aimed at reducing the negative impact of risks on the household. Hence, the classification of risk characteristics in this study differs from others as it does not view the impact of a shock (and hence its severity) as part of (static) risk characteristics, but rather as the effect of successful or failing risk management strategies in response to a risk by all actors involved. Hence, a further discussion of the extent and impact of shocks on households and individuals will be done in section 3 and is in this section only briefly outlined.

However, in the context of risk management, a distinction needs to be drawn between shocks and stressors, as they require different forms of social risk management strategies. Hence, in this context, a *shock* can be understood as a major peak of pressure, on the individual or household, beyond the normal range of variability as the realization of a risk. On the other hand, *stressors* are a result of slowly and gradually increasing pressure on the household, requiring adapting capacities. Examples for stressors are degradation of soil, changing seasons and crop yields, due to climate change or a gradual decline of an industry.[50] In the following sections, this study narrows its focus on shocks as the realization of risks requiring the typical forms of (health) risk management as response. Stressors and their results, which require adaptive strategies, are occasionally mentioned.

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[46]   Ibid., p. 138.
[47]   Ibid.
[48]   Gertler, Paul; Gruber, Jonathan (2002): Insuring Consumption against Illness. In: American Economic Review, vol. 92, nr. 1, p. 67.
[49]   Holzmann et al. (2007): The Role of Social Risk Management in Development, p. 10.
[50]   cp. Turner II, B.L.; Kasperson, Roger E.; Matson, Pamela A.; et al. (2003): A Framework for Vulnerability Analysis in Sustainability Science. In: Proceedings of the National Academy of Sciences, vol. 100, nr. 14, p. 8074.

As outlined above, some risk characteristics are impacted by (comprehensive) social risk management and are, therefore, endogenous. Hence, the number of risks and the extent of exposure to shocks, as presented in the classification of risk characteristics above, cannot be established as a sufficiently analytical tool. They are an important prerequisite to understanding risk exposure, but do not capture well enough the determinants of the impact of these risks and shocks on households. The concept of *vulnerability* provides the conceptual link. In short, vulnerability to risks can be defined as the degree to which an individual or household is likely to experience harm (utility loss) due to the occurrence of risks. In the context of low-income countries, high vulnerability to poverty exists if the probability of falling into poverty over a certain time period is sufficiently high.[51] Other authors put the individual's perception about their own vulnerability status at the center of their definition, because a 'sense of insecurity' in itself reduces well-being and triggers a (negative) behavioral change in asset building and risk management.[52]

Thus, vulnerability depends on risk management capacities as well as on the exposure to risk. For example, if a household lives in an environment where it is only exposed to a few risks and has no SRM strategies in place, it can have the same degree of vulnerability as a household in a risky environment with an elaborated set of SRM strategies, at all levels from individual strategies to countrywide safety nets. Similarly, in a situation without proper means, infrastructure or precautions to combat a certain illness event, even a small negative event such as a minor infectious disease can have life-threatening effects on an individual. Hence, vulnerability and risk exposure are intertwined, but high risk exposure does not necessarily lead to high vulnerability. Therefore, Chambers (2006) defined vulnerability as a concept that has two sides, which he described as the *external side* and the *internal side*.

The *external side* refers the level of risk exposure; all risks, shocks and stressors the individual or household is exposed to. The *internal side* of vulnerability refers to the lack of strategies to pro-actively or re-actively respond to these stresses or shocks, resulting in damaging loss for the individual or household, and whether the individual or household is able to fully regain a level of well-being similar to before the shock. Generally speaking, the internal side of vulnerability refers to the lack of capacity to cope

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[51] cp. Holzmann et al. (2007): The Role of Social Risk Management in Development, p. 12; Turner II et al. (2003): A Framework for Vulnerability Analysis in Sustainability Science, p. 8074.

[52] cp. the discussion about asset thresholds and poverty traps. Carter, Michael R.; Barrett, Christopher B. (2007): Asset Thresholds and Social Protection. A 'Think-Piece'. In: IDS Bulletin, vol. 38, nr. 3, p. 34f.

with or adapt to (multiple) stresses and shocks.[53] For the individual or household, such losses can have different forms: they can be physical or psychological (health), economic, social or political.[54] Particularly difficult situations arise when high levels of external and internal vulnerability coincide. Typically, poor households in developing countries show not only a high level of external vulnerability (=risk exposure), but also a high level of internal vulnerability (= lack of effective strategies against shocks).

2.2. Sources of risk

As already mentioned in section 2, risk can originate from a wide variety of different sources, which, depending on the risk characteristics, require different response strategies and interventions. These risk sources can be categorized into six groups: They comprise *economic risks* (e.g. harvest failure, unemployment, business loss), *natural risks* (e.g. earthquake, drought, flood), *environmental risks* (e.g. degradation of soil, pollution, desertification, deforestation), *social risks* (e.g. crime, domestic violence, riots, isolation), *political risks* (e.g. war, bad governance, unstable government, corruption, discrimination of minorities), and *health risks* (e.g. disability, illness, injury, malnutrition, death). Table 1 depicts the main sources of risk. The table further distinguishes between the levels where the risk hits, which is on a continuum from the individual to the country or global level. For example, a drought is likely a *common risk* affecting all individuals and households in a region, or even hitting country-wide.

Out of all the sources of risk, particularly health, social and economic risks need to be distinguished into *common* and *idiosyncratic risks*, as they can hit on meso- and macro levels, but they can also hit on the individual or household level only. The other sources, namely natural, political and environmental risks, are generally common risks, unlikely to hit only single individuals or households. It is obvious that risks that hit on the meso or macro level pose particular difficulties for households to properly respond. In order to allow successful risk management, the most efficient level for SRM strategies is one level above the level where the risk occurs. For example, if a community is affected by harvest failure due to crop disease, the regional level would be more capable of providing certain risk mitigation or risk coping strategies than the community itself. A successful SRM strategy "requires pooling with areas not subject to the risk".[55]

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[53] Chambers, Robert (2006): Vulnerability, Coping and Policy (Editorial Introduction). In: IDS Bulletin, vol. 37, nr. 4, p. 33; Watts, Michael J.; Bohle, Hans G. (1993): The Space of Vulnerability. The Causal Structure of Hunger and Famine. In: Progress in Human Geography, vol. 17, nr. 1, p. 45f.

[54] cp. Chambers (2006): Vulnerability, Coping and Policy (Editorial Introduction), p. 33.

[55] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 136.

Tab. 1: Sources of risk and level of occurrence

Source of risks	Idiosyncratic	Common	
	Risk affecting an individual or household (micro)	Risks affecting groups of households or communities (meso)	Risks affecting regions, nations or global risks (macro)
Natural		Rainfall Landslide	Earthquake Flood or Drought High winds
		Volcanic eruption	
Health	Illness (predom. non-communicable) Injury Disability Death	Illness (communicable)	
		Epidemic / pandemic	
Social	Domestic violence Family break-up Widowhood Social isolation	Terrorism Gang activity	Civil strife War Social upheaval
		Crime Corruption	
Economic	Business loss/failure Crop/livestock loss	Resettlement Harvest failure/ yield fluctuations Unavailability of inputs	Growth collapse Hyperinflation Balance of payments, financial- or currency crisis Technology shock Terms of trade shock Transition costs of economic reforms
		Unemployment	
		Price variability for food, inputs and commodities	
Political		Riots Ethnic conflicts	Political default on social programs Coup d'état Failed states
Environmental		Pollution Deforestation Soil degradation	Nuclear disaster Global warming

Source: Adapted with changes, from World Bank (2001): Attacking Poverty – World Development Report[56]

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[56] Ibid., p. 136f.

2.3. Health risks and exposure to health risks

2.3.1. The nature of health risks

Health risks are a particular kind of risk that deserve elevated attention in social risk management. First of all, health risks are universal, as all human beings are potentially exposed them, such as illness, injury, disability or death. Maintaining health and, particularly, retaining a good health status (when health risks have already occurred) have a very high intrinsic value (health as a value per se and as a requirement to enjoy living and derive utility from consumption) and economic value (health as requirement to be able to work and raise income). Furthermore, willingness to pay for health care services is extraordinarily high after falling sick, particularly in case of emergencies, severe or painful illnesses. In situations of illness or pain, households are even willing to accept health care expenditures reaching a catastrophic level for the household (see section 2.4 for a more thorough discussion).[57] The occurrence of health risks is uncertain and the extent is unknown. Although there is some predisposition to illnesses (either genetically or dependent on unhealthy behavior and/or environment) and certain risk factors increase predictability and probability, the risk of illness is highly randomly distributed (see subsequent section 2.3.2 for a further discussion).[58] Furthermore, different health risks can be distinguished regarding their duration and severity, as well as their probability; typically low-cost but high probability illnesses are distinguished from high-cost but low-probability illnesses. Examples for the first case are small wounds and a cold, for the second case are illnesses, such as heart infarction or brain tumor.[59]

As table 1 on the level of risk occurrence shows, many health risks are idiosyncratic risks hitting on the individual- or household-level. Particularly, this includes all noncommunicable diseases, as well as injuries and disabilities that cannot be transmitted between individuals. On the other hand, communicable diseases may be restricted to the individual- or household-level (idiosyncratic), but for many illnesses (e.g. contagious diseases) the likelihood is high that the disease may also affect other individuals and households (meso-level). For example, some infectious diseases that are not trans-

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[57] Breyer, Friedrich; Kifmann, Mathias; Zweifel, Peter (2005): Gesundheitsökonomik, 5th revised edition. Springer. Berlin [a.o.], p. 1; Russell, Steven (1996): Ability to Pay for Health Care. Concepts and Evidence. In: Health Policy Planning, vol. 11, nr. 3, p. 229f.

[58] Smith, Peter C.; Witter, Sophie N. (2004): Risk Pooling in Health Care Financing. The Implications for Health System Performance. HNP Discussion Papers. World Bank. Washington D.C., p. 1. URL: http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/281627-1095698140167/Chap9SmithWitterRiskPoolingFinal.pdf (accessed 2011/10/01).

[59] Dror, David M.; Jacquier, Christian (1999): Micro-Insurance. Extending Health Insurance to the Excluded. In: International Social Security Review, vol. 52, nr. 1, p. 11.

mitted between humans, such as tetanus, are classified as idiosyncratic risks. Good examples for (auto)correlated risks are a local flu epidemic, where the same type of disease is contracted from one to another, or diarrheal diseases contracted from a contaminated community water source. Illnesses that spread beyond a community or group of households are local or even regional or national epidemics. Epidemics are usually infectious diseases that show epidemiological patterns, with more disease cases than usually expected in a certain population. Although the majority of diseases perceived as 'epidemic' are infectious, some non-infectious diseases have also been classified as such by some authors, such as smoking-related illnesses. The difference between an epidemic and a pandemic is mostly the geographic spread defining the pandemic as a worldwide epidemic.[60]

In Sub-Saharan Africa, the HIV/AIDS pandemic had a dramatic impact on the affected countries. This is particularly the case in the Southern African countries, including Malawi, but also in West Central Africa, for example in Cameroon or Gabon, where the HIV/AIDS epidemic has hit society and the economy heavily, with a prevalence rate among adults higher than 10 percent.[61] This resulted in an enormous burden of disease, an increased number of deaths and, ultimately, a reduced overall life-expectancy, as well as a drop in the countries' economies.[62]

What makes health risks more critical for SRM interventions is that poor households are particularly exposed to health risks. The living and working conditions of poor households often result in higher probability of illness and injury. Under-nutrition or malnutrition results in physical weakness. Further, physical weakness as a result of "malnourishment and previous sickness tending to reduce resistance to disease and to slow recovery"[63] leads to further sicknesses and future vulnerability. Therefore, poor households are more affected by communicable diseases compared to wealthier households.[64] Furthermore, poor households are more vulnerable to the impact of health risks (or any other risk) than other households, because any drop in income or an increase in expenditures can make them destitute. In rural tropical conditions, the confluence of hard agricultural work, high risk of infection, food shortages and difficult road conditions in the rainy season put additional risk on the households.[65] These experiences of poor households lead to a generally high level of risk aversion; the

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[60]   Breslow, Lester (2002): Encyclopedia of Public Health, 1 edition. Gacl. New York, p. 394.
[61]   Joint United Nations Programme on HIV/AIDS (2008): Report on the Global HIV/AIDS Epidemic 2008. Joint United Nations Programme on HIV/AIDS. Geneva, p. 39.
[62]   The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 138f.
[63]   Chambers (2006): Vulnerability, Coping and Policy (Editorial Introduction), p. 37.
[64]   The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 137.
[65]   Chambers (2006): Vulnerability, Coping and Policy (Editorial Introduction), p. 37.

knowledge that a small drop can have heavy negative impact on the household and its members, alters behavior and may result in low risk production, low investments and avoidance of any form of risky behavior.[66]

2.3.2. High-risk cases

As already mentioned in the previous section, the majority of health care costs is randomly distributed. Nevertheless, a significant share of future health care costs and health care needs can be predicted based on information of individuals. Certain risk factors lead to an increased probability that an individual will require treatment and cause above average health care costs. These risk factors not only increase the probability of future health care costs, but also influence the behavior of those experiencing an increased health risk. Therefore, it is hypothesized that the existence of such risk factors in individuals and households changes their risk behavior and the application of social health risk management strategies. These factors are operationalized by forming high-risk groups in the empirical part of this study in section 6.3.

In order to predict future health care costs, these risk factors must be ex-ante identifiable.[67] They can be roughly categorized in (1) socio-demographic factors such as age, gender, income or education, in (2) information about extent and costs of health care utilization in previous periods, e.g. high treatment episodes, high health care costs and drug prescriptions, as well as costs due to longer hospitalization stays, in (3) diagnosis-based information, which needs to be distinguished between (3a) genetic predisposition or congenital illnesses and (3b) chronic or permanent illnesses,[68] (4) regional or geographic differences, for example households in endemic areas or environmental- or climate-related health problems, and (5) individual characteristics such as (5a) the perceived subjective health status or (5b) life-style dependent health risks.[69] Although a

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[66] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 138.

[67] For the purpose of retrospective risk adjustment mechanisms, additional ex-post risk factors can be taken into consideration. For example, it is known that individuals cause high health care costs in the months prior to death. This allows a retrospective compensation of a health insurance scheme for such additional costs.

[68] Depending on the source, chronic conditions are either defined after the duration of the illness (e.g. a duration longer than three months) or based on the diagnosis of a chronic (non-communicable) disease such as diabetes, arthritis, cardiovascular diseases, etc. Cp. Morewitz, Stephen John (2010): Chronic diseases and health care: new trends in diabetes, arthritis, osteoporosis, fibromyalgia, low back pain, cardiovascular disease, and cancer. Springer. New York, p. 1ff.; Wang, Qun; Brenner, Stephan; Leppert, Gerald; et al. (2014): Health Seeking Behavior and the Related Household Out-of-Pocket Expenditure for Chronic Non-Communicable Diseases in Rural Malawi. In: Health Policy and Planning, p. 2f.

[69] The list by Breyer et al. has been adapted for the context of developing countries and this study. For example, the risk factors 'behaviour on changing health insurance schemes' and 'mortality' (an ex-post risk factor) have been left out. Some other adjustments were made. Cp. Breyer et al.

variety of risk factors have been discussed in academia, Breyer et al. (2005) concluded that the largest part of the variance of health care expenditures cannot generally be predicted.[70] Applying available real-life data, researchers concluded that about 20% of systematic predictability of individual health care costs may be realistic as a lower bound of R^2 in risk adjustment models. With inclusion of further individual information, it could be expected that the predictability increases only slightly. Generally, outpatient care could be better predicted than inpatient care.[71]

The first category of *socio-demographic factors* consists of easily available and identifiable variables such as sex, age, and education, as well as income or wealth variables. The variable sex is significantly predictive of health care costs. However, the influence of the variable sex heavily depends on the age of the subject. Empirical studies in the Netherlands (1995) and the USA (1992-1993) showed that sex had no significant influence on health care costs until the age of 15. However, in the age group 15-50, women showed higher health care costs than men. This relationship reversed for the age group above 50 years, showing higher health care costs among men. However, such results depended heavily on the sample of the study, because, for example, a study among insured in the US-American Medicaid scheme (1991-1992) showed higher health care costs for men among all adult age groups.[72] The risk factor age showed a more linear pattern, as there was a clear relationship between age and chronic health conditions.[73] Except for the 0-4 year old children (who showed relatively higher health care costs than the next age group), health care costs increased continuously with older age. An empirical study in the USA (1991-1992) showed that the age group of 60-64 years resulted in health care costs being approximately ten times higher than the age group 5-9 years. Other studies also found a significant relationship between age and health care costs, although less strong: The aforementioned study in the Netherlands (1995) showed health care costs for the age group 60-64 years old over three times higher and for the group 85-89 years old over 8-times higher than the group 5-9 years old.[74]

The second group of risk factors consist of *information about extent and costs of health care utilization in previous time periods.* Variables such as high treatment utiliza-

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(2005): Gesundheitsökonomik, p. 300ff.

[70]   Ibid., p. 303.

[71]   van Vliet, René C.J.A. (1992): Predictability of Individual Health Care Expenditures. In: The Journal of Risk and Insurance, vol. 59, nr. 3, p. 453; van de Ven, Wynand P.M.M.; Ellis, Randall P. (2000): Risk Adjustment in Competitive Health Plan Markets. In: Culyer, Anthony J.; Newhouse, Joseph P. (eds.): Handbook of Health Economics, vol. Part 3. Ch. 14, Volume 1a. Elsevier Science B. V. Amsterdam (a.o.), p. 791f.

[72]   van de Ven et al. (2000): Risk Adjustment in Competitive Health Plan Markets, p. 794ff.

[73]   van Vliet (1992): Predictability of Individual Health Care Expenditures, p. 453.

[74]   van de Ven et al. (2000): Risk Adjustment in Competitive Health Plan Markets, p. 795f.

tion episodes, high health care costs and previous drug prescriptions, as well as longer hospitalization stays in the previous year, are a better predictor for future health care costs than socio-demographic factors. The predicted variance, R^2, could be expected to be quite high, in the range of 0.06 to 0.1,[75] although the data from existing studies usually included expenses that were covered by health insurance, but lacked other private expenses, as well as diagnostic information. Costs and utilization of all treatment events, of outpatient treatment, of inpatient treatment (particularly longer hospital stays) and medication can be relevant factors predictive of future health care costs; these variables can be used as dummy variables if the prior extent of utilization and/or costs exceeds a certain threshold.[76]

The third category of *diagnosis-based information* has received extensive research, particularly in North-America and Europe, on the question, how competitive health insurance markets could be regulated in order to avoid risk selection by health insurance schemes. In many cases, diagnosis-based factors showed better predictive power compared to information on the utilization during previous time periods. For example, Ash et al. (2001) found that diagnostic groups, based on the Diagnostic Cost Groups and Hierarchical Condition Categories (DCG/HCC), were slightly superior to models using prior health care expenditures.[77] Diagnosis-based models were particularly strong for permanent and chronic conditions. Disability and functional impairment were relatively good predictors of future health care costs, leading to roughly doubled health care costs compared to other groups.[78] Several chronic conditions have proven to be a good predictor of high future health care costs. Among these were chronic respiratory diseases (e.g. asthma or chronic lung diseases), chronic cardio-vascular diseases (e.g. hypertension or stroke), diabetes type II, cancer (e.g. lung cancer, colorectal cancer and breast cancer) and other chronic diseases (such as cystic fibrosis, depression or arthritis), but also HIV/AIDS and its opportunistic diseases.[79] The South African risk adjustment mechanism, for example, listed 25 chronic diseases which result in predictably higher health care costs in future periods.[80] For complex risk adjustment mechanisms,

[75] Ibid., p. 797.

[76] Spycher, Stefan (2002): Risikoausgleich in der Krankenversicherung: Notwendigkeit, Ausgestaltung und Wirkungen. Haupt. Bern [a.o.], p. 103f. and 197.

[77] Ash, Arlene S.; Zhao, Yang; Ellis, Randall P.; et al. (2001): Finding Future High-Cost Cases. Comparing Prior Cost versus Diagnosis-Based Methods. In: Health Service Research, vol. 36, nr. 6 Pt 2, p. 201 and 203.

[78] van de Ven et al. (2000): Risk Adjustment in Competitive Health Plan Markets, p. 806.

[79] cp. Ibid., p. 811.

[80] McLeod, Heather; Grobler, Pieter (2010): Risk Equalisation and Voluntary Health Insurance. The South Africa Experience. In: Health Policy, vol. 98, nr. 1, p. 30f. and 35; The chronic diseases list include chronic cardiovascular diseases, autoimmune diseases, Mental/neurological diseases, respi-

very detailed disease categories have been developed that have predictive power for future health care costs, for example the DCG/HCC model used 781 morbidity categories that were aggregated in 184 classes.[81]

The fourth group of *regional and geographic differences* acknowledges the different epidemiological profiles of countries and within-country regions; disciplines like geographical epidemiology, medical geography and medical anthropology, focus on explaining the different level of exposure to health risks due to climate, geography and cultural patterns.[82] Besides large-scale differences between continents and countries, there are also substantial regional differences in illness patterns. For example, regional differences in health care expenditures in Germany have been studied by Göpffarth (2011). He reported that there were large differences between administrative districts and that those were largely the result of illness patterns and different distributions of age and sex. Compensating for both influence patterns, the pure regional effect was rather low, with a span from the lowest to the highest per-capita expenditures from 1852-2666 € (equals +44.0%) and a standard deviation of just 98.90 €.[83] However, even in the relatively small country of Germany, the health care costs resulting from certain disease categories varied widely between administrative districts. The author attributed this to social factors, such as education and availability of health care providers.[84] In the USA, the geographic differences in health care costs (without further discussion of epidemiological differences) have been studied using Medicare data from 1996; the study identified geographic factor price variations as an important factor for the measured differences in health care costs.[85]

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ratory diseases, diabetes, endocrine disorders, chronic inflammatory diseases, renal failure and ocular disorders. Council for Medical Schemes South Africa (2014): Chronic disease list. URL: https://www.medicalschemes.com/medical_schemes_pmb/chronic_disease_list.htm (accessed 2014/04/09).

[81] Kasper, Stefanie (2002): Der Risikostrukturausgleich in der gesetzlichen Krankenversicherung, vol. 10. Schriften zur Sozialpolitik. Weiden/Regensburg, p. 73.

[82] For more information, see: Waller, Lance A; Gotway, Carol A (2004): Applied spatial statistics for public health data. Wiley-Interscience. Hoboken, NJ, pp. 1–5; Trostle, James A.; Sommerfeld, Johannes (1996): Medical Anthropology and Epidemiology. In: Annual Review of Anthropology, vol. 25; for regional and country-specific prevalence rates: WHO (2010): World Health Statistics 2010. Geneva.

[83] Goepffarth, Dirk (2011): Regionalmerkmale im Risikostrukturausgleich. Ein Beitrag zum funktionalen Wettbewerb und zu bedarfsgerechter Versorgung? In: Repschläger, Uwe; Schulte, Claudia; Osterkamp, Nicole (eds.): BARMER GEK. Gesundheitswesen aktuell 2011 - Beiträge und Analysen, p. 24.

[84] Higher health care expenditures due to education likely resulted from higher utilization patterns rather than higher morbidity. In the German case, regional differences based on household income and unemployment rate proved to be insignificant. Ibid., p. 26 and 31.

[85] van de Ven et al. (2000): Risk Adjustment in Competitive Health Plan Markets, p. 806f.

The fifth group stands out from the other four, as it refers to *individual or subjective characteristics and attitudes* such as the subjective perceived health status or life-style dependent health risks. The general perceived health status and more formalized self-assessed health criteria based on physical functions such as the 'Activities of Daily Living (ADL)' measure are predictors for future health care needs and costs.[86] Life-style dependent health risks are difficult to assess, since they include risk-taking behavior and intentions (e.g. extreme sports, unhealthy diet, unwillingness to quit smoking or other incautious behavior) which are not socially desirable and, therefore, cannot be properly assessed using questionnaires and interviews. Overall, these self-reported data seemed to be less reliable and possessed a lower predictive power than diagnosis-based models.[87]

2.4. The dual economic burden of health risks

Unlike many other risks, health risks show a dual economic risk profile, which makes them, together with the (temporary or permanent) loss of health, particularly challenging for affected individuals and households. Illness or injury of household members may cause a drop or loss of income due to the sick individual's or of the care-givers' inability to work. At the same time, the household may be facing high health care costs, adding to the economic burden. Additionally, the loss of health itself puts (non-financial) pressure on the household, particularly in the case where long-term or irreversible negative health consequences are expected.[88] The random characteristic of health risks, which is particularly pronounced in the case of injuries and communicable diseases, make many health risks barely predictable. Both, the illness itself and also the payments for treatments may come unexpected. For low-income households, unforeseen high health care costs generally have the consequence of curtailing other expenditures (e.g. those planned for consumption or investment) in order to pay for treatment. Hence, health care costs strongly contrast to other costly events (e.g. school fees) that are certain, and for which the households can make long-term dispositions.[89]

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[86]   Spycher (2002): Risikoausgleich in der Krankenversicherung, p. 81f. and 67ff.
[87]   van de Ven et al. (2000): Risk Adjustment in Competitive Health Plan Markets, p. 803f.
[88]   Rösner (2013): Mikrofinanzsystementwicklung und produktive Selbsthilfe, p. 315; Breyer et al. (2005): Gesundheitsökonomik, p. 221.
[89]   Wagstaff, Adam; van Doorslaer, Eddy (2003): Catastrophe and Impoverishment in Paying for Health Care. With Applications to Vietnam 1993-1998. In: Health Economics, vol. 12, nr. 11, p. 10ff.

2.4.1. Health care costs and catastrophic health care spending

The costs of illness can be distinguished by direct and indirect costs. Direct costs generally refer to all expenditures directly related to the utilization of health care services, such as paying the doctor or the hospital (treatment), transportation of the patient to and from the doctor or hospital (transport), drugs, ointments or injections (medicines), glasses, crutches, hearing aids (medical devices) and imaging services or laboratory tests (diagnostics). Indirect costs generally refer to the loss of income, assets, or means of production due to illness. Particularly in developing countries, treatment of severe illness leads to a loss of work income due to the lost working days of the patient and, generally, also of one or more family members assisting the patient. Furthermore, illness can result in the long-term inability to work and generate income. Other factors are often counted among indirect health care costs, such as the opportunity costs of illness, the costs involved in obtaining a loan, e.g. interest rates, or selling productive assets that are then lacking in the household.[90]

The extent of direct and indirect costs and the resulting burden on households highly depend on the design of the (public) health care financing system, e.g. whether all or certain services are provided for free, whether a fee for service is applied, whether low-income groups are exempt from user fees or whether health insurance schemes pool the risks and smooth the health care expenditures. However, in most countries in Sub-Saharan Africa, public health care financing lacks the capacity to significantly reduce the financial burden of illness, particularly affecting low-income households.

The major financial burden for households originates from user fees at the point of service, so-called out-of-pocket payments, which are neither pooled between individuals nor give they households a real chance for inter-temporal pooling. Out-of-pocket payments were defined by the WHO as "[...] direct outlay of households, including gratuities and payments in kind, made to health practitioners and suppliers of pharmaceuticals, therapeutic appliances and other goods and services, whose primary intent is to contribute to the restoration or to the enhancement of the health status of individuals or population groups [...]".[91] Effects of out-of-pocket payments on health care utilization by households are well studied; they were found to have – besides the costs in-

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[90] McIntyre, Diane; Thiede, Michael; Dahlgren, Göran; et al. (2006): What Are the Economic Consequences for Households of Illness and of Paying for Health Care in Low- and Middle-Income Country Contexts? In: Social Science and Medicine, vol. 62, nr. 4, p. 856ff; Gumber, Anil (2001): Hedging the Health of the Poor. The Case for Community Financing in India. Health, Nutrition and Population (HNP) Discussion Paper. World Bank. Washington, D.C., p. 8; Asfaw, Abay; Jütting, Johannes (2002): Mutual Health Insurance (MHI). A Viable Solution to Increase Access to Health Care? An Ethiopian Case Study. Center for Development Research (ZEF). Bonn, p. 3.

curred – a strong effect among low-income households to delay seeking care, to increase self-medication and to use informal health care.[92]

The risk of falling below the poverty line (or remaining there) due to such high illness-related health care expenditures is generally measured by an indicator called catastrophic health care costs. Health care expenditures are seen as catastrophic if their extent is above a certain threshold. Ranson et al. (2003) defined this threshold as expenditures exceeding 10% of income.[93] Other authors defined catastrophic costs as these costs exceeding 40% of the income, after subtracting the expenditures for vitally important goods.[94] For low-income households, even the costs of common illnesses can exceed the threshold for catastrophic health care costs. Chronic or recurrent illnesses aggravate this situation.[95] Furthermore, the resources of low-income households are limited, so that not only high cost cases can deplete their physical capital, but also low cost treatments that are repeated over time.[96] In a study in Indonesia, Pradhan et al. (2002) confirmed that out-of-pocket spending was highly skewed and therefore "a significant fraction of the population could suffer catastrophic levels of health expenditure relative to their incomes".[97] This conclusion got even weightier, because Pradhan et al. showed that less wealthy households had lower absolute health care expenditures, likely as a result of lower health care utilization patterns, particularly of inpatient care.[98]

2.4.2. High-cost cases

Health care costs "are known to be highly concentrated, with a few people generating a large percentage of total costs in a year"[99]. Previous research by the author showed that health care costs varied considerably among ill persons. In a household survey that collected data from 4316 ill persons among low-income groups in India in 2005, a

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[91] World Health Organization (2008): Indicator definitions and metadata. URL: http://www.who.int/whosis/indicators/compendium/2008/3exo/en/ (accessed 2009/07/04).

[92] Gilson, Lucy (1997): The Lessons of User Fee Experience in Africa. In: Health Policy and Planning, vol. 12, nr. 4, p. 276.

[93] Ranson, Michael Kent (2002): Reduction of Catastrophic Health Care Expenditures by a Community-Based Health Insurance Scheme in Gujarat, India. Current Experiences and Challenges. In: Bulletin of the World Health Organization, vol. 80, nr. 8.

[94] Kawabata et al. (2002): Preventing Impoverishment through Protection against Catastrophic Health Expenditure, p. 612.

[95] Waelkens et al. (2005): The Role of Social Health Protection in Reducing Poverty, p. 4.

[96] Meessen et al. (2003): Iatrogenic Poverty, p. 581.

[97] Pradhan, Menno; Prescott, Nicholas (2002): Social Risk Management Options for Medical Care in Indonesia. In: Health Economics, vol. 11, nr. 5, p. 444.

[98] Ibid.

[99] Ash et al. (2001): Finding future high-cost cases, p. 194.

high level concentration of health care costs could be shown: Approximately 5.5% of persons with the highest direct health care expenditures in their illness episodes had to bear over 50% of overall direct health care costs in the entire risk pool.[100] If indirect costs were included, the concentration of costs was even higher, since indirect costs can become a significant part of the overall expenditures in long-term or chronic illnesses. Such expenditure patterns are similar across studies: For example, in 1984, a study observing patterns of the health care expenditures for 1666 members in an employee benefit plan in Los Angeles, USA, came to the conclusion that less than 6% of the insured individuals caused about 55% of the health care costs.[101] In US data on inpatient and ambulatory care (1997-1998), Ash et al. found that one quarter of individuals had no cost at all and the 1% of individuals having caused the highest health care costs needed 31% of all costs in the observed sample.[102] The pattern of relatively few high-cost cases also holds true in sub-populations. For example, a study by Liptak (2007) on children using the US Medical Expenditure Panel from 2000 and 2001 showed that 10% of children caused 54% of all health care costs.[103]

A comparative cross-sectional analysis by Berk et al. (2001) using health care expenditure data from the years 1987 and 1996 in the USA revealed "a remarkable stability in the concentration of expenditures over the [...] decade"[104]. The highest 5 percent of the population accounted for 55% (1996) and 56% (1987) of all health care costs, respectively. The highest one percent in 1996 still accounted for 27%, and the highest one percent in 1987 for 28%, of total health care costs. Furthermore, the lowest 50% of the population used about 3% of health care costs in both years. In that study, the majority of expenditures of the high-cost individuals could be attributed to inpatient hospital services.[105]

Future high health care costs depend on the current high health care costs only to a certain extent. In the aforementioned study by Liptak on children in the USA, the author showed that out of the 10% of cases with the highest costs, 49% remained in this

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[100] Leppert, Gerald (2012): Operating on the Edge. How to Counter Insurance-Related Financial Risks in Micro Health Insurance Beyond the Scope of a Single Organization. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa. LIT Verlag. Berlin, p. 235f.

[101] Alexandre, Leslie M. (1988): Who Are the High Cost Cases in a Health Benefits Plan? International Foundation of Employee Benefit Plans. Brookfield, Wisconsin, p. 1 and 8.

[102] Ash et al. (2001): Finding future high-cost cases, p. 198f.

[103] Liptak, G. S. (2007): Short-Term Persistence of High Health Care Costs in a Nationally Representative Sample of Children. In: Medical Benefits, vol. 24, nr. 1, p. 5.

[104] Berk, Marc L.; Monheit, Alan C. (2001): The Concentration of Health Care Expenditures, Revisited. In: Health Affairs, vol. 20, nr. 2, p. 12.

[105] Ibid., p. 12f.

high cost group; 12% dropped to the bottom half and the rest still showed above aver-age health expenditures.[106] Determinants predicting high health care costs were age, insurance status, whether children were included in the "Children With Special Health Care Needs screener" and children with functional limitations.[107] Generally, people with disabilities incur predictable and above-average comparatively high health care costs, have lower income earning capabilities, are more vulnerable for multidimen-sional poverty, and, hence, require public support.[108] For example, a study by Trupin et al. (1987), using national medical expenditures survey data in the USA, showed that the medical expenditures of individuals with activity limitations were four times larger than that of other individuals.[109]

For any population and sub-population, it is typical that a few individuals in a given time period experience excess health care expenditures. Over several time periods, these high-cost cases are not necessarily the same individuals, as the fluctuations in ex-cess health care expenditures are, to a large extent, random. However, a considerable share of high health care costs can be explained by a few variables such as illness-re-lated variables, e.g. chronic diseases or disabilities, or personal characteristics, such as age. These so-called high-risk groups were the subject of the earlier section 2.3.2, dis-cussing predictable high health care costs. These two groups – high-cost cases and high-risk cases – somewhat overlap, so that some cases can be attributed to both at the time, as they are high-risk/high-cost cases. Those households or individuals that fall into both categories at the same time more likely incur high health care expenditures with catastrophic impact on the entire household.

Performing statistical analyses with health care costs can be challenging due to their particular distribution patterns. Typically, the frequency distribution of health care costs is highly asymmetric and heavily positively right skewed with a long right (lower) tail. With such distributions, the measure of location *mode* gives the smallest value, whereas the *median* represents the middle value and the *mean* is the largest value of the three.[110] For all calculations related to such distributions, it is obvious that

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[106] Liptak (2007): Short-Term Persistence of High Health Care Costs in a Nationally Representative Sample of Children, p. 5.

[107] Ibid.

[108] Haveman, Robert; Wolfe, Barbara (no date): The Economics of Disability and Disability Policy, p. 12ff. and 33f.; Mitra, Sophie; Posarac, Aleksandra; Vick, Brandon (2013): Disability and Poverty in Developing Countries: A Multidimensional Study. In: World Development, vol. 41, p. 11.

[109] Trupin, Laura; Others, And (1995): Medical Expenditures for People with Disabilities in the United States, 1987. Disability Statistics Report 5. U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20 402-9328. Washington D.C., p. 8.

[110] Chernick, Michael R.; Friis, Robert H. (2003): Introductory Biostatistics for the Health Sciences: Modern Applications Including Bootstrap, 1 edition. Wiley-Interscience. Hoboken, NJ, p. 75f.

the arithmetic mean alone is an insufficient measure and is prone to false interpretation, because extreme values have too strong an influence on the mean; the median or the α-trimmed mean are better measures for the description of such variables (see also section 5.3).[111]

3. Social risk management[112]

3.1. The social risk management framework

Social risk management (SRM) is a conceptual framework for social protection measures, developed by Holzmann and Jørgensen for the Social Protection Unit at The World Bank in 1999.[113] The concept was built upon the insight that the focus of social protection needs to be moved from traditional measures of social protection (e.g. social assistance and labor market interventions) to measures and interventions enabling individuals, households and communities to apply better risk management tools and, therefore, to reduce their income risks and vulnerability.[114] The motivation of Holzmann and Jørgensen for the development of the social risk management approach was their fundamental criticism of the traditional view on social protection in development practice that did not sufficiently address vulnerability as an aspect of the multidimensional concept of poverty. In their eyes, development cooperation's actions were too strongly focused on reactive and ex-post strategies.[115] Their aim was to lay the foundation for a complete rethinking of social protection strategies at major development agencies, most notably The World Bank.

Two major conceptual developments that had started in the 1980s strongly influenced the development of the SRM framework: The concept of vulnerability and the newly perceived pivotal importance of social protection. Since the beginning of the 1980s, the concept of vulnerability had been increasingly discussed in the development

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[111] Wilcox, Rand R. (2010): Fundamentals of Modern Statistical Methods - Substantially Improving Power and Accuracy, 2 edition. Springer. New York [a.o.], p. 136.

[112] This chapter is partially based on a previously published article by the author, but contains substantial changes and large parts have been rewritten: Leppert (2012): Financing Health Care. The Role of Micro Health Insurance in Sub-Saharan Africa.

[113] Holzmann et al. (1999): Social Protection as Social Risk Management. Conceptual Underpinnings for the Social Protection Sector Strategy Paper; The original article was later republished in the Journal of International Development: Holzmann et al. (1999): Social protection as social risk management.

[114] Holzmann et al. (1999): Social Protection as Social Risk Management. Conceptual Underpinnings for the Social Protection Sector Strategy Paper, p. 4 and 5.

[115] Ibid., p. 23.

context and at the latest, in 2000, it had become an integral part of the main-stream conceptualization of poverty with the publication of the World Development Report "Attacking Poverty" 2000-2001. This was the first World Development Report incorporating the concept of multidimensional poverty, as previous reports incorporated only material deprivation and low levels of health or education into the poverty conceptualization.[116] In light of the discussions on multidimensional poverty, and also in the process of the development of the Millennium Development Goals, the relevance of social protection gradually changed: Until the mid-1990s, social protection still played a minor role in development policy and it was perceived to produce costs and to have negative effects on economic development.[117] This perception has subsequently changed acknowledging that social and economic development is mutually reinforcing. In 1995, this recognition culminated in the first official international development agenda for poverty reduction, social development and social protection in the United Nations "Copenhagen declaration of social development".[118] While the authors of the SRM framework acknowledged that social protection had moved to the center of the development agenda, they criticized that the traditional social protection measures may be less effective at achieving these goals, since they concentrate "on the (ex post) poor instead of the (ex-ante) vulnerable".[119] According to the World Bank, the traditional social protection framework, consisting of labor market interventions, social insurance and pensions, social safety nets and social funds, often consists of passive income redistribution and "fails to address the distribution of risks and resources within the household as well as gender differences in experiences of poverty and vulnerability".[120]

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[116] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 15 and 19f.; Swift, Jeremy (1989): Why Are Rural People Vulnerable to Famine? In: IDS Bulletin, vol. 20, nr. 2; Sen, Amartya (1981): Poverty and Famines. An Essay on Entitlement and Deprivation. Clarendon Press. Oxford, p. 23ff.

[117] Waelkens et al. (2005): The Role of Social Health Protection in Reducing Poverty, p. 11.

[118] For the first time, the heads of state and government 'recognize the significance of social development and human well-being for all and to give to these goals the highest priority both now and into the twenty-first century' and agree on commitments for social development, poverty eradication and their roots, provision for the basic needs, economic and social protection, a.o. It was agreed to include these goals in upcoming structural adjustment programs. UN (1995): Report of the World Summit for Social Development (A/CONF.166/9), pp. paragraph 1, 2, 8, 20; commitments 1,2,8. URL: http://www.un.org/documents/ga/conf166/aconf166-9.htm (accessed 2014/07/21).

[119] Holzmann, Robert; Sherburne-Benz, Lynne; Tesliuc, Emil (2003): Social Risk Management. The World Bank's Approach to Social Protection in a Globalizing World. Washington D.C., p. 1f. URL: http://siteresources.worldbank.org/SOCIALPROTECTION/Publications/20 220 038/SRMWBApproachtoSP.pdf.

[120] The World Bank (2001): Social protection sector strategy, p. 9.

Addressing this criticism, Holzmann and Jørgensen proposed the SRM conceptual framework aiming to cure the risks that may cause poverty instead only the symptoms of poverty. The proposed concept put vulnerability at the core of assessment and set the focus on different forms of prevention (which were called pro-active strategies in the terminology of Social Risk Management).[121] Furthermore, they stated that the SRM framework "extends Social Protection as traditionally defined since it goes beyond public provision of risk management instruments and draws attention to informal and market-based arrangements".[122]

In essence, the original concept of social risk management was defined by Siegel et al. (1999) as "public measures intended to assist households manage risk and uncertainty in order to reduce vulnerability, improve income and consumption smoothing, and contribute to economic development"[123] Hence, the link between poverty and vulnerability was seen in poorly managed risks and therefore, "effective risk management will not only stabilize income and consumption but is an investment in poverty reduction".[124] In 2005, Alwang et al. defined social risk management more comprehensively, stating that the SRM approach "concerns itself with how, and with what instruments, society manages risks. Hence, SRM refers to the social management of risk and not the management of social risks"[125] and they continued by stating that "SRM promotes proactive ex ante risk management strategies […] as substitutes and/or complements to reactive ex post risk coping".[126]

The core of the SRM conceptual framework is a classification of strategies to manage the risks that individuals and households face. The authors classified risk management strategies on three levels: They distinguished between different types of social risk management strategies, between different levels of formality and different types of actors. The different *types of SRM strategies* were grouped into three broad categories:[127]

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[121] Holzmann, Robert; Jorgensen, Steen (2001): Risk and Vulnerability. The forward Looking Role of Social Protection in a Globalizing World. SP Discussion Paper. World Bank. Washington, D. C., p. 3f. URL: http://www.researchgate.net/publication/228 555 978_Risk_and_vulnerability_the_forward_looking_role_of_social_protection_in_a_globalizing_world/file/9c96 052 579a33a8eaf.pdf (accessed 2014/07/04).

[122] Holzmann et al. (2001): Social Risk Management, p. 531.

[123] Siegel, Paul B.; Alwang, Jeffrey (1999): An Asset-Based Approach to Social Risk Management. A Conceptual Framework. Social Protection Discussion Paper Series. World Bank. Washington, D.C., p. 2.

[124] Devereux, Stephen; Sabates-Wheeler, Rachel (2007): Editorial Introduction. Debating Social Protection. In: IDS Bulletin, vol. 38, nr. 3, p. 2.

[125] Alwang, Jeffrey; Siegel, Paul B.; Canagarajah, Sudharshan (2005): Viewing Microinsurance As A Social Risk Management Instrument: Potential and Limitations. In: Journal of Insurance & Risk Management, vol. IV, nr. 07, p. 42.

[126] Ibid.

[127] Holzmann et al. (2001): Social Risk Management, p. 541.

1. Prevention strategies ("to reduce the probability of a down-side risk")
2. Mitigation strategies ("to decrease the potential impact of a future down-side risk")
3. Coping strategies ("to relieve the impact of the risk once it has occurred")[128]

In this categorization, type 1 "prevention strategies" and type 2 "mitigation strategies" are ex-ante measures taken before the risk occurs, while coping strategies are ex-post strategies that are taken after the risk has taken place.[129]

In the original SRM framework, the category of mitigation strategies was further distinguished by *Portfolio diversification strategies*, *Informal and formal insurance mechanisms* and *Hedging*. The aim of *portfolio diversification* strategies is to reduce "the variability of income by relying on a variety of assets from which returns are not perfectly correlated",[130] an example being the accumulation of different types of assets such as physical, financial, human or social capital. The aim of *informal and formal insurance mechanisms* is "risk sharing (i.e., risk pooling) through a number of participants whose risks are not (very) correlated";[131] local informal risk-sharing arrangements or formal insurance schemes are examples of this strategy. The third mitigation strategy described by Holzmann et al. is *hedging* which is "based on risk exchange or payment of a risk price to somebody for assuming that risk".[132] According to Holzmann, this strategy can be found in informal arrangements such as certain family arrangements or labor contracts. The strategy type *hedging* was dropped in later publications (after 2001) describing the SRM framework, without further discussion.

The criterion of the *level of formality* in the SRM framework distinguishes between *informal/personal arrangements*, f*ormal/market-based arrangements* and *formal/publicly mandated or provided arrangements*. The first category informal/personal arrangements comprise strategies like mutual community support or marriage. The second category f*ormal/market-based arrangements* includes the accumulation of financial assets or insurance contracts. The third category of *formal/publicly mandated or provided arrangements* includes social insurance and financial transfers.[133]

The last criterion, the *type of actor*, distinguishes between all possible main actors of social risk management, while the "role of the actors/institutions need to be considered

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[128] All three quotes cited from: Ibid., p. 541f.
[129] Holzmann et al. (2003): Social Risk Management. The World Bank's Approach to Social Protection in a Globalizing World, p. 6f.
[130] Holzmann et al. (2001): Social Risk Management, p. 541.
[131] Ibid.
[132] Ibid., p. 542.
[133] Holzmann et al. (1999): Social protection as social risk management, p. 1016f.

in their capacity to best deal with this situation".[134] These main actors range from individuals, households and communities to NGOs, market institutions, and to government and international institutions.

The main achievement of the concept, the classification of a wide variety of SRM strategies, is its extensibility, which makes theoretical and practical adoption possible. Although several points of criticism were raised on the SRM conceptual framework, particularly on its embeddedness in the social protection frame (see subsequent section 3.2), a refinement of the classification has barely been made. Still, the uptake of the classification of SRM strategies has been quite high. According to Devereux et al. (2007) the SRM framework became the "most influential approach to social protection"[135]. Competing conceptual frameworks include the "Transformative Social Protection", the "Asset thresholds", the "POVNET approach" and the "Universal Social Minimum". Different from the SRM approach, these frameworks highlight other aspects more intensively, such as social protection as a basic right, structural causes of vulnerability and a guarantee of minimum resources for a decent and dignified livelihood.[136] The SRM framework focuses on transitional poverty as a result of risks "as a complement to social protection's more traditional emphasis on equity and basic needs"[137]. De Neubourg et al. (2000) argued that the main achievement of the SRM approach in social policy lay in the widening of scope with regard to social policy instruments and strategies and that it highlighted the roles and interdependencies of public authorities, markets and families in their contribution to social welfare.[138]

In the course of this study, the SRM framework has been adopted as a concept (see section 3.3) for analyzing the behavior of individuals and households in the light of (health) risks. The starting point in the discussion of the SRM framework is that households are exposed to a multitude of risks and poor households are particularly vulnerable to them. By investing in a complex combination of physical, cultural/human and social capital, each household builds its own array of SRM strategies, in order to manage their risks or to cope with shocks in order to avoid consumption shortfalls.[139] In section 3.2, criticism on the SRM framework and recent developments are discussed. In section 3.3, the general adaptation of the SRM framework is developed and presented with several extensions and improvements to the original concept; this adaptation will then be used further in this study.

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[134] Holzmann et al. (2001): Social Risk Management, p. 543.
[135] Devereux et al. (2007): Editorial Introduction, p. 2.
[136] Devereux et al. (2007): Editorial Introduction.
[137] Ibid., p. 2.
[138] De Neubourg et al. (2000): Social Policy as Social Risk Management, p. 412.
[139] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 9f.

3.2. Criticism and recent developments of the SRM framework

During the last decade, the SRM framework, driven mainly by the World Bank, has made enormous inroads in social and development policies in low-income countries. However, several points of criticism were raised on the Social Risk Management framework.

The strength of the framework is its focus on income risks and on household strategies for dealing with associated shocks. This focus is also its weakness, as it neither puts chronic poverty at the core, nor does it fully capture the multidimensional nature of poverty.[140] In the wider sense of risk management, enormous promotional effort needs to be invested in enabling the chronically poor to be able to manage their risks, which includes improving education, their generally poor health status (e.g. due to under-/malnutrition and living conditions) and political rights.[141] Holzmann et al. (2007) acknowledged that the SRM framework was less relevant in dealing with structural determinants of poverty, so that several measures including traditional social protection elements, economic growth and poverty reduction measures were needed.[142] Furthermore, the explicit conceptual linking of chronic poverty and risk management capacities, as stated in the SRM concept, has been criticized by McKinnon (2004) who argued that chronic poverty is not always linked to high risk exposure or the lack of SRM strategies. He gave the example of the elderly poor, who lay beyond the SRM framework and emphasized the need for state interventions for such groups.[143]

As pointed out above, several risk constellations pose a particular challenge to households' risk management capacities and might overwhelm them. While households can more easily deal with single smaller risks or small but frequent shocks, their capacities reach limits when risks occur repeatedly or are bunched or when they are large, infrequent shocks.[144] In this regard, Holzmann et al. (2007) acknowledged that the SRM framework needed to be extended to better capture the idea of "redundancy" in SRM. Redundant SRM strategies mean that there are "multiple layers of risk man-

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[140] The World Health Report 2000/2001, for example, mentioned multiple dimensions of poverty; besides income poverty and vulnerability for example also forms of social exclusion, access to education, civil and political liberties. The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 15ff.

[141] Guenther, Bruce; Huda, Karishma; Macauslan, Ian (2007): Broadening Social Risk Management. Risks, Rights and the Chronic Poor. In: IDS Bulletin, vol. 38, nr. 3, p. 17f.

[142] Holzmann, Robert; Kozel, Valerie (2007): The Role of Social Risk Management in Development. A World Bank View. Reply to Comments. In: IDS Bulletin, p. 21.

[143] McKinnon, Roddy (2004): Social Risk Management and the World Bank. Resetting the 'Standards' for Social Security? In: Journal of Risk Research, vol. 7, nr. 3, p. 310.

[144] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 10f.

agement instruments that can come into effect once a prior layer is exhausted"[145]. Although the idea of redundancy was not present in the original outline of the framework, it already included SRM strategies on higher levels beyond the individual- or household-level, such as governmental measures, e.g. public social safety nets, or private and market-based instruments.[146]

McKinnon also criticized another main assumption in the SRM framework. He challenged the main assumption that access to proper SRM strategies resulted in higher risk-taking, which again resulted in higher returns and, finally, in economic development. He argued that asset ownership did not necessarily lead to increased income and criticized the premise of the 'rational actor' in neo-liberal thinking, without acknowledging the actors' embeddedness in moral and social value systems and the existence of personal risk attitudes. Furthermore, he pointed out that higher risk-taking comes with higher risk exposure that could make the poorest worse off.[147]

Furthermore, the reduced scope of the SRM concept to center merely around negative income effects of risks has been criticized, as it neglected the social and psychological effects of risks, as well as different perceptions of risk assessment.[148] Generally, how the poor evaluate risk, and how choices with regard to risk and risk management are made, has not sufficiently been reflected in the SRM framework.[149] The lack of discussion about the key risk management functions *identification*, *monitoring* and *assessment* of risks, as well as the evaluation of the appropriateness of certain SRM strategies, has been called a weakness of the SRM approach.[150] In the adoption of the SRM approach, few researchers included these key risk management features in their extensions of the concept.[151] Understanding the perceptions about risk, knowing the processes of risk evaluation and clarifying the selection of appropriate SRM strategies by individuals and households are crucial to understanding the real role of SRM strategies and their actual contribution to social protection of low-income households.

Although the SRM approach sought to reposition "the traditional areas of Social Protection (labor market intervention, social insurance and social safety nets) in a framework that includes [...] strategies to deal with risk"[152] and therefore claimed to be

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[145] Holzmann et al. (2007): The Role of Social Risk Management in Development, Reply to comments, p. 21.
[146] Ibid.
[147] McKinnon (2004): Social risk management and the World Bank, p. 308.
[148] Guenther et al. (2007): Broadening Social Risk Management, p. 17.
[149] Haddad, Lawrence (2007): Comment on 'The Role of Social Risk Management in Development. A World Bank View'. In: IDS Bulletin, vol. 38, nr. 3, p. 15.
[150] McKinnon (2004): Social risk management and the World Bank, p. 309.
[151] see Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen, p. 21.
[152] Holzmann et al. (2001): Social Risk Management, p. 1.

an overarching concept, "it appears decidedly limited, arguably static, in its ambition to pursue [...] 'social justice'"[153]. Thus, the SRM concept, as laid out in its original publication, did not include acknowledgment of normative criteria such as the social 'Minimum Standards' and "the belief that social protection is a fundamental right of all citizens"[154]. On the other hand, social protection as a human right is the view taken by the International Labour Organization (ILO), UNDP, and OECD.[155] The ILO declared social protection as a human right to be a priority objective. During the 1990s, the ILO reconsidered its approach on social security and broadened it from income security to a more general *basic needs* model and included a wider range of contingencies and risks.[156] The new understanding of social protection included all measures from individual, household, private and public actors that provide social security elements. In addition to the traditional social security measures, such as social assistance, social (health) insurance and benefits for families with children, the new understanding at the ILO included protection against "economic and social distress that would be caused by the absence or a substantial reduction of income from work as a result of various contingencies (sickness, maternity, employment injury, unemployment, invalidity, old age, death of the breadwinner)".[157] The ILO *decent work* concept was part of the same broader understanding of social protection, but with a focus on "contingencies that arise in work".[158]

Looking closely at both approaches, the SRM framework and the ILO rights-based social protection approach are not contradictory, but rather complementary: A normative element, which is inherent in the ILO approach, is little discussed in the SRM framework. In the SRM framework, the implicit normative goal is the reduction of vulnerability; the ILO approach sees social protection as a human right, which includes the goal of reducing vulnerability. The ILO approach is much wider in scope than the SRM framework, as it includes the traditional social security elements, aims to secure basic needs and also protection from contingencies/risks, while the latter focuses mostly on the management of risks. However, the SRM framework also acknowledged

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[153] McKinnon (2004): Social risk management and the World Bank, p. 304.

[154] Ibid., p. 308f.

[155] Yates, Jenny; Cooper, Ros; Holland, Jeremy (2006): Social Protection and Health. Experiences in Uganda. In: Development Policy Review, vol. 24, nr. 3, p. 340.

[156] van Ginneken, Wouter (1996): Social Security for the Informal Sector. Issues, Options and Tasks Ahead. In: International Labour Office Geneva Working Paper, p. 2.

[157] Waelkens et al. (2005): The Role of Social Health Protection in Reducing Poverty, p. 13f.

[158] International Labour Office (2002): Decent Work and the Informal Economy, vol. 4. International Labour Office. Geneva, p. 57. URL: http://www.ilo.org/public/english/standards/relm/ilc/ilc90/pdf/rep-vi.pdf (accessed 2010/05/14).

the need for provision by the government of social assistance programs for the poor.[159] Waelkens argued that both approaches "are gradually merging"[160] and there is good indication for this, although slight discrepancies remain. For example, the authors of the SRM framework perceived publicly provided schemes as more critical than the advocates of the ILO social protection approach and pointed to the risk that "poorly designed and/or implemented systems, governance problems, or exaggerated generosity" can cause significant negative welfare effects.[161] Similarly, the SRM framework was criticized as focusing too strongly on the productivity aspect of social protection and not fully integrating the aspects of entitlement and basic needs of the chronic poor.[162] In a response to Guenther et al. (2007), Holzmann et al. (2007) expressed hesitation at including the postulation for minimum provisions, following the right-based approach in the SRM framework, and calling for more empirical research on whether this approach leads to long-term sustainability of social protection, but also acknowledging that recent research points in this direction.[163]

In addition to the previously discussed points, the SRM framework has a few methodological shortcomings. Although the concept of social risk management has been incorporated into many programs by development agencies and organizations, or has influenced their policies, the requirements of an academic framework differ from practical needs for development strategies.

Critics have raised two points which require further improvements of the concept: the lack of analytical structures to assess combinations of risks and their impact, and risks that cause irreversible effects and, therefore, render risk management after occurrence of the risk more difficult.[164] Generally, the transmission mechanism between risks and shocks was also not discussed in the original SRM framework. In this regard, and also with regard to the distinction between key terms of the framework, the framework remains remarkably vague.

There is a whole array of SRM strategies that do not reduce the probability of risk, but do reduce the extent of the resulting shock.[165] These are barely reflected in the SRM framework. For example, a communal fire brigade usually does not aim to reduce the

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[159]   see also van Ginneken (1996): Social Security for the Informal Sector. Issues, Options and Tasks Ahead, p. 3f; Holzmann et al. (1999): Social protection as social risk management, p. 15; Holzmann et al. (2007): The Role of Social Risk Management in Development, Reply to comments, p. 21.

[160]   Waelkens et al. (2005): The Role of Social Health Protection in Reducing Poverty, p. 14.

[161]   Holzmann et al. (2001): Social Risk Management, p. 535.

[162]   Guenther et al. (2007): Broadening Social Risk Management, p. 18.

[163]   Holzmann et al. (2007): The Role of Social Risk Management in Development, Reply to comments, p. 20f.

[164]   Haddad (2007): Comment on 'The Role of Social Risk Management in Development, p. 15f.

[165]   cp. Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen, p. 22.

probability of fire, but the extent of damage after a fire occurs. Similarly, the extent of the negative consequences of an illness can be minimized by early diagnosis and treatment.[166] This lack of the *second aspect of prevention* is a major omission in the original SRM framework.

The lacking selectivity of key terms and strategies is to be criticized: Between 1999 and 2007, at least six articles have been published on the concept of social risk management by Holzmann, with varying co-authors. Reviewing these publications gives the impression that the definitions of key terms and the distinction of the terms *risk*, *shock, effects of a risk, impact of a risk,* and *impact of a shock* have not been elaborated on sufficiently. Also, the framework has been changed without further discussion; for example, the strategy "Hedging", which was described in early publications of the concept, was removed from later publications.[167] In addition, the descriptions of the main SRM strategies were not consistent between publications, for example the description for the same strategy changed from "mollify the risks"[168] to "decrease the potential of a future down-side risk"[169] and "reduce the impact of a future risk"[170] to "mitigate the effects of the risk".[171]

In the original framework, the classification of risks, the classification of main SRM strategies and the classification of actors did not sharply distinguish between the included elements and did not capture the full range of options. Whereas a classification system aims to group strategies into classes where they best fit and tries to make the classes distinguishable or mutually exclusive, a typology system consists of logically exclusive categories (=types) that aim to be complete without the possibility that there is a type outside of the typology (if categorical) or outside the scale of the typology (if metric). Although this is difficult to achieve, it is preferable from an analytical viewpoint. Apart from the binary distinction between proactive and reactive strategies, the original authors of the SRM framework followed the classification approach. An academic revision of the concept has been done by Rösner (2008) which approximates a

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[166] McKinnon, Roddy (2010): Promoting the Concept of Prevention in Social Security. Issues and Challenges for the International Social Security Association. In: International Journal of Social Welfare, vol. 19, nr. 4, p. 456.

[167] Holzmann et al. (1999): Social Protection as Social Risk Management. Conceptual Underpinnings for the Social Protection Sector Strategy Paper, p. 1018; Holzmann et al. (2001): Social Risk Management, p. 542.

[168] Holzmann et al. (1999): Social protection as social risk management, p. 1014.

[169] Holzmann et al. (2001): Social Risk Management, p. 541.

[170] Holzmann et al. (2003): Social Risk Management. The World Bank's Approach to Social Protection in a Globalizing World, p. 7.

[171] Holzmann et al. (2007): The Role of Social Risk Management in Development, p. 11.

typology of the original concept.[172] Further steps toward a typology are carried out in section 3.3.

The SRM framework, provided the criticized points are considered, can serve as an analytical tool of risk exposure and social risk management, but it needs to be acknowledged that SRM is one part of a variety of social, political and economic measures, providing social protection and is interdependent with other measures. For example, the World Development Report 2000-2001 stated that, besides social risk management, "Economic growth is one way of reducing vulnerability of poor people. As their incomes rise they are better able to manage risks"[173]. This shows that effective SRM strategies are essential to reduce the vulnerability of poor households, but cannot serve their ultimate purpose if other factors in a country do not improve.

In summary, the positioning of the SRM framework as an overarching concept is overstating its scope. It needs to be seen rather as an integral part of social protection. It is good at capturing mechanisms to counter contingencies and to reduce vulnerability; therefore, it is located between policies to guarantee a social minimum (addressing chronic poverty) and policies to achieve economic and social empowerment, political rights and growth. These three areas of intervention are interdependent. With the idea of redundancy in SRM strategies on multiple levels, the SRM framework can address risk exposure and vulnerability of the chronic poor, and those risks resulting in irreversible effects. These two groups are likely to be overburdened in risk management and may lack sufficient access to SRM strategies on individual and household level, and therefore require support in risk management from higher levels. If limited to the purpose of reducing vulnerability, the SRM framework can serve as a significant analytical concept, provided methodological shortcomings are addressed to make the framework useful in academic analyses.

3.3. Adaptation of the social risk management framework

The discussion in the previous section 3.2 revealed some conceptual deficiencies in the original SRM framework. For example, critical points were raised on the incomplete link of the framework to 'traditional social protection' mechanisms and chronic poverty, the lack of a human rights view on social protection, the exclusive focus on income risks, the missing discussion on risk perception and risk assessment, as well as the lack of discussion on irreversible and bunched shocks in the framework. Further-

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[172] Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen, p. 21ff.
[173] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 135.

more, methodological issues were raised about the framework, particularly on the definition of key terms and weaknesses in the classification of SRM strategies.

For this study, the framework was adapted to remedy the methodological shortcomings (e.g. definitions and typology) and to integrate some points raised by critics and newer developments in the SRM framework. By this, the study follows the embedded design of social risk management. In this sense, SRM is seen as an integral part of social protection in general and with regard to health risks. In line with some critics of the SRM framework, it needs to be acknowledged that not all social protection measures have the primary goal of risk management, but might have positive side effects on risk management capacities. Such is the case with improvements to an equitable educational system, economic growth, civil rights and opportunity enhancing measures or empowerment strategies.[174] Additionally, the adapted framework is not only restricted to "public measures" assisting households to manage risks, but includes all SRM strategies protecting households or individuals from risk exposure or the impact of risks, independently from the type of actor, whether they are initiated or carried out by individuals, households, NGOs, cooperatives, private and public actors, and independently from the level where risk management is applied.[175]

Following this wider approach of the framework, *Social Risk Management* refers to how societies cope with risks and "encompasses a broad range of informal and formal proactive and reactive strategies used by individuals, families, communities and nations, including private and public interventions to assist vulnerable individuals or groups in the assessment of risks and to provide support against impacts of exposure to risk".[176]

As noted above and as shown in figure 1, the SRM framework cannot be seen as a separate framework or as an overarching concept for social protection, but has to be embedded in the institutional framework and the wider environment where individuals and households live. The need and application of SRM strategies are particularly dependent on two factors:

First, they are dependent on the economic capabilities of the actors that can carry out social risk management. The rationale of highlighting the economic capabilities is that the access or feasibility of many SRM strategies is dependent on the economic status of the potential actors in social risk management. For example, if a household is

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[174] cp. Yates et al. (2006): Social Protection and Health, p. 341.

[175] Rösner, Hans Jürgen (2012): Micro Health Insurance in Different Institutional Settings. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa. LIT Verlag. Berlin, p. 23.

[176] Ibid.; Cp. Holzmann et al. (2001): Social Risk Management, p. 1.

economically able to reach a certain asset threshold, the vulnerability to certain shocks is reduced, because the asset base is sufficient to mitigate the shock. Similarly, if the economic capabilities of a country are sufficient for disaster prevention through the construction of dams or irrigation systems, the risk for individuals and households to experience severe droughts or flooding is reduced. Hence, economic capabilities and the access to social risk management strategies is interdependent, so that there is a trade-off in governmental programs: Either, the political actors in the first place enact policies for economic development and reduction of chronic poverty that enables households with better access to SRM strategies in the second place, or they enact policies for the improvement of SRM strategies in the first place which protect the economic capabilities of individuals and households and allow economic development in the second place. Figure 1 displays only those policies from which a direct effect on SRM can be expected, policies to improve education or civil liberties and good governance are likely to have positive side effects on social risk management, but rather indirectly.

Second, the need and application of SRM strategies depend on the extent of perceived risk exposure. This is crucial, because first, a comprehensive and objective scale of risk exposure cannot exist. Second, the entire process of risk identification and risk assessment needed to be taken into consideration, because the perceived need for risk management grows with increased understanding of the causes of risk and its impact (see figure 1). Either if a risk is unknown or the linkages between risk and shock are unknown, those SRM strategies which are objectively appropriate may subjectively be perceived as not required. On the other hand, if the individual or household is aware of the risk, a risk assessment was successful in linking cause and effect, and a possible response is identified, this significantly influences the awareness of the need for application of the appropriate SRM strategies for this particular risk.

On the relationship between risk exposure, risk identification and risk assessment, the SRM framework remains rather weak, although the original SRM framework was operationalized by The World Bank in so-called "Risk and Vulnerability Assessments" for the implementation of SRM programs and the setting of priorities and sequences of action. These assessments are based on macroeconomic risk data, data from households surveys or qualitative methods to elicit the risk perception of the target group.[177] Vulnerability analyses are an essential part of these assessments.[178] The assessments are based on the assumption that risks can be objectively assessed and then suitable re-

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[177] Holzmann et al. (2001): Risk and vulnerability, p. 17f.
[178] Holzmann et al. (2003): Social Risk Management. The World Bank's Approach to Social Protection in a Globalizing World, p. 10.

Fig. 1: Typology of social risk management strategies

Risk exposure Economic capabilities

Risk identification
Risk assessment

Policies for economic development and reduction of chronic poverty

Social Risk Management strategies

Proactive strategies Reactive strategies

To reduce the probability of an adverse risk

To limit the extent of the shock or its impact

To mitigate the impact of the shock

To relieve the impact of the shock

Risk diversification

	Risk reduction or elimination	Shock reduction or elimination	Self-insurance	Portfolio diversification	Risk sharing	Risk pooling	Coping with shocks
Individual or household							
Group- or Community-based							
Market-based or non-profit sector							
Publicly provided							

Source: author, based on Rösner 2008; Holzmann et al. 1999, 2001, 2003, 2007, The World Bank 2001.

sponse mechanisms need to be found to combat these risks. Nevertheless, the original SRM framework contains little information on the actual mental and cognitive processes of risk management among the target population itself.

As indicated above, the process of risk management is complex and comprises several stages in order to make informed and strategic decisions regarding the manage-

ment of unsure events.[179] In a first step, the risk or threat needs to be perceived and identified, in order to be able to deal with it. An important part of risk identification is the causal analysis or in other words the answer to the question: what is needed for the risk to occur.[180] In many cases, the causal analysis is particularly difficult, as it requires some understanding of the underlying system. The result of the causal analysis implies possible response strategies. For example, if the cause for a bad health situation is perceived by the individual not to be caused by viruses or bacteria, but rather by witchcraft or other supernatural forces, the identified risk and the possible response strategies are completely different.[181] In such a case, it would not be perceived as a risk with a certain probability (because it is directly caused by another human being or by their own bad behavior and it is not based on randomness) and the resulting response strategies would be the consultation of a traditional healer, instead of preventive health measures or a medical treatment. Another important step in the process of risk management is the estimation of the probability of occurrence and the extent of the shock (=severity) and its potential impact on the individual or household. Based on this risk assessment, the household can develop an appropriate and feasible response strategy, which includes the evaluation, selection and implementation of *preventive actions to reduce or eliminate the risk* or other *proactive strategies to limit the extent of the shock or its impact* or to *mitigate the impact of the shock*.[182] It is necessary to keep in mind that the residual option for the individual or household is always the conscious or unconscious decision not to act in any way before the risk occurs (which implies the use of *reactive risk management strategies* in the case that the risk occurs). The entire process of risk management requires considerable knowledge and education as well as the means to react to a risk.

In section 3.2 it was noted that the lack of a clear distinction between key terms is a main weakness of the SRM framework. Hence, this study aims for clarity of the terms and definitions used. In the context of this study, a *risk* refers to a future uncertain negative variation that can be assigned to a certain probability of occurrence (see section 2). As discussed in section 2.2, a *shock* is defined as a major peak of pressure on the individual or household beyond the normal range of variability and is the realization of a risk. Furthermore, the *impact of a shock* refers to the extent to which a shock reduces

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[179] Educating target groups about risk management is part of holistic financial education programs, see: Nelson, Candace (2008): Risk Management and Insurance - Protect your family's future, Trainer's Guide, edited by Global Financial Education Team. Washington, D.C., p. ii.

[180] Aven (2008): Risk analysis, p. 39f.

[181] Witchcraft, black magic or the 'evil eye' is still a common belief in Malawian or Ghanaian societies. Breslow (2002): Encyclopedia of Public Health, p. 123 'Black magic and evil eye'.

[182] Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen, p. 21.

the well-being of an individual or household. Consequentially, it is important to note that the shock does not equate with the actual reduction of well-being which the individual or household experiences. For example, if a tsunami occurs (the risk), usually a large wave (the shock) hits the shore of a country with a certain intensity. If the country has not prepared for a potential tsunami wave, such a shock likely has a severe negative impact on households. However, if a country installed an early warning system, built dams and built houses with an elevated first floor (e.g. built on top of poles), the impact on individuals and households will be rather minor. Still, neither the risk of a tsunami was reduced, nor the extent of the shock. This example illustrates that vulnerability to a risk depends on risk exposure, the extent of the shock and the application of SRM strategies. Thus, for a thorough analysis of SRM strategies, a strict conceptual distinction of *risk*, *shock*, and *impact of a shock* is required.[183]

Figure 1 presents a typology of the main four types of social risk management strategies, with seven classes of strategies. As in the original SRM framework, the main distinction between the SRM strategies is drawn between *proactive strategies* meaning 'actions put in place in anticipation of a shock' before the risk event occurs and *reactive strategies*, meaning 'actions in response to a shock' once the risk has occurred.[184] In a second level, the proactive strategies are distinguished using three main sub-types:

(1) whether the strategy aims *to reduce the probability of the risk*,

(2) whether it aims to *limit the extent of the shock or its impact* or

(3) whether the strategy aims *to mitigate the impact of the shock*.

Since reactive strategies are used after the shock occurred, they have the major aim *to relieve the impact of the shock*. Both, sub-type 3 of proactive strategies and the reactive strategies, do not have any influence on the extent of the shock, but rather proactively mitigate or reactively relieve the impact of the shock, while mitigation is seen as a more active process than the one to relieve the impact.[185]

All strategies can be initiated and carried out by actors on different levels. Figure 1 shows four different groups of actors: (1) Individual or household, (2) group- or community-based, (3) market-based or non-profit sector and (4) publicly provided, while publicly provided includes several layers of government (regional, national) as well as

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[183] An even finer distinction between primary and secondary shocks as well as primary and secondary impacts will be discussed in this section on the topic of reactive strategies.

[184] Siegel et al. (1999): An Asset-Based Approach to Social Risk Management. A Conceptual Framework; Holzmann et al. (2001): Social Risk Management; Alwang et al. (2005): Viewing Microinsurance As A Social Risk Management Instrument: Potential and Limitations; Rösner (2008): Risikomanagementstrategien für arme ländliche Bevölkerungsgruppen.

[185] In the terminology used, mitigating is perceived to be pursued in a more actively and forward looking manner while relieving is perceived to be more passive or with the only aim only to reactively reduce the burden from the individual or household.

international agreements and actions. As previously discussed, it is difficult to determine the adequate level for the management of certain risks. As Holzmann et al. initially suggested, most risk management strategies can take place at the lowest, individual/household level, as they have "all the private information" and therefore the issue of asymmetrical information can be avoided, which is a problem for higher risk management levels.[186] At the same time, it is obvious that certain risks are likely to overburden the individual/household level, such as the cost of hospitalization. Considering these points and the criticism on the original SRM framework, it seems that two principles are most appropriate for efficient and effective social risk management: redundancy and subsidiarity. The first principle, redundancy, has been discussed in section 3.2, stating that it is favorable to provide strategies for the same type of risk on multiple levels in order to prevent failures of SRM strategies on other (lower) levels. On the other hand, the principle of subsidiarity takes up the idea by Holzmann et al. of pursuing the lowest possible level of risk management: The principle of subsidiarity is an essential element of social policy in welfare states; it postulates that the lowest organizational level shall be preferred where certain actions in social policy can be performed. Since some required information is only available on this level, it might be the most efficient level. In case where the actors on that level are unable to perform the action, support of self-help capacities is often the appropriate response, in contrast to shifting the responsibility of the action to a higher level.[187] The incapacity to self-help might be a particular problem in a low-income setting, where an insufficient economic situation of households and the local level often results in lacking self-help capacities. Hence, the aforementioned multiple layers of SRM strategies represents two different aspects when a higher level comes into effect: the action at the higher level can either aim to support self-help capacities or take over responsibilities for risk management.

3.4. Social risk management strategies in the adaptation of the SRM framework

The previous section laid out the two main types of social risk management: proactive and reactive strategies. Furthermore, for the proactive type, three more sub-types were presented ranging from the *reduction of the probability of an adverse risk,* and the *limitation of the extent of the shock or its impact* to the *mitigation of the impact of the shock.* The resulting seven main strategy classes are at the third level, below the sub-types.

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[186] Holzmann et al. (2001): Social Risk Management, p. 1009 and 1019.
[187] cp. Frerich, Johannes (1996): Sozialpolitik, 3 edition. Oldenbourg Verlag. München, p. 31; Ribhegge, Hermann (2004): Sozialpolitik. Verlag Franz Vahlen. München, p. 43ff.

The strategy classes are presented in the following, starting from the left side in figure 1 to the right.

Prevention of risks is certainly the most elegant SRM strategy, as it aims to reduce the probability of the risk, which reduces the occurrence and, therefore, does not result in a shock. *Risk reduction* and *risk elimination (or avoidance)* strategies aim to reduce the probability of occurrence of an adverse risk. In cases where the probability can be reduced to zero, it is called risk elimination. It is obvious that the majority of risks cannot be fully eliminated, for example, the risk of an accident in traffic can never be reduced to zero. However, for example, the risk of low agricultural yield can be eliminated by moving to a non-agricultural profession. Another example for risk elimination is the risk of drought due to lack of rainfall removed by using complex irrigation systems, e.g. through the use of permanent groundwater. In case of landslides and flooding, disaster risk can be eliminated by community risk assessments and targeted resettlements of households to unaffected areas.[188] Other risks can be successfully reduced, but not eliminated, such as the construction of dikes can reduce the risk of flooding. With regard to health risks, several prevention strategies exist. Some health risks can be successfully *reduced* by specific actions like hygiene measures, sanitation or healthy nutrition. The risk of certain illnesses can even be nearly *eliminated* through vaccinations. However, these illnesses, such as Meningitis and Hepatitis B, but also Pertussis and Tetanus, are still prevalent and frequent causes of death in Malawi and Ghana.[189] These actions can reduce or eliminate the probability of occurrence of the illness event.

Even if the probability of the risk itself cannot be reduced, a significant proactive strategy can be to try *to limit the extent of the shock or the extent of the impact*. This includes all strategies that are proactively put in place to properly (or quickly) react, in the case the risk occurs, so that the extent of the shock or damage can still be reduced. For many types of risk, this is a relevant SRM strategy class which has received too little attention. This type of proactive strategy is missing from the original SRM framework, which is a significant omission. In his work on the concept of prevention in social security, McKinnon elaborated different types of prevention in detail.[190] He ex-

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[188] for cooperative risk assessments and pro-active risk elimination see: Seiler, Eberhard (2008): Beiträge von kooperativer Selbsthilfe zum Risikomanagement von Naturkatastrophen. In: Zeitschrift für das gesamte Genossenschaftswesen, vol. Sonderheft 2008, p. 77ff.

[189] World Health Organization (WHO) (2011): WHO Disease and injury country estimates: Death and DALY estimates for 2009 by cause for WHO Member States, Persons, all ages, WHO. URL: http://www.who.int/healthinfo/global_burden_disease/estimates_country/en/index.html (accessed 2012/10/03).

[190] McKinnon (2010): Promoting the concept of prevention in social security, p. 456f.

tracted three different levels of prevention. The first type of prevention perfectly corresponds to the aforementioned SRM strategy *risk reduction or elimination* or using Holzmann's words to "prevent the risk from occurring"[191]. The second type of prevention is missing from the original SRM framework, as it aims to limit the extent of the shock or the extent of the impact, including measures such as early diagnosis and treatment to reduce the total extent, such as serious consequences of an illness. Storing basic drugs and dressing materials at home, the establishment of an emergency ambulance, a fire brigade or a responsive health care system are practical examples. They do not reduce the probability of the risk, but are pro-actively put in place to reduce the extent of damage from the risk occurrence.

The third sub-type of SRM strategies aims to *mitigate the impact of a shock* and comprises complex groups of proactive risk management strategies. It partially corresponds to the third type of prevention in McKinnon's typology and the SRM strategy termed *risk mitigation* in the original SRM framework.[192] Like the above described proactive strategies, mitigation strategies are set in place before the risk occurs, but they neither reduce the probability of the risk, nor the overall extent of the damage. They rather aim to mitigate the impact of the shock on the individual or household (and ultimately may be able to reduce secondary risks). This is done by either pooling over time (*self-insurance*), over assets affected by different risk types (*portfolio diversification*) or between individuals (*risk sharing* or *risk pooling).*[193]

Probably the most common SRM strategy is *self-insurance,* which means that the individuals or the household pool its resources over time. It follows the simple logic of "accumulating assets in good times and drawing on them in bad".[194] Building up an asset base for future events or shocks is an essential tool for poor households to secure and develop their livelihoods. Individual and household assets can take various different forms: Generally, assets can be defined as a "stock of wealth used to generate well-being"[195]. This wide definition comprises a complex portfolio of assets in its multiple types including *stores*, *investments* and *claims*.[196] With regard to assets, there needs to be a distinction between tangible and intangible assets, occurring on a continuum, from readily available assets (e.g. for risk management purposes of the household) and

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[191] Holzmann et al. (2007): The Role of Social Risk Management in Development, p. 11.

[192] Ibid.; McKinnon (2010): Promoting the concept of prevention in social security, p. 456.

[193] cp. Holzmann et al. (2001): Social Risk Management, p. 8.

[194] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 143.

[195] Siegel et al. (1999): An Asset-Based Approach to Social Risk Management. A Conceptual Framework, p. 10.

[196] Chambers (2006): Vulnerability, Coping and Policy (Editorial Introduction), p. 36; Swift (1989): Why Are Rural People Vulnerable to Famine?, p. 44.

assets that are only available after a longer duration, to intangible but potentially existent assets. Some assets can also have different forms of return, thus matching more than one point on the continuum.[197] Stores are tangible assets and include goods such as precious metals, jewels or other objects of value including live-stock, crop reserves or food stores, including cash savings or bank accounts.[198] With regard to availability, stores range from quickly to relatively quickly available, heavily depending on the functioning of (local) asset markets.

Access to financial assets, which fall into the group of asset stores, can be facilitated by microfinance institutions that can provide access to financial products, such as deposits or savings products, to people with low-income. Informal or semi-formal rotating savings and credit associations (RoSCA) play an enormous role as flexible savings schemes, in order to pay for unpredictable costs, "as they often extend loans, which may be used for consumption".[199,200]

Building up savings and assets for future shocks is a commonly used proactive SRM strategy in developing countries. However, this type of strategy has some implicit imperfections. First, access to secure savings and asset-holding, as well as access to durable assets of stable value, is often restricted. Second, many physical assets are indivisible, e.g. cattle, so that return and actual need might be mismatched. Third, sale of physical assets depends on functioning asset markets, which can be a problem in rural areas, particularly in times of need. Fourth, assets in livestock and crop reserves have the implicit problem that the prices vary and, in times of a shock, the return might even be negative. This is particularly the case if the shock hits the entire community.[201] Particularly after a macro shock, the value of assets and income are often covariant, so that it is difficult to mitigate an income shock through the sale of assets.[202]

Formal financial products, such as savings at banks, are often not accessible to poor and rural households. In most developing countries, there are gaps in the formal financial sector, since formal banks often do not target rural areas and the low-income sector, due to low profit margins and high transaction costs. These financing gaps are of-

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[197] Drought animals or milk cows can either be used for production and income generation or they can be sold (for quicker returns, but might result in less efficient future production).

[198] Swift (1989): Why Are Rural People Vulnerable to Famine?, p. 44.

[199] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 13.

[200] Seibel, Hans D. (2008): Changing Patterns of Risk Management by Self-Help Organizations of Savings and Credit. The Nigerian Experience. In: Zeitschrift für das gesamte Genossenschaftswesen, vol. Sonderheft 2008.

[201] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 14f.

[202] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 143.

ten closed by semi-formal or informal micro-financial institutions providing small loans and savings accounts to the target group.[203]

Investments comprise tangible and intangible assets. Individual productive assets are, for example, farming or business equipment (e.g. animals, plants, inputs, machines), buildings and household equipment, as well as infrastructure (e.g. land, wells, transport means). Collective assets include shared production facilities (e.g. mills, irrigation), infrastructure (e.g. water supply and sanitation systems) and rules (e.g. access to common property resources, land rotation). Such collective assets are often less tangible and a household has less control over the use and development of collective assets.[204] With regard to risk management, collective assets often fall in the category of pro-active SRM strategies, as they frequently include agreements on contingencies. Investment in human capital, including education and health, reduce vulnerability of households in the long run and, therefore, need to be categorized as intangible assets that are available after a longer duration.

Following Swift's classification of assets, the third group after stores and investments would be 'claims'. What Swift called 'claims' is close to the concept which other authors would call 'building social capital' (on micro, meso and macro level), 'risk sharing' or 'informal insurance mechanisms' in the SRM terminology. Therefore, Swift's ideas were integrated into the SRM terminology and discussed in the section on risk diversification.[205]

According to Swift, the sequence in which the household's assets, stores and investments, including claims, are used by the household is essential to understanding their use as an SRM strategy.[206] When households face severe shocks, such as famines, there is evidence that the households are not willing to deplete some of their (productive) assets.[207] On the other hand, in order to pay for health care, physical capital, in the form of savings, credit or assets, is an important source, particularly if out-of-pocket payments at point of service are required.

Risk diversification is a sub-type of mitigation strategies, which aim to either diversify the type of risks a household is exposed to or to inter-personally diversify the risk, between a group of individuals.

Through p*ortfolio diversification*, the first strategy class applying risk diversification, a household aims to reduce the vulnerability to certain risks and aims to diversify the

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[203]   cp. Rösner (2013): Mikrofinanzsystementwicklung und produktive Selbsthilfe, p. 311f.
[204]   Swift (1989): Why Are Rural People Vulnerable to Famine?, p. 44f.
[205]   cp. Ibid.; Holzmann et al. (2001): Social Risk Management, p. 541.
[206]   Swift (1989): Why Are Rural People Vulnerable to Famine?, p. 45.
[207]   Ibid., p. 43.

risks the to which household is exposed, thereby reducing the absolute negative impact on the household in the case a risk occurs. Technically speaking, it "reduces the variability of income by relying on a variety of assets from which returns are not perfectly correlated".[208] Hence, it reduces household's vulnerability to a particular shock. A typical example for this is income diversification, which aims at the reduction of income fluctuations through multiple, different, and not entirely correlated, income sources.[209] In developing countries, this often means extending non-farm activities and paid farm activities, besides their own farming activities. Due to market entry constraints, for example due to the lack of skills, formal education or capital, poorer households tend to diversify their income sources less than wealthier households. Income diversification for poorer households is often restricted to activities with low entry costs, such as paid agricultural labor, handcraft production, weaving, food processing, dung-cake collection, and charcoal or firewood production. These activities often imply low-returns.[210] Rural areas pose a particular challenge to income diversification, as different agricultural income sources are heavily correlated. Thus, the income-smoothing effect of diversification in crops, plots and live-stock income is limited due to overall dependency on climate and rain patterns. Also, the entire agricultural labor market is influenced by these factors. Diversification with non-farm activities could partially solve these issues, but positive effects depend on job or market entry barriers.[211]

An alternative strategy to income diversification is *income skewing*. Applying this strategy, the household reduces its income risk by focusing on low-risk activities as main income sources. An example for income skewing is the focus of poor farmers on low-risk crops, for example the very common growing of maize in Malawi. The focus on low-risk activities smooths income, but these activities usually result in low returns.[212] Technologies that reduce fluctuations in income or harvest yields, such as irrigation systems, pesticides, disease-resistant plants as well as advanced agricultural equipment, are often not accessible for low-income households.[213]

Risk diversification within a group of individuals, which also belongs to the sub-type *risk mitigation*, comprises the strategy classes *risk sharing* and *risk pooling*. Like other strategies that belong to the sub-type risk mitigation, these strategies do not reduce the total extent of the shock. However, risk diversification with other individuals outside

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[208] Holzmann et al. (2001): Social Risk Management, p. 541.
[209] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 16f.
[210] Ibid., p. 17f.
[211] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 142.
[212] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 12.
[213] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 137f.

the household reduces both the extent of the shock and the impact of the shock for the affected household itself, since other (unaffected) individuals take over some burden of the shock. This mechanism is referred to by the terms risk pooling or risk sharing. Both mean that losses or costs associated with the negative event are transferred to a group/pool. While *risk sharing* refers to an accumulation of social capital that provides confidence in mutual help, if it is required, *risk pooling* relies on pre-financing (=premium) and a predefined benefit package (=coverage) that are both defined ex-ante. The principle of risk pooling is the core element of insurance schemes. Several strategies of *inter-personal risk diversification* play a large role in SRM.

Informal risk-sharing arrangements are very common in developing countries. Based on relationships, friendships or social networks, with values of solidarity, community cohesion or reciprocal bonds, the individual or household who experiences a shock can have the expectation of reciprocity. Hence, risk-sharing is based on expected, but still voluntary, transfers, gifts or loans to the member of a network facing an emergency. In case of a shock, individuals or households can make claims for resources or help from these networks, such as production or consumption resources, labor or animals from other households in the community. These claims are accumulated based on a wide range of activities; such as borrowing, gifts, support to community funds and activities and from cooperative production and work exchange between kin, friends and neighbors.[214] Generally, in the context of developing countries, it is difficult to differentiate risk-sharing groups from other social interactions. Establishing close links with neighbors, extended family and relatives, and engaging in professional networks or participating in community organizations are typical activities also relevant for SRM, as they build mutual obligations. Although social networks can generally span and link several levels, from micro level (households, community, local authorities) and meso level (clan, kin, business relations and local/district authorities) to the macro level (regional or national authorities and organizations and the international community), the social networks of rural populations are often limited to the micro and meso level.[215]

Although some risk-sharing arrangements explicitly serve risk management purposes, most informal risk-sharing arrangements serve multiple purposes, with SRM being only one of them. Due to the versatile nature of risk-sharing arrangements, it is difficult to analytically capture their capacities for social risk management. Still, evidence showed that informal risk-sharing networks can be a highly relevant SRM strategy, particularly in coping with idiosyncratic risks.[216] Such risks can be more easily

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[214]   cp. Swift (1989): Why Are Rural People Vulnerable to Famine?, p. 44f.
[215]   Ibid., p. 44f.
[216]   Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 12 and 21.

borne at the community-level, but common shocks which affect many or all households in a community exceed the capacities of communities, so that higher level SRM strategies are required.[217] Also, for the success of risk-sharing arrangements, it is important that the risks of participants are not highly correlated. Furthermore, according to a study by the World Bank, another limitation of risk-sharing arrangements is that informal risk-sharing arrangements are more likely to be horizontal than vertical, so that risk-sharing partners have a similar economic status (i.e. risk-sharing between poor households) and are more likely to be exposed to the same risks. On the other hand, in vertical risk-sharing arrangements, patron-client relationships can frequently be observed, which may be disadvantageous for poor households.[218]

Besides informal risk-sharing arrangements, there are more formal *risk-pooling* arrangements that are based less on personal interaction and have more clearly formulated contribution schemes. These more formal arrangements are based on regular payments and have defined rules for loss compensation. Contrary to risk sharing arrangements, insurance schemes are typically based on larger risk pools. Due to the randomness of risks and due to substantial fluctuations in the extent of losses, the size of the risk pool is a critically important factor. With an increasing risk pool size, the fluctuations of loss, in relation to the total loss, decrease. This statistical phenomenon is called *law of large numbers* and allows insurance schemes with a sufficiently large risk pool size to bear the impact of rare, but costly, events (e.g. hospitalizations or surgeries) more efficiently than the individual or small group (e.g. protection from catastrophic health care expenditures).[219]

Reactive strategies refer to all ad-hoc actions that are taken by a household to cope with a loss occurrence. Contrary to proactive strategies, they address the risk only after it occurs. *Coping strategies*, which is the only strategy class in reactive strategies, aim *to relieve the impact of the shock*.[220]

Reactive strategies are usually used when accessible pro-active strategies are exhausted. For smaller shocks, the household might be able to take the money required for risk-coping directly from running income or from cash savings. For larger shocks, borrowing, loans or emergency loans play an important role in risk coping, taken either from moneylenders, banks, microfinance institutions, or RoSCAs.[221] Another reac-

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[217] Ibid., p. 12.
[218] The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I, p. 18.
[219] Berliner, Baruch (1982): Die Grenzen der Versicherbarkeit von Risiken. Zürich, p. 47f.
[220] cp. Holzmann et al. (2001): Social Risk Management, p. 8.
[221] Seibel (2008): Changing Patterns of Risk Management by Self-Help Organizations of Savings and Credit. The Nigerian Experience.

tive strategy is selling assets. These risk-coping strategies often come with a high future debt and interest burden for the household. Many of the shock coping strategies are unproductive and reduce future opportunities, for example if the household has to sell productive assets or livestock. Unproductive SRM strategies include removing children from school (e.g. to save tuition fees and school-related costs) and delaying health care. Reactive strategies also include the increase and reallocation of labor, including temporary migration, and child work, as well as exhausting all potential income sources.[222]

Dercon (2007) reported that risk-coping strategies were easily exhausted and typically insufficient, and therefore, he demanded a stronger focus on better safety nets at higher levels and proactive strategies.[223] An often highlighted example in public health research is the need of households to compensate high health care costs with the sale of productive assets. The application of this strategy can be seen as a last resort: Selling productive assets reduces the future ability of the household to earn income and it increases long-term vulnerability, particularly in the case of repeated or bunched shocks, exhausting the household's asset base.[224]

Cohen et al. (2005) analyzed coping strategies in more detail and concluded that the impact of risks typically follows a two-stage process with immediate and secondary impacts. Immediate impacts refer to the immediate or short-term loss that occurs after the shock hits, such as treatment costs or funeral expenses. The secondary impact of shocks refers to further down-turns due to either the extent of the original shock (and failing, ineffective pro-active SRM strategies), follow-up risks, if the shock could not be successfully mitigated, or as negative side-effects of coping strategies, aimed at relieving the impact of the shock. In their analysis of negative effects of coping strategies, the authors built upon the categorization proposed by Montgomery (1996), who distinguished between low-stress, medium-stress and high-stress coping strategies.[225] Cohen et al. (2005) showed that risks that were expected to be "followed by medium and longer-term repercussions [...] call for other strategic choices by households".[226] While the application of low stress coping strategies themselves entailed mild secondary impacts of shocks, medium stress, and ultimately high stress coping strategies, entailed future severe negative impacts on the household's well-being. For example, using run-

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[222] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 12; Holzmann et al. (2003): Social Risk Management. The World Bank's Approach to Social Protection in a Globalizing World, p. i.

[223] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 13.

[224] Meessen et al. (2003): Iatrogenic Poverty, p. 581.

[225] Montgomery (1996): Disciplining or protecting the poor?, p. 292f.

[226] Cohen, Monique; Sebstad, Jennefer (2005): Reducing Vulnerability. The Demand for Microinsurance. In: Journal of International Development, vol. 17, nr. 3, p. 407.

ning income, improving family budgeting and modifications to consumption were categorized as low stress coping strategies in response to shocks, because they lead to only minor secondary shocks, such as a temporary change in lifestyle or reallocation of household resources. The use of savings and borrowing from informal or formal sources were categorized as medium stress strategies, because they deplete financial resources and cause indebtedness. In addition, high stress coping strategies caused severe secondary shocks such as reduced long-term productive capacity, reduced future chances of children and increased vulnerability due to depleted assets. Examples of high stress coping strategies were selling productive assets, taking children out of school, reducing food consumption, defaulting on loans or diverting to illegal income earning activities.[227] An example of a severely high-stress coping strategy is depleting human capital by reducing food consumption and cutting the number or size of meals, which may cause long-term detrimental impacts on children's physical and cognitive development.[228] This last example corresponds to a category introduced by Devereux (1999). Devereux used a different terminology for coping strategies and described an additional form of reactive behavior in response to shocks that he called *survival strategies*, which "reflect economic destitution and a failure to cope".[229] In his opinion, the sequence of coping strategies reflects a pattern of discrete stages, which reflect an "increasing desperation". First, strategies with little long-run costs, which are reversible in their consequences (i.e. low-stress or medium-stress strategies), are adopted, followed by strategies that cause higher long-run costs and that are more difficult to reverse (i.e. high-stress strategies) and finally, survival strategies which are high-risk, erosive and generally irreversible, that aim to "prevent destitution and death"[230]. As an example, Devereux mentioned permanent migration out of the village, with an unknown future, or the sale of the last (breeding) livestock.[231] In conclusion, coping strategies describe a whole array of different strategies. While most of these SRM strategies can take different forms on the continuum between low-stress strategies and survival strategies, proactive strategies being generally preferable, there is also a sig-

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[227] Ibid., pp. 407–411.
[228] Holzmann et al. (1999): Social protection as social risk management, p. 13.
[229] The terminology used by Devereux differed from the SRM framework and the stress-levels introduced by Montgomery. Devereux described a continuum of increasingly erosive strategies, from proactive, positive 'accumulation strategies' and 'adaptive strategies' to reactive and defensive 'coping strategies' and 'survival strategies'. Devereux (1999): Making less last longer, p. 11.
[230] Ibid., p. 8.
[231] Ibid., p. 12.

nificant qualitative difference in the efficiency of reactive coping strategies, as some may cause severe long-term negative impacts on households and individuals.[232]

In the context of reactive SRM strategies, it is important to note that the residual type of reactive risk management is the strategy of not reacting to the shock and remaining passive. This includes the reduction of consumption and future investments in production and education. This passive form of risk management is often used if other SRM strategies are exhausted, or if the household is incapable of actively responding to the shock.

For many households, *access to proper SRM strategies* and diversification of SRM strategies is a major problem. Public social protection schemes might be non-existent or access is restricted to formal sector employees. Also, formal arrangements are often inaccessible for households in rural areas or in the informal sector, which is the case for formal financial products (e.g. savings, credit and insurance). However, access to other informal SRM strategies is also limited. Income-based strategies (including planting high-yield crops, diversification and migration) might be limited due to constraints on entering these profitable activities, with the result that poor households engage in low-return but low-risk activities.[233] Strategies that fall in the category of self-insurance, such as asset building, might also be "limited by access to assets and poor functioning of assets markets when a crisis hits the household".[234] Risk pooling has other limitations, like the local availability of suitable (micro)insurance products, their affordability and the long-term sustainability of microinsurance schemes. Therefore, the set of SRM strategies of many households in developing countries relies on building an asset stock of locally available goods and informal risk-sharing arrangements and social capital within kin, extended family or neighborhood structures. However, poorer households have limited self-help capacities and their asset stocks are quickly depleted in case of shocks. There is also evidence that they only have access to a few other significant SRM strategies. Poor households are often even excluded from informal risk-sharing arrangements, for a variety of reasons. For example, they have more difficulties in fulfilling the reciprocal obligations and also, they have to value current consumption over future consumption; therefore poor households are more likely to drop out of risk sharing arrangements.[235] Evidence from Tanzania suggests that the rich have denser networks and risk-sharing arrangements than the poor and, therefore,

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[232] Although Cohen et al. did not distinguish between proactive and reactive strategies in their classification of low, medium and high stress coping strategies, still all high stress strategies fall into the category of reactive risk management strategies, according to the adapted SRM framework.

[233] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 28.

[234] Ibid.

[235] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 144 and 157.

may be able to better cope with their risks than poor households.[236] Hence, in the case of the poorest households, there is little doubt that SRM strategies on higher levels are required; for example, the World Bank concludes that these poorest households "may well be more efficiently helped with targeted cash transfers"[237].

Table 2 represents a matrix of possible social risk management strategies. Those strategies which are primarily used for health risk management are noted in the table with an asterisk. The table follows the typology presented in figure 1 on page 45. The vertical axis represents the typology of pro-active and re-active SRM strategies and the horizontal axis shows the level of action where the social risk management strategy takes place. As discussed in section 3.3, SRM strategies on different levels may address the same type of risk, keeping the objective of redundancy in mind.

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[236] De Weerdt, Joachim (2007): Risk-Sharing and Endogenous Network Formation. In: Dercon, Stefan [Hrsg.] (ed.): Insurance against poverty, Repr. UNU-WIDER studies in development economics. Oxford Univ. Press. Oxford [a.o.], p. 213.

[237] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 157.

Tab. 2: Social risk management strategies – matrix of response levels and strategies

Strategies	Informal mechanisms		Formal mechanisms	
	Individual or household	Group- or community-based	Market-based or non-profit sector	Publicly provided
Risk reduction or elimination	More secure income sources / less risky production Migration Preventive health practices (vaccination, hygiene, sanitation, safe drinking water, healthy and cautious living etc.)* Preventive health services (vaccination, health screening, health check-up, ante-natal care)* Proper feeding / weaning practices*	Common property resource management Collective action for infrastructure, dikes, terraces, roads, schools Efforts improving access to health care providers* Collective action for health prevention (sanitation, hygiene, vaccination, safe drinking water, waste disposal)*	Education in risk management In-service training Company-based and market-driven work safety standards* Health awareness programs* Vaccination campaigns*	Sound economic and environmental policies Labor and work safety standards, active labor marked policies Education and training Research on risks and risk assessments Disaster prevention Infrastructure (dams, roads, etc.) Public safety measures against robbery, theft, crime and corruption Health prevention (vaccination, HIV/AIDS prevention, hygiene and quality standards, other disease prevention)* Public health policies (providing health care facilities, medical equipment, drugs, health staff, etc.)*
Shock reduction or elimination	Stock of most important drugs, first aid kit Timely curing of illness to reduce more serious consequences Proactively reduce the value of the item at risk (business loss, theft), e.g. low investments, low price equipment or consumption goods Share-cropper tenancy	Local first aid (community health workers, herbalists, TBA, etc.) Cooperative emergency schemes, e.g fire brigade Responses of occupational organizations (farmers, trade associations, etc.)	Ambulance services	Emergency health care Quick disaster response National reserves of food and other goods Reducing or removing user fees for health care Subsidies on basic and goods and services in times of need
Self-insurance	Accumulating stores: Savings, assets (e.g. valuable goods, buffering stocks, etc.) Accumulating investments: Productive assets (e.g. livestock, equipment), infrastructure (e.g. estate) or rules (e.g. property rights) Accumulating claims (e.g. through mutually exchanging credit or work)	Community-based financial groups (e.g. ROSCAs)	Investment in financial assets Access to savings	Pension systems Financial inclusion programs Protection of property rights Social assistance programs, conditional or unconditional transfers, assets transfers for vulnerable and poor households Social investment funds
Portfolio diversification	Multiple jobs/ different occupations Income source diversification, e.g. combining		Financial literacy programs (Micro)finance array of services	Financial literacy programs Regulation of financial markets, microfinance

	farm and non-farm income Crop and plot diversification Seasonal migration Investing in human, physical and real assets		(savings, credit, insurance)	
Risk sharing	Marriage/family Support from extended family and relatives Remittances	Investment in social capital (social networks, rituals, reciprocal gift-giving) Risk sharing in Community-based financial groups (e.g. ROSCAs) Community assistance, illness-related arrangements Self-help groups		Unemployment insurance Mandated/provided disability, accident and health insurance*
Risk pooling		Funeral societies Community-based health insurance*	Crop, live-stock, fire and other damage insurance Old age annuities Employer-based health schemes or funds* Disability, accident, life, health and other personal insurance*	
Coping with shocks	Use of current income Dis-Saving Reallocate household resources Increase labor supply (working more hours or involving women and children) Reduce consumption Families/households move together Seasonal or temporary migration or migration to unaffected areas Change of occupation/income sources Sale of household/productive assets Take children out of school to work Divert to stigmatized or illegal income sources (theft, robbery, prostitution, etc.)	Intra-community borrowing Intra-community transfers/charity Informal borrowing (e.g. money-lenders)	Sale of financial assets Borrowing from banks and MFIs Default on loans Paying in installments at health facility*	Disaster relief Workfare programs / public works

Notes: Items with asterisk indicate social risk management strategies which are of particular relevance for health risks.
Source: Author, based on Holzmann et al. 2007 p. 9, Holzmann et al. 2001, p. 544, p. 9ff., World Bank 2001, p. 141, Rösner 2008, p. 22ff., Waelkens et al. 2005, p. 17, McKinnon 2010, p. 456.

4. Risks and social risk management in Sub-Saharan Africa

4.1. Introduction to country focus on Ghana and Malawi

Ghana is located in West Africa, had a population of about 23.69 million people and a size of 238 540 square kilometers.[238] Ghana borders Côte d'Ivoire to the west, Burkina Faso to the North, Togo to the east and the Atlantic Ocean to the South. The majority of land area (69.2%) was used for agriculture, while about half of the population (49.5%) lived in rural areas. See table 3 for an overview of country indicators for Ghana and Malawi.

Malawi, on the other hand, is a land-locked country in South East Africa with a population of about 14.57 million people and a size of 118 480 square kilometers.[239] It borders Zambia to the west, Mozambique to the south and east and Tanzania to the north and east. Agricultural land accounted for 58.1% of the land area and the vast ma-jority of the population lived in rural areas (84.6%).

As previously discussed in the introduction (section 1.1), using Ghana and Malawi for a country comparison of risk exposure and the application of social risk manage-ment strategies is suitable for several reasons, as they share several characteristics and differ in some factors of interest. Both Ghana and Malawi experienced relatively high levels of political stability, with democratic elections, and are multi-ethnic societies without major ethnic conflicts. They have economic similarities, as both economies had a considerable reliance on agricultural production, 31.81% (Ghana) and 32.06% (Malawi) of GDP, albeit Ghana operated on a significantly higher economic production level, with a GDP per capita (PPP) international-$ 2816 in 2009, compared to interna-tional-$ 814 in Malawi.[240,241]

The trade patterns of Ghana and Malawi were quite different, mostly due to Ghana's richness in natural resources. The main export goods of Ghana were gold, crude oil

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[238] Data from year 2012. The World Bank (2014): Data Ghana. URL: http://data.worldbank.org/coun-try/ghana (accessed 2014/06/15).

[239] Data from year 2012. The World Bank (2014): Data Malawi. URL: http://data.worldbank.org/coun-try/malawi (accessed 2014/06/15).

[240] values in current US$. The World Bank (2014): Data Ghana; The World Bank (2014): Data Malawi.

[241] Crude oil extraction and export started in Ghana in 2011. The crude oil industry is now one of the fastest growing industries with a growth of 37.5% (from 2013 to 2014). The data in this study have been collected before the crude oil exports started. IHS Global Insight (2014): Country Intelli-gence: Report: Ghana. In: Ghana Country Monitor, p. 4 and 14.

(since 2011) and cocoa. Ghana also exported other minerals such as bauxite, manganese ore and diamonds, while aluminum led the manufactured export goods. The main agricultural export goods besides cocoa were timber and fish. The main imports were petroleum products, manufactured capital goods and consumer goods (e.g. food, household items). Ghana had a trade deficit.[242] The exports of Malawi were more dominated by agricultural products. Malawi derived their main export earnings from the export of tobacco, which made the country dependent on seasonal fluctuations and global tobacco prices. Other agricultural export goods were tea, sugar and coffee. Also, exports of uranium have been growing in recent years. Generally, Malawi was heavily dependent on fuel imports; one reason for the country's trade deficit.[243]

Both countries were in the category 'low human development' in the Human Development Index (2010) with Ghana at a somewhat higher country ranking of 130 (index value 0.467) than Malawi at 153 (0.376) out of 169 countries.[244] At 73.7%, the literacy rate among adults was higher in Malawi than in Ghana, which had 66.6%. In general, poverty levels in Ghana were significantly lower than in Malawi. The poverty headcount ratio of having less than PPP $1.25 per day was significantly higher in Malawi (61.64%) than in Ghana (28.50%). Income disparities were similar in both countries with a Gini coefficient of 42.76 in Ghana and 43.91 in Malawi. See table 3.

Tab. 3: Basic general, economic and development indicators for Ghana and Malawi

Indicators	Ghana	Malawi
Surface area (sq. km)[1]	238 540	118 480
Agricultural land (% of land area)[1]	69.22	58.12
Population (Total)[1]	23 691 533	14 573 338
Rural population (% of total population)[1]	49.49	84.55
Annual population growth rate (%)[2]	[d]2.40	[d]3.10
GDP per capita, PPP (current international $)[1]	2816.16	813.55
GNI per capita, PPP (current international $)[1]	2810.00	790.00
Agriculture, value added (% of GDP)[1]	31.81	32.06
Industry, value added (% of GDP)[1]	19.00	18.54
Services, etc., value added (% of GDP)[1]	49.20	49.40
Borrowers from commercial banks (per 1,000 adults)[1]	33.76	16.16

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[242] Ibid., p. 14.

[243] IHS Global Insight (2014): Country Intelligence: Report: Malawi. In: Malawi Country Monitor, p. 6f.

[244] In 2013, Ghana was able to increase in the HDI to 'medium human development' (rank 135, index 0.558) while Malawi remained in the 'low human development' (rank 170, index 0.418). UNDP (2010): Human Development Report 2010. The Real Wealth of Nations. Pathways to Human Development, 2 edition. Palgrave Macmillan. New York, p. 145 and 150; UNDP (2013): Human Development Report 2013. The Rise of the South. Human Progress in a Diverse World. New York, p. 150.

Indicators	Ghana	Malawi
Depositors with commercial banks (per 1,000 adults)[1]	271.28	159.88
Human Development Index (HDI) Rank	[d]130	[d]153
GINI index[1]	[b]42.76	[d]43.91
Poverty headcount ratio at $2 a day (PPP) (% of population)[1]	[b]51.84	[d]82.31
Poverty headcount ratio at $1.25 a day (PPP) (% of population)[1]	[b]28.59	[d]61.64
Poverty headcount ratio at national poverty line (% of population)[1]	[b]28.50	[d]50.70
Literacy rate among adults aged >= 15 years (%)[2]	66.60	73.70
Female headed households (% of households with a female head)[1]	[c]33.70	[d]28.10

Notes: Data are from year 2009 if not indicated otherwise. a=2004, b=2006, c=2008, d=2010
Sources: 1= The World Bank Data, 2=World Health Organization Global Health Observatory Data Repository.[245]

There are significant cultural differences between Ghana and Malawi and both countries had a very different colonial experience; however, many institutions in both countries have some influence from their British colonial origins.[246] Ghana regained independence in 1957 and Malawi in 1964. Since then, Ghana's and Malawi's history of approaching health risks on a macro level has been very different. While Malawi continued to follow the path of a publicly funded health system without fees for essential services at public health care facilities, Ghana has more frequently changed their financing system: First, after independence Ghana aimed for free health care services, later introduced user fees at point of service and started a National Health Insurance Scheme (NHIS) in 2003. See sections 4.3.6.1 and 4.3.6.2 for a more comprehensive view on the health care financing systems of Ghana and Malawi.

The identified vulnerable groups are quite similar in both countries. Based on an analysis of the Ghana Living Standard Survey IV, thirteen most vulnerable groups were identified. Among these were rural agricultural producers, people with chronic illnesses (incl. HIV/AIDS), displaced communities (e.g. due to flooding, droughts), residents of urban slums, etc.[247]

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[245] World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics. URL: http://apps.who.int/ghodata/?theme=country (accessed 2012/10/03); The World Bank (2014): Data Ghana; The World Bank (2014): Data Malawi.

[246] Ghana has subsequently become a colony with pre-colonial experiences ranging back at least to the 17th century when several European countries were constructing forts as trade posts at the Ghanaian Gold Coast that were heavily involved in slave trade since the late 17th century. In 1820, the British Colonial Office took over the trade posts and South Ghana was declared British Crown Colony in 1874. Ghana became independent in 1957. On contrary, Malawi was a colony only for a short time period (from 1891 when it became a British protectorate until 1964). British colonial rule in Malawi started only after Great Britain had abolished slave trade.

[247] Entire list of vulnerable groups: rural agricultural producers, children in difficult circumstances, people living with HIV/AIDS, displaced communities, disadvantaged women, residents of urban slums, the elderly, physically challenged persons, people with chronic diseases, drug addicts, vic-

In a poverty analysis in Malawi by the World Bank, four most vulnerable groups in Malawi were identified: "rural households with small landholdings, female-headed households, AIDS orphans and their relatives, and those who could not care for themselves"[248]. For these groups, the four major risks were "seasonal price increases and food shortages, periodic drought, large periodic macroeconomic shocks, and the threat of HIV/AIDS"[249].

4.2. Risks, risk exposure and vulnerability in Sub-Saharan Africa

Many developing countries have a comparatively high risk profile. Part of this high risk exposure is due to the adverse geography of these countries. Tropical or subtropical climate increases the risk of parasitic or tropical diseases, including malaria. It increases the risk of extreme weather conditions and climate-related natural disasters.[250] Moreover, many developing countries show characteristics of over-proportionally high risk exposure to a variety of other "man-made" risks, ranging from economic, social and political instabilities and inefficiencies to environmental disasters. Additionally, natural disasters such as tsunamis for coastal areas, earthquakes or volcano eruptions add to the high level of risk exposure. However, as previously discussed, pure risk exposure does not necessarily translate into high vulnerability to shocks, which is rather a function of risk exposure, social risk management capacities on all levels and economic situation.

4.2.1. General risk exposure and vulnerability in Sub-Saharan Africa

Looking at disaster risk in Africa "illustrates the dynamic interplay between naturally-occurring hazard processes and the continent's wide-ranging vulnerability conditions".[251] Hence, the negative impact of shocks is less an outcome of risk exposure itself than an expression of the human or country's internal vulnerability.[252] As reported by Bhavani et al. (2008), Sub-Saharan Africa (SSA) is not the region with the highest risk

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tims of abuse, victims of harmful traditional practices, unemployed. Government of Ghana (2003): Ghana Poverty Reduction Strategy 2003-2005. An Agenda for Growth and Prosperity. Volume I. Analysis and Policy Statement, p. 114f.

[248] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 147.

[249] Ibid.

[250] Todaro, Michael P.; Smith, Stephen C. (2008): Economic Development, 10 (rev.) edition. Pearson Longman. Harlow, U.K., p. 66f.

[251] Holloway, Ailsa (2012): Disaster risk in Africa: Dynamic discourse or dysfunctional dialogue? In: Bloemertz, Lena; Doevenspeck, Martin; Macamo, Elisio; et al. (eds.): Risk and Africa. Multi-Disciplinary Empirical Approaches. Berlin, p. 22.

[252] cp. Ibid., p. 23.

exposure, but it is "the most vulnerable to disasters because of physical, social, economic and environmental factors that negatively affect the capacity of people to secure and protect their livelihoods."[253] Particularly, weather and climate shocks, as well as natural disasters, pose a severe threat on households' livelihoods in SSA, because the majority of households live in rural areas and are heavily dependent on agricultural production.[254] Bhavani et al. further laid out that large-scale risk exposure has been constantly increasing in SSA from 1985 to 2006, naming floods (25%), droughts (18%), and windstorms (7%) as the largest natural disasters, though "epidemics, famine, insects" (46%) accounts for the largest share.[255] This list did not include the "regular" burden of disease in SSA, which was at a comparably high level in terms of communicable and, increasingly, chronic non-communicable diseases (CNCDs).

In a thorough look at the context of risk coping in Malawi, Devereux (1999) described three types of risks and related shocks to which people are exposed. First, he described random shocks, which are mainly unpredictable and randomly occurring, such as price shocks, flood, drought or illness. Second, he described *regular shocks* which are predictable (e.g. seasonal risks), but unknown in their severity. Third, he described *processes*, which correspond to stressors as introduced in section 2.2, that mean a steady increase of pressure on the household, e.g. resulting from a decline of soil fertility or a steady rise in food and commodity prices. The first two types require typical risk management strategies, with the second allowing for more planning and proactive strategies, while the third type mainly required adaptive behavior.[256]

Particularly in rural Malawi, regular shocks and random shocks are sometimes difficult to differentiate. About 85% of Malawians live in rural areas and the majority of them work small-scale farmland, with less than one hectare of land. Due to regular droughts, irregular rainfall during the rainy season and little use of irrigation systems, exposure to crop failure and food shortages is relatively high.[257] Generally, predominantly agricultural societies are highly dependent on price variability of inputs and

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[253] Bhavnani, Rakhi; Owor, Martin; Vordzorgbe, Seth; et al. (2008): Status of Disaster Risk Reduction in the Sub-Saharan Africa Region. January 2008. United Nations International Strategy for Disaster Reconstruction. Worldbank. no place, p. 1.

[254] The World Bank (2012): Managing Risk, Promoting Growth. Developing Systems for Social Protection in Africa. Social Protection Strategy. World Bank. Washington, D.C., p. 2. URL: http://siteresources.worldbank.org/INTAFRICA/Resources/social-protection-full-report-EN-2012.pdf (accessed 2014/02/03).

[255] Bhavnani et al. (2008): Status of Disaster Risk Reduction in the Sub-Saharan Africa Region. January 2008, p. v and 2.

[256] Devereux (1999): Making less last longer, p. 17.

[257] Flory et al. (2009): The Poor and Their Management of Shocks, p. 6; Diagne, Aliou; Zeller, Manfred (2001): Access to Credit and Its Impact on Welfare in Malawi. International Food Policy Research Institute. Washington, D.C., p. 6.

crops which increases their vulnerability.[258] For example, a study by Diagne et al. (2001) showed that price variations of crops can have a negative impact on households. They concluded that "the price of maize has a significant and negative direct impact on per capita calorie intake".[259] The analysis by Devereux (1999) gave a similar picture, where he described agricultural production risks, price fluctuations/increases in food, inputs and commodities as well as labor market risks as dominant sources of risk in Malawi. While the first mainly affected rural households, the latter two also affected urban households. Particularly, urban households were dependent on labor markets and vulnerable to price shocks, but a large share of rural households were also dependent on the labor market, as they engaged in agricultural and non-agricultural short-term employments, usually in the form of piecework, to complement farm income.[260]

In a household survey in Malawi in 2008, Flory et al. (2009) analyzed the most frequently experienced shocks that led to a reduction in income among rural households in Central Malawi.[261] In that study, using a twelve months recall period, 96% of households reported at least one shock and 56% reported three or more shocks. The most frequently mentioned shocks fell into the categories of economic shocks, natural/environmental shocks, and health shocks. Social shocks were reported less often. Among the most frequently mentioned economic shocks were death/theft of livestock or poultry (56% of households that reported shocks)[262], followed by large rise of food prices (47%), unexpected increase in input prices (34%), large fall in sale prices for crops (29%), business failure (15%) and loss of salaried employment (2%). Shocks due to natural/environmental risks were reported as low crop yields due to drought, flood or crop diseases (27%) and damaged/destroyed dwellings by fire or flood (5%). Health shocks (illness/accident) of household members (39%) and death of household members (10%) were reported as life-cycle risk. Social risks reported were theft (12%), end of regular assistance, aid or remittance (11%), break-up of the household (3%), and communal fights (2%).[263] 72% of total shocks were reported to have had some severity as they "directly lowered household incomes"; livestock or poultry losses were above average at 85%

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[258] Morduch, Jonathan (1994): Poverty and Vulnerability. In: The American Economic Review, vol. 84, nr. 2, p. 221.

[259] Diagne et al. (2001): Access to Credit and Its Impact on Welfare in Malawi, p. xii.

[260] Devereux (1999): Making less last longer, pp. 17–22.

[261] Flory et al. excluded life-cycle events/risks such as births, weddings, school graduations, funeral from their study. Flory et al. (2009): The Poor and Their Management of Shocks, p. 14.

[262] The categories of the study did not allow distinguishing between death and theft of livestock/poultry. Theft would be categorized as social risk rather than economic risk, according to table 1 on page 20.

[263] Flory et al. (2009): The Poor and Their Management of Shocks, p. 14f.

and illness/accident of a household member that lowered household incomes at 67%, out of the total of this type of shock.[264]

The characteristics of certain types of risks are more covariant than others, as reported by Flory et al. (2009). Economic risks, such as increases of food prices, were reported by over 50% of respondents to be covariant, while livestock or poultry losses had some level of covariance (32%). On the other hand, illness and accidents were predominantly reported to be idiosyncratic (96%).[265]

4.2.2. Health risks and burden of disease in Sub-Saharan Africa with particular focus on Ghana and Malawi

By international comparison, individuals and households in Sub-Saharan Africa are over-proportionally exposed to a variety of communicable and non-communicable diseases. Generally, the burden of disease is inequitably higher in low-income countries, but in Africa, certain health indicators are particularly low. For example, child mortality rates (0-4 years) and adult mortality rates (15-49 years) are higher compared to other low- and middle income countries in other regions; while high income countries are lowest in all mortality figures. The same patterns hold true in the prevalence rates of moderate and severe illnesses, as well as DALYs, where African countries fare the lowest, followed by low- and middle income countries in other regions.[266] For many years, communicable diseases were the main cause of disease in low-income countries, but recent years have seen an increasing burden of chronic non-communicable diseases, such as cardiovascular disease, diabetes, cancer and chronic pulmonary diseases.[267]

The comparison between Ghana and Malawi concerning important health indicators and the burden of disease shows some significant differences. In Ghana, life expectancy at birth has remained quite stable over the last twenty years and was at 60 years (in 2009).[268] By comparison, in Malawi, the life expectancy at birth was much lower in 2009 (at 47 years), which was actually a decrease from 48 years in 1990. This comparably low level of life expectancy could be attributed, to a large extent, to the

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[264] Ibid., p. 15.

[265] Ibid., p. 16.

[266] WHO (2004): The Global Burden of Disease. 2004 Update. World Health Organization. Geneva, p. 15 and 17f. (on mortality rates), 33 (prevalence), 41 (DALYs).

[267] Boutayeb, Abdesslam (2006): The Double Burden of Communicable and Non-Communicable Diseases in Developing Countries. In: Transactions of the Royal Society of Tropical Medicine And Hygiene, vol. 100, nr. 3, p. 192.

[268] World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics, Year of measurement 2009.

HIV/AIDS crisis. The lowest life expectancy was reached in 2000, when life expectancy at birth was at 43 years.[269]

Comparing the DALY rates per 100 000 population of Ghana and Malawi (see table 4), the burden of disease in Malawi and Ghana was comparable with regard to most causes, but with some significant differences. Aggregating over all causes, the total burden of disease (as indicated by DALYs) was higher in Malawi, at 58 748, than in Ghana, at 34 141.

The difference almost exclusively stemmed from the first main category "Communicable, maternal, perinatal and nutritional causes", in which, at 46 845, Malawi had more than double the DALY rates as Ghana (21 124). In Malawi, this disease category also accounted for the majority of causes of death with 65.1%, which was higher than Ghana with 50.7%.[270]

While there was a variance in most cause categories, the DALYs of HIV/AIDS were much higher in Malawi (14 443) than in Ghana (2592). This is not surprising, since the median prevalence rate of HIV in Ghana was 2.1% in 2011, relatively low compared to many other Sub-Saharan countries.[271] In comparison, Malawi has been in the center of the HIV/AIDS crisis and still had a prevalence among adults of 10.6 % in 2010.[272] In line with the prevalence rate, HIV/AIDS was a major cause of death in Malawi with 337 deaths per 100 000 population compared to 74 in Ghana.[273]

Also, the DALY rates of diarrheal diseases in Malawi were 5231, more than double the rate of Ghana, which was 2063. This difference could only be partially attributed to potable water access and sanitation. The difference with regard to these variables was quite small: In 2010, 84.60% of the population had access to improved water sources in Ghana compared to 81.30% in Malawi. Similarly, in Ghana, 13.73% of the population had access to improved sanitation facilities compared to 10.26% in Malawi.[274]

The burden of disease from malaria was similar in both countries, but was at a high level with a DALY rate of 4186 in Ghana and 4809 in Malawi. Malaria significantly

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[269] Ibid.

[270] Data from 2012. The World Bank (2014): Data Ghana; The World Bank (2014): Data Malawi.

[271] Ghana AIDS Commission (2012): Ghana Country AIDS Progress Report. Reporting Period January 2010 - December 2011, p. 22. URL: http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce_GH_Narrative_Report%5B1%5D.pdf (accessed 2012/10/04).

[272] Government of Malawi (2012): 2012 Global AIDS Response Report. Malawi Country Report for 2010 and 2011, p. 2. URL: http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce_MW_Narrative_Report%5B1%5D.pdf (accessed 2012/10/04).

[273] Data for 2009. The confidence interval for Ghana is [59-90] and for Malawi [250-436]. World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics.

[274] The World Bank (2014): Data Ghana; The World Bank (2014): Data Malawi.

caused more deaths in Malawi, 87 deaths per 100 000 population per year, than in Ghana with 48 deaths per 100 000.[275]

The large difference in respiratory infections could be mostly attributed to lower respiratory infections in Ghana (1874), which were over three times lower than in Malawi (6866). Also, the DALYs of maternal conditions were almost three times as high in Malawi (3062) compared to Ghana (1193).[276] Again, this could not be explained from other typical indicators, such as the rate of births attended by skilled health personnel, which at 71.3% (2010) was higher in Malawi than in Ghana, at 54.7% (2008). However, with regard to the maternal mortality ratio, Malawi reported to have a significantly higher death rate at 460 than Ghana, which had 350 deaths per 100 000 live births.[277] In a report on the achievements for the Millenium Development Goals, the government of Malawi enumerated several factors that led to bad maternal health indicators, particularly the insufficiencies of skilled health personnel, poor access to essential health care services as well as inadequate and poorly equipped health facilities with the unavailability of basic essential drugs.[278]

Tab. 4: Estimated DALYs per 100 000 population by cause: Ghana, Malawi (2004)

Causes	Ghana	Malawi
I. *Communicable, maternal, perinatal and nutritional conditions*	*21 124*	*46 845*
A. Infectious and parasitic diseases	12 705	30 389
1. Tuberculosis	1091	1224
2. STDs excluding HIV	363	429
3. HIV/AIDS	2592	14 443
4. Diarrhoeal diseases	2063	5231
5. Childhood-cluster diseases	419	350
6. Meningitis	195	620
7. Hepatitis B / C	60	105
8. Malaria	4186	4809
9. Tropical-cluster diseases	1002	1032
10. Leprosy	3	3
11. Dengue	0	6

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[275] Data from 2008. The confidence interval for Ghana was [24-61] and for Malawi [66-111] World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics.

[276] Ibid.

[277] Data are inter-agency estimates. Year 2009. The confidence interval for Ghana was [210-630] and for Malawi [290-710]. Ibid.

[278] Ministry of Development Planning and Cooperation Malawi (2011): 2010 Malawi Millennium Development Goals Report, p. 36f.

13. Trachoma	2	36
14. Intestinal nematode infections	283	138
B. Respiratory infections	1912	6965
C. Maternal conditions	1193	3062
D. Perinatal conditions	4605	3743
E. Nutritional deficiencies	709	2685
II. Noncommunicable diseases	*10 510*	*8850*
A. Malignant neoplasms	845	621
B. Other neoplasms	28	31
C. Diabetes mellitus	193	203
D. Endocrine disorders	225	301
E. Neuropsychiatric conditions	3006	2359
F. Sense organ diseases	1347	1195
G. Cardiovascular diseases	1807	1483
H. Respiratory diseases	829	820
I. Digestive diseases	621	520
J. Genitourinary diseases	262	212
K. Skin diseases	178	110
L. Musculoskeletal diseases	352	298
M. Congenital anomalies	734	612
N. Oral conditions	83	85
III. Injuries	*2508*	*3054*
A. Unintentional injuries	1937	2310
B. Intentional injuries	570	744
Total	*34 141*	*58 748*

Source: World Health Organization (WHO) (2009)[279]

Nutritional deficiencies caused a higher burden of disease in Malawi (DALY rate at 2685) than in Ghana (709), across all sub-categories: protein-energy malnutrition, iodine deficiency, vitamin A deficiency and iron-deficiency anemia.[280] Another indicator backed up this difference: the prevalence of undernourishment in Malawi was 23.10% of the population, compared to 5.80% in Ghana, in 2009. On the other hand, the malnutrition prevalence among children under 5 years was slightly lower in Malawi (12.10% in 2009) than in Ghana (14.30% in 2008).[281]

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[279] World Health Organization (WHO) (2009): WHO Disease and injury country estimates: Death and DALY estimates for 2004 by cause for WHO Member States, Persons, all ages, WHO. URL: http://www.who.int/healthinfo/global_burden_disease/estimates_country/en/index.html (accessed 2012/10/03).

[280] Ibid.

[281] The World Bank (2014): Data Ghana; The World Bank (2014): Data Malawi.

With regard to the second main category *Noncommunicable diseases* (NCD) in table 4, Ghana showed a significantly higher burden of disease (DALY rate of 10 510) compared to Malawi (8850). Particularly, malignant neoplasms, neuropsychiatric disorders and cardiovascular diseases accounted for this difference. As higher age was a risk factor for most of these diseases, particularly for chronic noncommunicable diseases (CNCD), it could be assumed that the relatively higher mean age of the Ghanaian society compared to the Malawian society influenced these figures. As expected, the difference between Ghana and Malawi diminished when looking at the age-standardized DALY rates for NCDs, which were 13 365 in Ghana and 13 057 for Malawi.[282]

Between 1990 and 2010, Ghana and Malawi significantly improved the health indicators of children. In Ghana, the under-five mortality rate (probability of dying by age 5 per 1000 live births) was gradually reduced from 12.2 in 1990 to 7.4 per 100 children under five years in 2010. In Ghana, malaria was responsible for most deaths among children under five years due to a single illness (18 %), directly followed by prematurity (16%), pneumonia (13%) and birth asphyxia (11%).[283] In Malawi, the reduction of the under-five mortality rate was from 22.2 per 100 children in 1990 to 9.2 in 2010.[284] Pneumonia was responsible for most deaths among children under five years, due to a single illness (14%), directly followed by malaria (13%), HIV/AIDS (13%) and prematurity (13%).[285]

In conclusion, the burden of disease for communicable and maternal diseases in Malawi was higher than in Ghana, particularly due to HIV/AIDS, diarrheal diseases, lower respiratory infections and maternal conditions. Both countries had a high burden of disease from malaria. In Ghana, the burden of disease from non-communicable diseases was higher, which was largely a result of the higher life expectancy and higher average age of the population in Ghana.

4.3. Social risk management in Sub-Saharan Africa

Multiple levels – from individual to the global – are involved in social risk management. Besides public actors (local, regional and national governments), individuals, households, communities as well as market-based or non-profit institutions are actors

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[282] Comparing the DALY rates with the age-standardized DALY rates, only the category 'II. Noncommunicable diseases' showed a significant change, while the other cause categories did not significantly change. World Health Organization (WHO) (2009): WHO Disease and injury country estimates: Death and DALY estimates for 2004 by cause for WHO Member States, Persons, all ages.

[283] World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics, Year of measurement 2010.

[284] Ibid., Year of measurement 2009.

[285] Ibid., Year of measurement 2010.

in social risk management. The typology of SRM strategies, as shown in figure 1 on page 45, depicts all possible types of SRM strategies. This section, on the other hand, provides an overview of SRM strategies being applied in the societies of Sub-Saharan Africa. In a first step, it will be shown that SRM strategies are not necessarily applied by households in a linear order. After that, the SRM strategies for which evidence exists, are presented loosely following the logic of figure 1, starting first with individual and household strategies (micro-level) and then continuing with strategies on the community level (meso-level) and moving from proactive to reactive strategies.

Devereux (1999) analyzed a wide array of SRM strategies in rural and urban Malawi, with a focus on those strategies that involve interactions with other households. According to Devereux, SRM strategies are generally not adopted in a one-dimensional linear sequence, but rather "in multiple, iterative layers; several discrete strategies are adopted in parallel and each is pursued with increasing intensity at increasing cost or irreversibility as conditions deteriorate, until ameliorated by a positive countervailing event".[286] A typical behavior describing the iterative layers of SRM strategies in the words of Devereux:

"Neighbours who occasionally lend sugar or salt are now asked for interest-free loans. The wealthy headman who extracts unpaid labour as tribute from community members is called upon to release some of his surplus grain to villagers who have no food. The brother who works as a cleaner in town and occasionally remits clothes is expected to bring a bag of maize next time he visits the village."[287]

Iterative and frequent reciprocal interactions are an integral part of households' sets of SRM strategies in Sub-Saharan Africa.[288] Therefore, some frequent SRM strategies are difficult to fit into the dichotomy of proactive and reactive strategies, when only looking at the type of strategy. Among such strategies which can be proactively and reactively applied are borrowing and informal credit arrangements, transfers or gifts and sale of assets.

A study on risk management strategies, conducted by Flory et al. (2009) in Malawi, exemplified the complexity of sets of SRM strategies in a low-income setting. For the Malawian context, Flory et al. presented strong evidence of the typical SRM strategies of risk-sharing, such as reciprocal gift-giving in the community (friends or relatives).

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[286] Devereux (1999): Making less last longer, p. 16.

[287] Ibid.

[288] cp. The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I, p. 16; Schindler, Kati (2010): Credit for what? Informal Credit as a Coping Strategy of Market Women in Northern Ghana. In: Journal of Development Studies, vol. 46, nr. 2, p. 10.

Informal borrowing is another typical, mostly reactive, strategy. In the study by Flory et al. (2009) four SRM strategies were used significantly more often than other strategies. The strategy used to cope with a shock was predominantly the use of cash savings, in 70.61% of all shocks (including cash stored at home, at a friend's place, in RoSCAs or bank account), followed by increased working hours (6.62%), sale of animals (5.83%) and increased sale of crops (3.66%). Other strategies accounted for 13.3%. In these other strategies, some can be categorized as high-stress strategies that can cause long-term negative effects on the household, following the classification by Montgomery from 1996 (see categorization in section 3.3): Sale of physical assets (tools, furniture, etc.) (0.70% of all shocks), borrowing from money lender (0.24%), reduced food consumption (0.22%), temporary migration (0.22%), stopped business (0.20%), rented out farmland (0.20%), sold farmland (0.18%), previously non-working household members started working (0.12%), removed children from school to work (0.04%).[289]

In summary, out of all households experiencing shocks, Flory et al. (2009) classified 12.14% of households as having used high-stress coping strategies, 70.93% having used only medium- or low-stress coping strategies. Another 16.93% of households did not use any SRM strategy for the experienced shocks.[290] Additionally, households using high-stress coping strategies were slightly less food secure, were likely to experience a larger number of shocks, have more likely outstanding informal loans, live more likely in rural areas and have a slightly higher average family size than other households.[291] Flory et al. (2009) also showed that access to formal financial products and social networks decreased the likelihood of using high-stress coping strategies.[292] It is important to note that Devereux et al. (1999) and Flory et al. (2009) calculated very different frequencies of using of high-stress coping strategies. One reason for this could have been that the sampling technique applied by Devereux explicitly focused on the selection of a very poor urban setting and rural communities, which were known to be food-insecure.[293] A more detailed discussion on high-stress SRM strategies, which Devereux called 'erosive' strategies, follows in the subsequent section 4.3.1.

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[289] Flory et al. (2009): The Poor and Their Management of Shocks, p. 18f.
[290] Ibid., p. 21.
[291] Ibid., p. 24ff.
[292] Ibid., p. 35.
[293] Devereux (1999): Making less last longer, p. 42.

4.3.1. Social risk management on individual and household level in Sub-Saharan Africa

In his study on informal safety nets in Malawi, Devereux described several SRM strategies on the individual and household levels. In rural Malawi, he reported income diversification and increase of labor supply as principal SRM strategies. Households frequently supplemented income from their own small-scale agricultural production with casual non-farm or farm labor income (in cash or in-kind) in the form of piecework; activities which households typically increased in difficult times.[294] Although this additional labor income is a form of income diversification, it is a weak SRM strategy for several reasons. First, paid farm labor directly competes with their own farming activities, because planting and harvesting times are overlapping, so that today's labor income reduces future crop earnings from owned farm land. Second, wage levels for piecework are comparatively low. Third, the size of labor markets for piecework is often parallel in relation to their own good or bad harvests, which reduces their suitability as SRM strategies in the times when they are needed most. However, there are also reports that wealthy farmers "feel some moral obligation to hire more [...] than they actually need when faced with people begging for work."[295] Such cases involve some redistributive effect in times of need.

In his analysis, Devereux noted substantial differences in sets of SRM strategies between rural and urban areas, but also similarities. For example, diversification in agricultural and non-agricultural income was not a rural phenomenon, as it was also common in urban areas. In Malawi, the majority of urban households practiced agricultural activities in rural areas, in addition to urban income generation. Additionally, assisting relatives in rural areas with harvesting activities was common among urban residents.[296]

Devereux also reported that gender roles have changed and income diversification patterns with it. Women in Southern Malawi were increasingly economically active and derive income for the household, e.g. from trading or sale of cooked food.[297] For regions bordering on foreign countries, informal cross-border trade of commodities and labor were a significant strategy for the income-earning of households.[298] Generally,

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[294] Particularly, farm labor income may be problematic, because it directly competes with their own farming activities since planting and harvesting times tend to be at the same time. Ibid., p. 24.

[295] Ibid., p. 27.

[296] Ibid., p. 33.

[297] Ibid., p. 24.

[298] Cross-border trade benefits from relative comparative advantages of the countries. Particularly in crises, informal cross-border has been intensified. For example, in the Malawian petrol crisis in 2009, illegal petrol trade from Mozambique significantly contributed to income. Ibid., p. 27f.

urban areas allowed more income-diversification possibilities than rural areas, which included different informal sector employments, street vending as well as stigmatized and illegal activities (e.g. prostitution, theft, sale of smuggled or stolen goods).[299] However, overall income diversification levels in Malawi were quite low when compared internationally, as the average share of non-agricultural income was just 34% in 1991.[300]

Income diversification is dependent on a sufficient labor supply. Hence, the combination of increased labor supply and increased income diversification, can either serve as proactive or reactive SRM strategies. To some extent, increased labor supply is a normal variation depending on income earning possibilities or increased need. A deliberate increase in income diversification (and labor supply) can be proactively used to mitigate the impact of future income shocks, as the household decreases its dependency on one income source, and with it its vulnerability to these income shocks. On the other hand, an increase in labor supply and earning income from different sources is also a typical reactive SRM strategy, in order to compensate for the losses or costs involved with a certain shock ex-post. Increased labor supply can involve an increase in working hours of the breadwinners in the household, as well as an addition of more household members serving as income earners. In its typical form, there are only minor secondary (long-term) negative impacts on the households, as long as this additional work (in its type and extent) does not overly endanger the physical or mental health of household members or the future capabilities of children. It is not uncommon for children to be taken out of school to join the labor market or to replace working adults in household chores.[301] In about 10% of urban Malawian households, Devereux identified children that were sent "to look for money" and about 9% where they were taken out of school; on the other hand, both practices were not common in rural areas of Malawi (0%).[302]

Similar to increased labor supply and income diversification, the SRM strategies *accumulation of assets* and *sale of assets* are important strategies for both pro-active self-insurance and reactive coping. For example, ownership of livestock, such as cattle, sheep or goats, is a form of in-kind savings throughout Africa. Devereux (1999) noted that livestock was kept for several reasons and that "livestock sales are a standard coping response by households to food shortage".[303] As already noted in section 3.3 describing the SRM framework, returns of livestock sales may be low or negative which

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[299] Ibid., p. 34.
[300] The World Bank (2001): Attacking Poverty. World Development Report 2000-2001, p. 142.
[301] Devereux (1999): Making less last longer, p. 34.
[302] Ibid., p. 51.
[303] Ibid., p. 29.

reduces their effectiveness as SRM strategy. This is particularly problematic for poor households who have to sell livestock for risk-coping during community-wide shocks (e.g. seasonal drought), because at such times livestock asset prices are generally low.[304] As Sauerborn et al. (1996) reported in Burkina Faso, households were aware that "selling livestock under pressure would lead to a bad price"[305] and therefore tried to pursue intermediate SRM strategies, such as temporary loans, until livestock prices increased. In empirical data for Malawi from 1999, Devereux reported that the sale of assets in times of crisis was very common. For example, over 10% of households sold livestock or poultry to generate cash and over 10% of urban households (over 5% in rural areas) sold household items for cash generation. Renting out land was also commonly practiced by about 7% of urban households and about 4% of rural households.[306]

The reduction of consumption is one of the most practiced reactive coping strategies on the household level. This strategy can entail the replacement of higher quality with lower quality products (e.g. food, housing, water sources, etc.), the replacement of purchases through (less efficient) self-production or work (e.g. substitution of purchased fuel/charcoal with self-collected firewood or the replacement of transportation with walking), or a reduction in the quantity of consumed goods. Dietary changes are one typical type of consumption reduction. In Malawi, Devereux (1999) reported that dietary changes were an almost universal risk coping strategy in rural areas. While some dietary adjustments were generally not followed by negative secondary shocks (e.g. using different or cheaper ingredients), others might imply negative future consequences and could be counted to be 'erosive strategies', particularly concerning children's development and physical strength (ultimately resulting in frailty to diseases). Among these dietary adjustments were eating fewer meals or serving smaller portions.[307] Devereux (1999) found that over 90% of households in rural areas have applied such critical dietary adjustments, such as fewer meals a day and smaller portions, compared to less than 50% of households in urban areas.[308] The reduction in other non-food consumption, particularly the reduction of firewood or paraffin purchases, was reported by over 80% of rural and over 60% of urban households. A shift to less secure water sources was reported by over 30% of urban households (0% rural households).[309]

Seasonal migration is a typical risk-coping strategy of households. In this scenario, the breadwinners in the family migrate to other parts of the country, or abroad, for

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[304] Dercon (2007): Risk, Insurance, and Poverty: A Review, p. 15f.
[305] Sauerborn et al. (1996): Household Strategies to Cope with the Economic Costs of Illness, p. 294.
[306] Devereux (1999): Making less last longer, p. 51.
[307] Ibid., p. 29.
[308] Ibid., p. 51.
[309] Ibid.

better income-earning potential. In times of food stress, rural families use a similar mechanism, when they send their children to wealthier relatives, or to relatives in urban areas, where the food is less scarce. Devereux reported this strategy was used by over 10% of households in Malawi in an analysis of his 1999 data.[310] The SRM strategy of migration reaches its erosive state when, for example, children are sent as servants to wealthier families or to early marriages.[311]

4.3.2. Social risk management on community-level and market-based SRM strategies in Sub-Saharan Africa

Apart from individual and household-level SRM strategies, community-based strategies play a particularly important role in risk management. In Sub-Saharan Africa, there is evidence of a wide variety of informal, community-level risk management arrangements. As Sommerfeld et al. (2002) pointed out, such community-based arrangements were still widely used, but they were under pressure and even reported to be in "demise in the process of individualization and formalization of transactions, as a result of increasing monetarization".[312] A study from 1988 in Burkina Faso indicated a high significance placed on family, friends, neighbors, clans and kinship networks, as it was reported that over one fourth of total income was contributed to these networks and somewhat less than one fourth of income was received from them.[313] According to Bhattamishra et al. (2010) they serve as risk-sharing arrangements, but limitations were also reported, such as their overall risk managing capacities, difficulties with co-variate shocks, small risk pools and social exclusion.[314] On the other hand, Bhattamishra et al. mentioned as advantage of community-based SRM strategies that they are decentralized, accessible to low-income households and that they function through "a combination of effective peer monitoring, fear of social sanctions as well as repeated interactions over time between the same individuals".[315] Most informal risk-sharing arrangements are rooted in the close relationships of families, clans, kinship, friends, peers or neighbors. Assistance for individuals or households in times of shock or times of need is based on an expectation of reciprocity, solidarity and moral obligation.[316]

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[310] Ibid.
[311] Ibid., p. 31.
[312] Sommerfeld et al. (2002): Informal risk-sharing arrangements (IRSAs) in rural Burkina Faso, p. 149.
[313] Ibid., p. 150.
[314] Bhattamishra, Ruchira; Barrett, Christopher B. (2010): Community-Based Risk Management Arrangements: A Review. In: World Development, vol. 38, nr. 7, p. 930.
[315] Ibid., p. 924.
[316] Sommerfeld et al. (2002): Informal risk-sharing arrangements (IRSAs) in rural Burkina Faso, p. 158f.

Bhattamishra et al. (2010) reported several community-based preventive SRM strategies for *risk reduction and elimination.* This included, for example, pest and pathogen control in medical and veterinary care, immunization programs, deworming and sanitation programs, potable water infrastructure (e.g. wells, sewage disposal), irrigation systems, and community-based information systems. Many of these preventive measures show a significant effect of positive externalities within and between communities.[317] Although there are also preventive actions on the individual and household levels, they are not well documented. An example for risk prevention strategies on the individual level is the burning of field vegetation and pastures in order to eliminate or keep away snakes and rodents.[318]

Different types of community-based arrangements for pro-active risk management that aim *to limit the extent of the shock* are reported for Sub-Saharan Africa. According to Sommerfeld et al. (2002) fire associations and sea rescue associations are prevalent in West Africa.[319] In Uganda, informal ambulance services, called engozi, exist. Particularly in South-Western Uganda, most people belong to such a scheme that provides transportation to hospitals for the sick.[320] Another example for this SRM strategy, which is common in Sub-Saharan societies, is a rapid meeting in the extended family or community, by the so-called therapy managing group, consisting of clansmen, other kinsmen and friends, who decide on necessary steps and approaches of treatment for a sick individual.[321]

Several community-level arrangements exist that enable households to self-insure, in the sense of the terminology introduced in the adaptation of the SRM framework in section 3.3. Bhattamishra et al. (2010) described several forms of savings, as well as production or investment credit, with the aim of building future assets. An example is cereal banks in Africa (particularly the Sahel), which aim to provide in-kind savings in grains, seeds loans and storage facilities, with the ultimate goal to reduce (seasonal) commodity price fluctuations.[322] Another common form is the rotating savings and credit association (RoSCA) or accumulating savings and credit association (ASCA). The first type, RoSCA, refers to "informal associations of people who make regular monetary or non-monetary contributions to a fund which is given to each contributor in ro-

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[317] Bhattamishra et al. (2010): Community-Based Risk Management Arrangements, p. 927f.
[318] Sommerfeld et al. (2002): Informal risk-sharing arrangements (IRSAs) in rural Burkina Faso, p. 150.
[319] Ibid., p. 149f.
[320] Musau, Stephen N. (1999): Community Based Health Insurance. Experiences and Lessons Learned from East and Southern Africa. PHRplus (Partners for Health Reformplus), USAID. Bethesda, MD, p. 4. URL: http://pdf.usaid.gov/pdf_docs/PNACH317.pdf (accessed 2011/09/01).
[321] Edgerton, Robert B. (1980): Traditional Treatment for Mental Illness in Africa. A Review. In: Culture, Medicine and Psychiatry, vol. 4, nr. 2, p. 170.
[322] Bhattamishra et al. (2010): Community-Based Risk Management Arrangements, p. 925f.

tation"[323], either randomly or in a predefined turn. The second type, ASCA, refers to regular contributions to a pool, which can be used more flexibly, either as normal savings, as loans within the group or as a common pool to pay for shocks in a member's household.[324] Hence, both can serve risk management purposes, while ASCAs have, due to a common permanent fund, more potential as SRM strategy, RoSCAs also allow for financial support for a member of the association facing a shock. In such situations, RoSCAs allocate the funds out of turn to the member in need, extra collections are started, or assistance of group members beyond the association's purpose are carried out, as reported by Seibel (2008) on RoSCAs in Nigeria.[325] In Burkina Faso, RoSCAs usually deduct a share from the "common fund towards a loan fund or a contingency fund from which important risk sharing activities may be financed", such as credit provision for health care costs of member households.[326]

Access to other, formal financial products is more limited and often only accessible to households working in the formal sector. This is particularly the case in the countries of Sub-Saharan Africa, as it has one of the smallest financial sectors in the world. Although there are several imperfections in financial markets in low-income countries, some market-based SRM strategies from commercial or non-profit institutions can be accessible for rural and low-income households. Microfinance institutions (MFIs) are among those institutions targeting people working in the informal sector or in rural areas. They have provided small scale financial services for the target population and catered to a substantial market in Sub-Saharan Africa in recent years. The core services of MFIs are credit and savings products, but increasingly MFIs additionally provide microinsurance services.[327] Typically, to keep transaction costs low and repayment rates high, MFIs disperse loans to groups of loan takers and apply group liability and the loans are meant to be investment loans in small enterprises or micro-enterprises run by the loan takers. In the meanwhile, many MFIs also provide individual loans and consumption loans.[328] According to Bhattamishra et al. (2010) the liability of the group to repay the loans is an incentive for group members to provide assistance to other group members against shocks beyond the contractually defined MFI-related interactions.[329] On the other hand, criticism of microfinance was raised when reports became

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[323] Sommerfeld et al. (2002): Informal risk-sharing arrangements (IRSAs) in rural Burkina Faso, p. 157.

[324] Bhattamishra et al. (2010): Community-Based Risk Management Arrangements, p. 926.

[325] Seibel (2008): Changing Patterns of Risk Management by Self-Help Organizations of Savings and Credit. The Nigerian Experience, p. 46.

[326] Sommerfeld et al. (2002): Informal risk-sharing arrangements (IRSAs) in rural Burkina Faso, p. 157.

[327] Robinson, Marguerite S (2001): The microfinance revolution, 1 edition. Washington, D.C., p. 9.

[328] Armendariz de Aghion, Beatriz; Morduch, Jonathan (2007): The Economics of Microfinance. MIT Press. Cambridge, p. 12ff.

[329] Bhattamishra et al. (2010): Community-Based Risk Management Arrangements, p. 926.

public on excessive group pressure to repay loans in MFIs having resulted in suicides of (overly) indebted borrowers.[330] Many microcredit products include mandatory savings or credit-life insurance, through which the loan is waived if the loan taker dies and sometimes an additional financial compensation is paid for the spouse and the family. The growth rates have been high for microfinance products in Sub-Saharan Africa during the past years, although the market penetration for low-income households was only at about 15% in 2008.[331] Still, microfinance institutions are, for most low-income households and those working in the informal sector, the only possibility to access formal savings and credit services, as the commercial banking sector has quite a low outreach. For example, in Ghana and Malawi, the percentage of depositors at commercial banks in Ghana is at 27.1% and in Malawi at 16.0% of adults. The access to loans at commercial banks is more restricted, so that only 3.4% of adults are borrowers at commercial banks in Ghana and only 1.6% in Malawi.[332]

The type and extent of impact of microcredit and microsavings services on individuals and households is still debated. In a systematic literature review, Stewart et al. (2010) identified only 15 impact assessment studies of medium or high quality in Sub-Saharan African countries.[333] Their review extracted few positive impacts consistent with most of the studies. First, they identified a generally positive impact on wealth, in the form of increased savings or accumulation of assets.[334] Second, they found a generally positive impact on health, for example in the form of increased investment in health (e.g. health insurance), higher expenditure on health care and a positive effect on the health of children.[335] Regarding other types of impacts, the results of the analyzed studies were mixed. On microcredit and microsavings as SRM strategies, the authors drew the cautious conclusion that "microfinance enables poor people to be better placed to deal with shocks, but this is not universal (some clients take their children

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[330] The microfinance crisis was discussed particularly in India. Several (commercial) MFIs urged borrowers into high risk and high debt. Loan officers and loan groups exerted high pressure to repay loans. Ahmed, Fakhruddin; Brown, Brad; Williams, Susan Perry (2013): Is It Time to Regulate Microfinance? In: Progress in Development Studies, vol. 13, nr. 3, p. 210 and 212.

[331] Women's World Banking (2008): Diagnostic to Action. Microfinance in Africa, p. 2f. URL: http://collab2.cgap.org//gm/document-1.9.34983/Diagnostic%20to%20Action_%20Microfinance%20in%20Africa.pdf (accessed 2010/02/09).

[332] The World Bank (2014): Data Ghana; The World Bank (2014): Data Malawi.

[333] Stewart et al. identified 35 studies in total, but dropped 20 studies from the analysis due to poor reporting or methodology. Stewart, Ruth; van Rooyen, Carina; Dickson, Kelly; et al. (2010): What Is the Impact of Microfinance on Poor People? A Systematic Review of Evidence from Sub-Saharan Africa, edited by EPPI Centre, Social Science Research Uni, Insititute of Education University of London, et al. London, p. 5 and 25.

[334] Ibid., p. 31ff.

[335] Ibid., pp. 31ff., 34f., 44 and 49.

out of school)"[336]. In a panel study by Romero et al. (2011) on the impact of microsavings on coping strategies in Malawi, the authors concluded that they had not found a significant effect on shock coping behavior.[337] With the increased use of microsavings (in this case from Opportunity International Bank Malawi (OIBM)), the use of coping strategies with high negative (long-term) impact on the household also increased. Compared to the situation before the introduction of the microsavings product by OIBM, both the households' strategy to take no action against adverse shocks and the use of cash savings decreased, while a reduction in household consumption, increased labor supply and the depletion of assets increased. Hence, according to the study by Romero et al., microsavings at OIBM did not lead to an improvement in risk management capacities.[338]

In the social risk management category of risk-sharing, Bhattamishra et al. (2010) reported several arrangements, particularly mutual gift-giving, informal credit arrangements and traditional property rights.[339] According to Bhattamishra et al., mutual gift-giving, inter-household transfers or remittances are very common mechanisms for risk sharing; their use evidently increases if the household income significantly drops, as shown by a study from rural Botswana.[340] Generally, informal credit arrangements show a high diversity. Informal state-contingent loans, as reported from Nigeria, are an example of the repayment duration and interest rate of existing loans varying by the economic status (i.e. if hit by a shock) of both the borrower and the lender; therefore, they can serve, to some extent, as an SRM instrument, as they smooth expenses on interest and repayments, depending on the economic well-being of the involved parties.[341] In urban Malawi, Devereux (1999) reported that informal borrowing from friends, employers and moneylenders was very common, and that the practice showed a significant diversity. Monetary or non-monetary loans between friends and from an employer were often given as part of reciprocity arrangements at no or low interest rates and could serve as an informal safety network. However, these support networks

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[336] By 'microfinance' Stewart et al. refer to microsavings and microcredit. Ibid., p. 49.

[337] The panel study was conducted for Opportunity International Bank (OIBM) Malawi. The most commonly reported adverse economic shocks were loss of livestock, increased prices of food and input and a drop in crop prices. Romero, José M.; Nagarajan, Geetha (2011): Impact of Microsavings on Shock Coping Strategies in Rural Malawi. IRIS Center, University of Maryland. no place, p. 35ff. URL: http://www.microfinancegateway.org/p/site/m/template.rc/1.9.56186?cid=PSD_MFGatewayBulletinEN_W_EXT.

[338] Ibid., p. 34ff.

[339] Not all reported risk management arrangements have evidence in Sub-Saharan Africa. These are skipped in this study.

[340] Bhattamishra et al. (2010): Community-Based Risk Management Arrangements, p. 924.

[341] Ibid., p. 925.

reached their limit when covariate shocks hit many or all of the households.[342] In comparison, loans from moneylenders are less preferred and often used only if other borrowing sources are exhausted, mostly, because interest rates of informal moneylenders in Malawi can reach a nominal rate of 100%, independent of loan duration.[343] Using empirical data from 1999, Devereux showed that about 40% of households made use of informal transfers from relatives or friends, but also reported that about 20% of urban households (about 30% of rural households) experienced refusal of help by relatives or friends.[344]

A particular form of gift-giving is a national or international remittance from family members, relatives, friends or past employers, which may be an important income resource for households. Generally, the extent of remittances is often under-estimated as they are difficult to measure. In 2006, international remittances to Sub-Saharan African countries were estimated at US$ 9 billion and were, therefore, about 45-65% of formal transfers.[345] Remittances can take the form of regular or irregular cash allowances, the first being usually independent of any event and the latter more frequently dependent on certain life-cycle events or shocks experienced by the receiving household. According to Gupta et al. (2009) the majority of remittances aimed to increase or smooth consumption or were for investment in human capital, e.g. education, nutrition and health care and they concluded that "remittances have a direct poverty-mitigating effect, and a positive impact on financial development".[346] In a study on remittances as a risk-sharing strategy in Ghana, Mazzucato (2008) showed that a share of remittances was sent to manage shocks. For example, remittances for health care and funerals were of vital importance for receiving households; remittances for these purposes comprised about 7% of all remittances. However, according to Mazzucato, the vast majority were sent for the purpose of business (33%), housing (16%), general help (41%), subsistence (20%) and education (11%).[347] In Malawi, using 1998 data, Davies et al. (2009) reported that over 20% of households received remittances, with an average of 43% of total income (non-business income). This study found that the single most reason for the use of re-

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[342]   Devereux (1999): Making less last longer, p. 35f.

[343]   Ibid., p. 36f.

[344]   Ibid., p. 51.

[345]   cp. Ibid., p. 37f.; Gupta, Sanjeev; Pattillo, Catherine A.; Wagh, Smita (2009): Effect of Remittances on Poverty and Financial Development in Sub-Saharan Africa. In: World Development, vol. 37, nr. 1, p. 105.

[346]   Gupta et al. (2009): Effect of Remittances on Poverty and Financial Development in Sub-Saharan Africa, p. 112 and 105.

[347]   The study uses data from 2003/04 from Ghana-Netherlands migrants. Mazzucato, Valentina (2009): Informal Insurance Arrangements in Ghanaian Migrants' Transnational Networks. The Role of Reverse Remittances and Geographic Proximity. In: World Development, p. 4f.

mittances is education, among other not further specifiable increases in consumption.[348] Similarly, according to a study by the African Development Bank in 2007, the most frequent uses for remittances were family expenses, health care and education.[349] Regarding national remittances, Devereux (1999) reported that urban to rural remittances were most common, but there were exchanges in both directions, mostly primary goods (e.g. grain, maize, vegetables and meat) from rural to urban areas and any kind of manufactured goods from urban to rural areas.[350]

Traditional rights systems to common property showed a significant risk management element in pastoralist, farming and fishing communities. Land use rights, water resources and fishing grounds were negotiated and allocated within a community and also between communities, also on the basis of shocks experienced by households or communities.[351] There is evidence that output from common property production partially is redistributed to poor households and those affected by shocks.[352] For example, several types of rotating labor arrangements were found in rural Burkina Faso for the purpose of assisting each other in agricultural tasks, as well as for house renovation or construction. These mechanisms also served risk management purposes, e.g. for sick or elderly members of the community. Sometimes, in Burkina Faso, the village head or traditional authority organized collective work for the assistance of a household hit by a shock (e.g. for agricultural work) or for the construction of public goods, such as construction or renovation of roads, health centers, schools, or cattle immunization campaigns etc.[353]

Funeral or burial societies are more similar to risk-pooling arrangements, following the terminology of the adapted SRM framework. Contrary to other risk-sharing arrangements, both the membership and rules of a funeral society are usually well-defined; the societies either have a common fund or an expected monetary or in-kind contribution in case of a death in the society members' households.[354] Cohen et al. (2005) reported several of such risk-sharing arrangements in their study in Tanzania, Uganda and Kenya, in the form of burial societies protecting against high funeral costs and hence providing some protection for the surviving dependents. Cohen et al. also

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[348] Davies, Simon; Easaw, Joshy; Ghoshray, Atanu (2009): Mental Accounting and Remittances. A Study of Rural Malawian Households. In: Journal of Economic Psychology, vol. 30, nr. 3, p. 327f.

[349] African Development Bank (2009): Migrant Remittances. A Development Challenge, p. 42f. URL: http://collab2.cgap.org//gm/document-1.9.34957/Migrant%20Remittances,%20a%20Development %20Challenge.pdf (accessed 2010/02/05).

[350] Devereux (1999): Making less last longer, p. 38, 42 and 50.

[351] Bhattamishra et al. (2010): Community-Based Risk Management Arrangements, p. 925.

[352] Ibid., p. 927.

[353] Sommerfeld et al. (2002): Informal risk-sharing arrangements (IRSAs) in rural Burkina Faso, p. 154.

[354] Bhattamishra et al. (2010): Community-Based Risk Management Arrangements, p. 925.

mentioned the so-called Friends in Need Groups, which are less specific to a particular risk, but provide support in case of extraordinary shocks. Both types of groups require payment of dues and provide assistance from the group resources if a more or less defined shocks hits.[355] According to Bhattamishra et al. (2010), community-based health financing, particularly micro health insurance, is often an externally induced arrangement providing risk-pooling for health risks. Micro health insurance, as a social risk management instrument for health risks and high health care costs based on risk-pooling mechanisms, is discussed more in detail in section 4.3.5.

Assessing the effectiveness of informal risk-sharing arrangements (not including risk-pooling mechanisms such as microinsurance), the World Bank (2001) considered the insurance effect quite low, although a high frequency of interactions can be identified.[356] Another weakness of many community level SRM strategies was reported by Cohen et al. (2005), who identified a wealth effect in access to informal groups. Access to these risk-sharing groups was found to be regressive, since poorer households "often fall out of informal group-based systems if they cannot keep up with the reciprocal obligations".[357] Along these lines, Dercon showed, in a study in Ethiopia, that there were indications that risk sharing within the community was less present for households with only small landholdings.[358] On the other hand, access to formal insurance mechanisms is substantially more restricted, for example, Cohen et al. noted that formal insurance was generally perceived to be only for the rich.[359] On the availability of formal health insurance for rural and low-income households in SSA, see section 4.3.3.

4.3.3. Social health risk management strategies and the sequence of their application in Sub-Saharan Africa

As pointed out in section 2.3, health risks have particular risk characteristics. First, all individuals are exposed to health risks without exception and health risks are often not predictable. Second, health risks pose a three-fold challenge to households' response strategies: one challenge stems from the loss of health itself and another from the double economic burden of disease resulting from health care expenditures and the third is indirect costs, including loss of income. Although many SRM strategies are appropriate as a response to different types of risk (such as saving or borrowing), some SRM strate-

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[355] Cohen et al. (2005): Reducing vulnerability, p. 398f.
[356] The World Bank (2001): Dynamic Risk Management and the Poor. Developing a Social Protection Strategy for Africa I, p. 16.
[357] Cohen et al. (2005): Reducing vulnerability, p. 400.
[358] Dercon, Stefan; Krishnan, Pramila (2000): In Sickness and in Health. Risk Sharing within Households in Rural Ethiopia. In: Journal of Political Economy, vol. 108, nr. 4, p. 715 and 722.
[359] Cohen et al. (2005): Reducing vulnerability, p. 400.

gies are particularly or exclusively applied in response to health risks. In this section, the typical SRM strategies to counter health risks are further analyzed, going from the household level to the national level. Another focus of this section is the sequence of the application of household's SRM strategies against health risks.

In a study in the East African countries of Tanzania, Uganda and Kenya, Cohen et al. (2005) identified several typical pro-active household response strategies for risks like illness, death or property loss. The reported strategies were primarily self-insurance strategies, such as depleting savings or selling consumer durable goods, and were followed by informal group mechanisms, such as risk-sharing arrangements.[360] Cohen et al. (2005) also reported several reactive strategies, such as borrowing from formal and informal sources, the use of savings and the depletion of assets. An example of a community-based form of reactive strategies is a local habit in Kenya, so-called harambees, where fund-raising is practiced for households that are hit by a shock; even raising large sums, e.g. for hospitalization costs.[361]

In a mixed-methods study on risk coping strategies in Burkina Faso conducted in 1992, Sauerborn et al. (1996) analyzed typical SRM strategies, in case of illness, and took into consideration the sequence of the application of strategies. According to Sauerborn et al., the households typically first applied the strategy of using available cash and savings (including migrant remittances) and gifts from extended family to pay for health care costs.[362] The second most common SRM strategy in Burkina Faso, which sequentially came after the use of savings, was selling assets and taking loans.[363] Sale of assets was reported to be practiced particularly in the form of livestock sales.[364] Loans were frequently taken from extended family, neighbors or friends at low or no interest (i.e. in the case of loans to kin). In the sequence of strategies, an increase in labor supply, taking up additional income generation activities (such as collecting firewood, building fences, weaving or tailoring) and taking up wage labor were the third type of strategy pursued by households. Comparatively poor households were an exception, as they used this type of strategies as the second coping strategy after the use of savings, which was likely related to their generally low availability of assets and lack of access to loans.[365] Sauerborn et al. (1996) reported that (unlike the evidence for Malawi, see section 4.3.1) households in Burkina Faso tried to avoid piecework labor for wages for the reason of avoiding the trade-off between working in their own field

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[360] Ibid., p. 398f.
[361] Ibid.
[362] Sauerborn et al. (1996): Household Strategies to Cope with the Economic Costs of Illness, p. 293f.
[363] Ibid., p. 296.
[364] Ibid., p. 294.
[365] Ibid., p. 296.

or for wages. Going for free health care services, ignoring the illness or forgoing treatment were other reported SRM strategies.[366] In Burkina Faso, lost work time due to illness of a household member was primarily mitigated through the substitution of work by other household members. The secondary strategy to compensate for lost work time reported was taking work assistance from other households, hiring labor or restructuring the production so that less work was needed (e.g. change of crops or use of more pesticides and fertilizer).[367]

Waelkens (2005) described the sequence of SRM strategies in response to health risks at the household and community levels in Africa. According to her, a typical first step of ill persons was accessing "local and cheap solutions" such as home remedies and modern or traditional drugs, which were locally available. In the second step, the most convenient and accessible provider (traditional or western health care) was sought. In case the second step failed, or was inaccessible in terms of financial or opportunity costs, health care seeking was postponed.[368] Waelkens described self-insurance as a main proactive SRM strategy, on the individual or household level, which comprised savings, calling in debts, or sale of assets. Community-based proactive mechanisms predominantly belong to the group of informal risk sharing arrangements. In Waelkens' study, these proactive mechanisms ranged from funeral societies, to 'friends in needs groups', and SACCOs or ROSCAs to "other member-based associations that give, in return for due contributions, a right to accessing the group resources for a determined purpose"[369].

In a study of informal sector workers in Tanzania, concerning their strategies to manage health care costs, Munga et al. (2009) concluded that informal savings networks (i.e. ROSCAs) "are significant in not only helping households to cope with financial shocks caused by malaria but also in overall attempts by the poor [...] to disentangle themselves from the medical poverty trap".[370] On the other hand, Munga et al. noted that reactive strategies "such as borrowing from friends and neighbors have a greater tendency to drag households further into medical poverty".[371] However, it was reported that proactive community-level mechanisms were decreasingly adapted due to a rapidly changing world and dissolving traditional living situations, which reduced the

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[366] Ibid., p. 294 and 299.
[367] Ibid., p. 295 and 297.
[368] Waelkens et al. (2005): The Role of Social Health Protection in Reducing Poverty, p. 16.
[369] Ibid.
[370] Munga, Michael A.; Gideon, Gilbert M. (2009): Assessment of the Experiences and Coping Strategies of People Working in the Informal Sector in Their Quest to Access Health Care Services. The Case of Dar es Salaam, Tanzania. In: Bioscience Trends, vol. 3, nr. 1, p. 13f.
[371] Ibid., p. 15.

effectiveness of informal risk-sharing arrangements, that were based on traditional values such as kin, extended family or reciprocal structures.[372]

Reactive strategies, as reported by Waelkens et al., ranged from a pure reallocation of household resources, or borrowing small amounts, to consumption reduction to strategies with a longer-term negative effect. Among the strategies negatively affecting the household long-term were selling productive assets, taking children out of school, defaulting on loans or taking loans from moneylenders with high interest, and also drastically reducing food consumption.[373]

Access to market-based SRM strategies to counter health risks is generally quite limited for households who work in the informal sector in Sub-Saharan Africa. *Risk-pooling mechanisms* for low-income households, such as private health insurance, almost exclusively target middle- or high-income households. In a study on microinsurance in Africa, Matul et al. (2010) counted only 0.7 million low-income African households insured for health with a regulated insurance company (i.e. private health insurance) or other risk carrier. Private insurers in Africa covered less than half the number of households compared to those covered by mutual or community-based health insurance schemes. In total, Matul et al. counted about 1.9 million individuals in Africa, covered for part of their health risks. Additionally, the regulated insurance companies who were active in the low-income market tended to focus on the higher end of that market.[374] Section 4.3.5 provides a more thorough analysis of the number of rural or low-income individuals covered by health insurance in Sub-Saharan Africa.

In their analysis on private health insurance in low- and middle income countries, Drechsler et al. (2007) argued that private for-profit health insurance in Sub-Saharan Africa would likely remain a niche product mostly for high-income individuals in the foreseeable future and concluded that "private pro-profit insurance will not become a significant pillar of the health care system of African countries".[375] Due to the poor outlook for private health insurance, Drechsler et al. advised a scaling-up of small-scale non-profit schemes,[376] such as micro health insurance schemes, further described in section 4.3.5. According to Drechsler et al., an exception for the low permeation of private health insurance on the African continent is South Africa, which has an estab-

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[372] Waelkens et al. (2005): The Role of Social Health Protection in Reducing Poverty, p. 16f.

[373] Ibid., p. 17.

[374] Matul, Michal; McCord, Michael J.; Phily, Caroline; et al. (2012): The Landscape of Micro Health Insurance in Sub-Saharan Africa. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa, 1. Lit Verlag. Berlin, p. 68, 74 and 79f.

[375] Drechsler, Denis; Jütting, Johannes P. (2007): Chapter 7: Scope, Limitations, and Policy Responses. In: Preker, Alexander S.; Scheffler, Richard M.; Bassett, Mark C. (eds.): Private Voluntary Health Insurance in Development. Friend Or Foe. The World Bank. Washington, D.C., p. 196.

[376] Ibid., p. 181.

lished private health insurance market.[377] Similarly, in Botswana, private health insurance schemes have a significant outreach.[378] Drechsler et al. also mentioned Namibia and Zimbabwe, whose private health insurance schemes accounted for 22.4% and 18.8% of total expenditure on health, respectively. This figure showed the concentration of private health insurance among wealthy groups of society, because only 8% of the population were covered by private health insurance, whose premiums still accounted for one fifth of the total expenditure on health in Zimbabwe.[379]

Health risk management strategies on the national level in Sub-Saharan Africa differ widely between countries. In terms of health care financing systems, countries apply a combination of different strategies comprising tax- or donor-financed health financing strategies or (mandatory) social health insurance (SHI) (in figure 2 SHI is subsumed under general government expenditure on health), private pre-paid health plans or private health insurance, and out-of-pocket payments, as well as other private expenditures on health. A closer look at these sources of health care financing in international comparison showed a large diversity in the systems, which is presented in figure 2, on the distribution of financing sources.[380] The sources shown in this figure add up to the total expenditure on health (THE) in the respective country. The data showed that many countries in West and Central Africa, including Ghana, showed comparatively high shares of out-of-pocket payments, with all their detrimental effects on livelihoods and systematic inefficiencies, as discussed above in section 2.4.1. On the other hand, in South African countries, shares of out-of-pocket payments were comparatively low and usually corresponded with relatively high levels of general government spending on health.[381] In about half of the countries in SSA (21 countries / 52.5%), governmental spending on health constituted more than half of the sources for health care. In a few countries, governmental spending exceeded 70% of THE, the case in Botswana, Malawi, Angola, Equatorial Guinea, Cap Verde and Gabon. On the other side of continuum are 13 countries (32.5%) that had a share of out-of-pocket payments (OOPS) above

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[377] Drechsler, Denis; Jütting, Johannes P. (2005): Private Health Insurance in Low- and Middle-Income Countries. Scope, Limitations, and Policy Responses. OECD Development Centre. Issy-les-Moulineaux, p. 195.

[378] Swami, Bonu N.; Okurut, Francis N.; Yinusa, Dauda O.; et al. (2012): Problems and Prospects of Micro Health Insurance. Case Study of Itekanele Medic Aid Scheme in Botswana. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa, 1. Lit Verlag. Berlin [a.o.], p. 96.

[379] Drechsler et al. (2007): Chapter 7: Scope, Limitations, and Policy Responses, p. 195.

[380] The figure was taken from a previously published article by the author. Leppert (2012): Financing Health Care. The Role of Micro Health Insurance in Sub-Saharan Africa, p. 179.

[381] An exception is South Africa where private prepaid plans have a large share of total expenditure on health in comparison to other African countries, followed by Namibia.

Fig. 2: Sources of health care financing
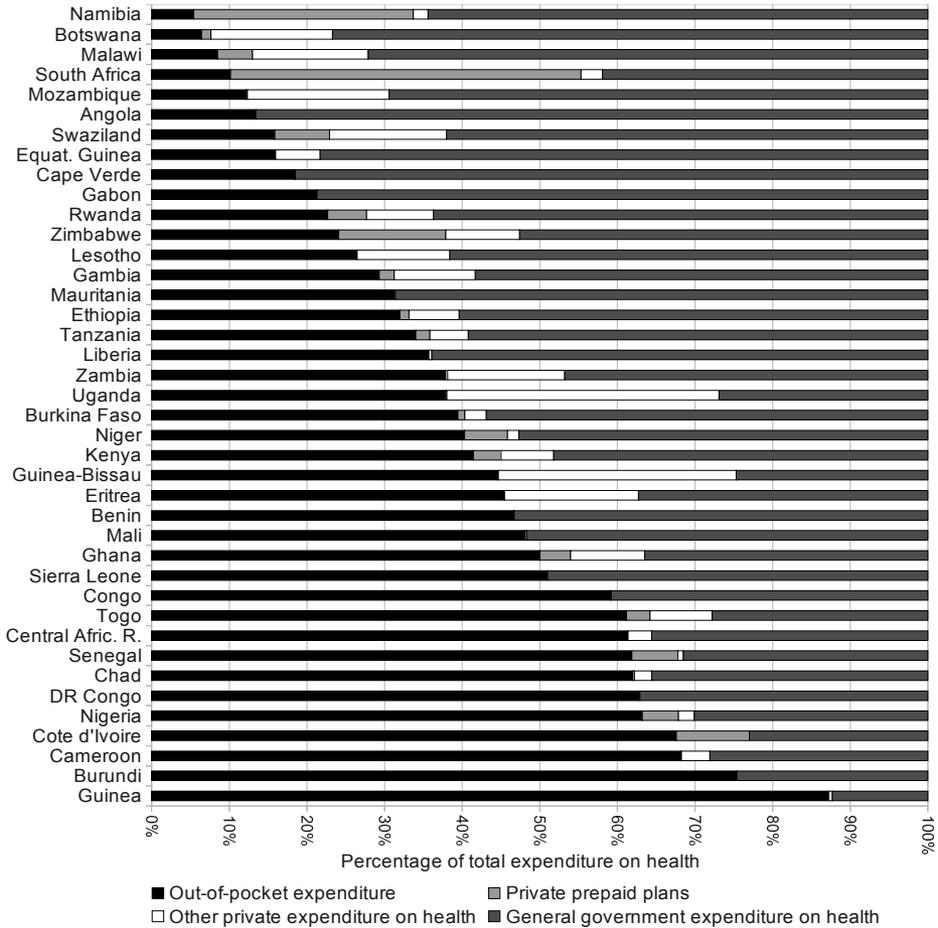
Source: author, Data from WHO, Statistical Information System 2008.

50%, including Ghana. The share of OOPS even exceeded 70% in two countries, Burundi and Guinea. However, it needed to be noted that the distribution of sources of total health expenditure neither gives information about the absolute value of THE nor the quality of care provided, which is often a concern in systems with predominant provision of health care by public health care providers. As discussed above, OOPS and spot market transactions between users and health care providers are regressive and have negative side effects, such as catastrophic health care costs and the exclusion of the poor from health care utilization. In order to avoid OOPS, two main mechanisms

were established during the 19th and 20th century, country-wide health insurance/SHI and subsidy-based financing, both common health care financing mechanisms in industrialized countries.[382] As intensively discussed in other parts of this study, health insurance is a strategy recommended by many researchers and development practitioners. Subsidy-based financing, which is often more recently in development context termed *user fee abolition*, also brought improvements to access to health care and increased utilization.[383]

The large diversity in health care financing and health risk management strategies in Sub-Saharan Africa, as shown in figure 2, have historic roots; they are a result of colonial structures, post-colonial constraints, patterns of path-dependency and spatial innovation diffusion processes. The subsequent section 4.3.4 analyzes national health risk management strategies and the emergence of micro health insurance from a historic viewpoint.

4.3.4. History and trends in health care financing systems in Sub-Saharan Africa[384]

In colonial times, mainly mission-owned hospitals, whose numbers often exceeded the number of government-owned hospitals, offered (mostly) free health care to the local population. These missionary hospitals offered their services together with their missionary beliefs, leading to dependency and a widespread antipathy amongst the local population. Furthermore, early missions were often "directly instrumental to colonialist intervention".[385] In comparison, public health care institutions for the local population were mainly established after the First World War, when colonial governments started to overtake responsibility for African health care. In general, health policy was closely linked to the colonies' economic function within colonial rule and a proper health status of the population served as a means to economic and missionary goals, rather than as an intrinsic aim by itself. Therefore, (rudimentary) established public health care services aimed predominantly at strengthening imperial rule, by maintain-

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[382] Preker, Alexander S.; Langenbrunner, Jack; Jakab, Melitta (2002): Rich-Poor Differences in Health Care Financing. In: Dror, David M.; Preker, Alexander S. (eds.): Social Re Insurance. A New Approach to Sustainable Community Health Financing. The World Bank. Washington, D.C., p. 22.

[383] Ridde, Valéry; Morestin, Florence (2011): A Scoping Review of the Literature on the Abolition of User Fees in Health Care Services in Africa. In: Health Policy and Planning, vol. 26, nr. 1, p. 9f.

[384] This section is partially based on a previously published article by the author, but contains many changes: Leppert, Gerald; Degens, Philipp; Ouedraogo, Lisa-Marie (2012): Emergence of Micro Health Insurance in Sub-Saharan Africa. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa. LIT Verlag. Berlin.

[385] Good, Charles M. (1991): Pioneer Medical Missions in Colonial Africa. In: Social Science and Medicine, vol. 32, nr. 1, p. 2.

ing the health of the local workforce in the agricultural, mining and military sectors. In addition, colonialists regarded providing health care as one element of the racist western "civilizing mission".[386]

After regaining their independence in the 1950s and 1960s, many African countries aimed to provide free or heavily subsidized health care, following the slogan "health for all", similar to the British tax-based Beveridge-model.[387] Yet, most countries did not focus on contribution-based systems, such as (compulsory) social health insurance in the form of the Bismarck model.[388] The 1979 Alma-Ata Declaration further emphasized the aim of universal health care provision.[389] However, public health care facilities rarely stretched beyond urban areas and mining enclaves; rural areas were often only served by missionary providers who had been subsequently starting to charge user fees, due to the increasing concerns of cost recovery.[390] Furthermore, over the years, budgetary constraints, mainly resulting from narrow tax income, contributed to low quality of health care provision, long waiting periods and non-availability of essential drugs.[391]

In addition, as a result of the structural adjustment policies by the World Bank and the IMF in the 1980s, public spending was further reduced in order to achieve economic recovery in developing countries.[392] Hence, African governments were forced to decrease their spending on health and education in favor of serving common debts.[393] As a result, many African governments failed to provide better access to quality health

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[386] see Ibid., p. 1f.; Worboys, Michael (2000): The Colonial World as Mission and Mandate. Leprosy and Empire, 1900-1940. In: Osiris, vol. 15, pp. 211–213.

[387] Criel, Bart (1998): District-Based Health Insurance in Sub-Saharan Africa, Vol. I, vol. 9. Studies in Health Services Organisation & Policy, Part I: From Theory to Practise. ITG Press. Antwerp, p. 1.

[388] see Ron, Aviva; Abel-Smith, Brian; Tamburi, Giovanni (1990): Health Insurance in Developing Countries. The Social Security Approach. International Labour Office. Geneva, p. 16.

[389] Dror, David M.; Preker, Alexander S.; Jakab, Melitta (2002): The Role of Communities in Combating Social Exclusion. In: Dror, David M.; Preker, Alexander S. (eds.): Social Re Insurance. A New Approach to Sustainable Community Health Financing. World Bank Publications. Washington, D.C., p. 42f.

[390] Atim, Chris (1998): The Contribution of Mutual Health Organizations to Financing, Delivery, and Access to Health Care. Synthesis of Research in Nine West and Central African Countries. Technical Report. Partnerships for Health Reform Project, Abt Associates Inc., USAID. Bethesda, p. 1. URL: http://pdf.usaid.gov/pdf_docs/PNACH273.pdf (accessed 2010/04/01).

[391] Criel (1998): District-Based Health Insurance in Sub-Saharan Africa, Vol. I, p. 1.

[392] Arhinful, Daniel Kojo (2003): The Solidarity of Self-Interest. Social and Cultural Feasibility of Rural Health Insurance in Ghana, vol. 2003. African Studies Centre - Research Report. PrintPartners Ipskamp B.V., Enschede. Leiden, p. 46f.

[393] Naiman, Robert; Watkins, Neil (1999): A Survey of the Impacts of IMF Structural Adjustment in Africa. Growth, Social Spending and Debt Relief. URL: http://dspace.cigilibrary.org/jspui/handle/123456789/7914 (accessed 2012/09/30).

care, undermining achievements they had made.[394] In 1987, the Bamako initiative – coordinated by African ministers of health and initiated by the WHO and UNICEF – aimed at (and partially achieved) improving access to essential drugs and improving quality of health care facilities.[395] In order to stabilize the income of health care providers, the commonly called "fee for service" or "cash and carry" system was introduced, making the patients pay out-of-pocket for most of the treatment. By 1993, almost all countries in Sub-Saharan Africa had introduced some form of user fees.[396] Hence, the reduced public commitment to social health risk management on the national level resulted in an increased burden of health risks on the household- and community-levels. Redundancy of SRM on multiple levels, as mentioned in section 3.2, was undermined, leaving households without support and backup mechanisms in SRM on higher levels; a gap which could be only partially filled by charitable providers offering services at or below cost recovery thresholds and by other local or employer initiatives.

Over the last twenty years, several studies confirmed negative effects of out-of-pocket payments. Extensive out-of-pocket-payments pose a large financial burden to the population, lead to an overall reduced utilization of health care services and ultimately to an exclusion of the poor segments of society.[397] For example, Asfaw et al. examined the effects of user fees in rural areas of Ethiopia and concluded that they "have a very strong negative impact on the utilization of health care services", especially among the poor.[398]

However, the Bamako initiative not only endorsed the introduction of user fees, but also emphasized the self-responsibility of communities, decentralization, community control and the introduction of community-based micro health insurance schemes.[399] Hence, MHI schemes were promoted to fill the gap of health care financing left by gov-

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[394] Olukoshi, Adebayo O. (1996): Extending the Frontiers of Structural Adjustment Research in Africa: Some notes on the Objectives of Phase II of the NAI Research Programme. In: Gibbon, Peter; Olukoshi, Adebayo O. (eds.): Structural Adjustment and Socio-Economic Change in Sub-Saharan Africa: Some Conceptual, Methodological and Research Issues, vol. 102. Nordiska Afrikainstitutet research report. Motala, p. 62.

[395] Criel (1998): District-Based Health Insurance in Sub-Saharan Africa, Vol. I, p. 40f.

[396] Atim (1998): The Contribution of Mutual Health Organizations to Financing, Delivery, and Access to Health Care, p. 2.

[397] Leive et al. (2008): Coping with out-of-pocket health payments; Lagarde, Mylene; Palmer, Natasha (2008): The Impact of User Fees on Health Service Utilization in Low- and Middle-Income Countries. How Strong Is the Evidence? In: Bulletin of the World Health Organization, vol. 86, nr. 11; Asfaw, Abay; von Braun, Joachim; Klasen, Stephan (2004): How Big is the Crowding-Out Effect of User Fees in the Rural Areas of Ethiopia? Implications for Equity and Resources Mobilization. In: World Development, vol. 32, nr. 12.

[398] Asfaw et al. (2004): How Big is the Crowding-Out Effect of User Fees in the Rural Areas of Ethiopia?, p. 2077.

ernments' decisions to rely on user fees as financing mechanism. Numerous MHI schemes have been initiated in Sub-Saharan African countries over the past 25 years (see subsequent section 4.3.5), that operated either independently from any government effort or with (limited) government support. In those countries of SSA, where social health insurance schemes were established, they almost exclusively targeted individuals and households working in the formal sector; hence, access to these financing schemes often does not exceed 5% of society.[400] The largest share of society works in the informal sector and tends to be excluded from these traditional social insurance mechanisms.[401]

As already mentioned in section 3.1 on the development of the SRM framework, social protection in health has been seen as an increasingly important building block in order to achieve economic growth and poverty reduction.[402] After 2000, and at the latest since the World Health Report 2010, the international focus has increasingly adopted the goal to achieve universal health care coverage by ensuring that health care services are accessible to all people without financial barriers. Hence, the report claims that countries "must raise sufficient funds, reduce the reliance on direct payments to finance services, and improve efficiency and equity."[403]

This refocus in international health policies has led to increased efforts in many low- and middle income countries to implement more equitable health interventions (e.g. in Malaria control, maternity and child care)[404] and to extend risk pools by either improving tax-based health financing systems or by implementing social health insurance schemes for the formal sector and/or the informal sector. However, evidence

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[399] see McPake, Barbara; Hanson, Kara; Mills, Anne (1993): Community Financing of Health Care in Africa. An Evaluation of the Bamako Initiative. In: Social Science and Medicine, vol. 36, nr. 11, p. 1383.

[400] Xaba, Jantjie; Horn, Pat; Motala, Shirin (2002): The Informal Sector in Sub-Saharan Africa. Employment Sector 2002/10. International Labour Office. Geneva. URL: www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_122204.pdf (accessed 2014/09/30).

[401] On average the informal economy accounts for about 80 per cent of non-agricultural employment in African countries, International Labour Office (2002): Decent Work and the Informal Economy, p. 1.

[402] cp. Arhin-Tenkorang, Dyna (2001): Health Insurance for the Informal Sector in Africa. Design Features, Risk Protection, and Resource Mobilization. HNP Discussion Papers. The World Bank. Washington, D.C.

[403] WHO (2010): The World Health Report 2010. Health Systems Financing. The Path to Universal Coverage. World Health Organization. Geneva, p. xi. URL: http://www.who.int/whr/2010/en/index.html (accessed 2012/02/14).

[404] De Allegri, Manuela; Louis, Valérie R; Tiendrébeogo, Justin; et al. (2012): Moving Towards Universal Coverage with Malaria Control Interventions. Achievements and Challenges in Rural Burkina Faso. In: The International Journal of Health Planning and Management; Yates, Rob (2010): Women and Children First. An Appropriate First Step towards Universal Coverage. In: Bulletin of the World Health Organization, vol. 88, nr. 6.

showed that these efforts differ significantly with regard to the target population (i.e. outreach of programs to low-income households and informal sector workers), covered services and the extent of cost coverage. Also, the organizational structure differs between countries. Programs are either extensions of formal sector programs, systems built on MHI schemes and experience or green-field programs with national roll-out structures. Also, the programs differ in the source of financing, as newer schemes are based on general government revenues, with or without payroll contributions by formal sector employees, household insurance premiums, or on an ear-marked share of the VAT.[405]

4.3.5.   Micro health insurance in Sub-Saharan Africa[406]

As discussed above, poor or low-income households are most vulnerable to health risks but less protected against the consequences. Informal community-level SRM strategies, such as risk-sharing arrangements, have their limitations and essential public- or marked-based SRM strategies fail or are inaccessible for the target population. This is the case, for example, for social health insurance schemes in most countries of SSA.

On the other hand, micro health insurance explicitly targets rural and urban low-income households working in the informal economy and helps them access an SRM strategy applying risk pooling mechanisms, in order to reduce the risk of catastrophic health care costs. Thus, micro health insurance is defined as a risk management institution for the low-income population (mostly working in the informal sector) that covers the costs of certain predefined illness-related losses (= limited benefit package) to a certain extent (= limited coverage). The key feature of micro health insurance is that the premium is prepaid on a regular basis before the illness-related event occurs. The premium is calculated to be affordable to the low-income population. Like any insurance, micro health insurance units apply risk pooling between good and bad risks, based on the fact that health risks are inter-temporally and inter-personally distributed. Due to being embedded in local communities, the benefits of risk pooling can reach rural and remote areas and low-income households with comparably low transaction costs. Furthermore, the schemes act in several other functions, such as the implementation of

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[405] Lagomarsino, Gina; Garabrant, Alice; Adyas, Atikah; et al. (2012): Moving towards Universal Health Coverage. Health Insurance Reforms in Nine Developing Countries in Africa and Asia. In: The Lancet, vol. 380, nr. 9845, p. 935 and 939ff.

[406] This section is partially based on a previously published article by the author, but contains substantial changes and large parts have been rewritten: Leppert (2012): Financing Health Care. The Role of Micro Health Insurance in Sub-Saharan Africa.

hygiene and sanitation measures, prevention, health education and control of the health services market by observing prices and quality. There is increasing evidence that micro health insurance units can serve as an effective SRM strategy to cope with catastrophic health care costs and, thus, can avoid households falling below the poverty line. Furthermore, there is little doubt that most micro health insurance schemes have improved access to health care services for their members.[407]

Generally, micro health insurance units operate in a wide variety of organizational forms.[408] Out of the five different models identified,[409] the most relevant models are the mutual model, the provider-based model and the partner-agent model. In the *mutual model*, following the cooperative principles, the members of the insurance scheme are both policyholders and owners and the risk-bearing entity. This type of member-owned institution is not-for-profit and usually built on democratic principles; members are involved in some or all decisions of the organization. A functioning mutual health insurance scheme requires some level of active participation of its members.[410] The members bear the financial risk and profits remain in the organization. Local coopera-tives, communities and self-help organizations running an insurance scheme are exam-ples of this mutual model.[411] In the *provider-based model*, health care providers (private or charitable clinics or hospitals) offer prepaid insurance for their clients, entitling them to use their services to a certain extent for free or at a reduced rate. The primary motivation of the provider is either to increase profit or, in case of a not-for-profit or charitable hospital, to improve cost recovery, smoothing of income flows and improved access to its services for low-income households. In the *partner-agent model,* an NGO, microfinance institution, or local organization (agent) teams up with a commercial in-surance company (partner) in order to provide insurance services for their member-ship. Both risks and profits are borne by the insurance company. From the insurer's

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[407] De Allegri, Manuela; Sauerborn, Rainer; Kouyate, Bocar; et al. (2009): Community Health Insur-ance in Sub-Saharan Africa. What Operational Difficulties Hamper Its Successful Development? In: Tropical Medicine and International Health, vol. 14, nr. 5, p. 593.

[408] For a thorough discussion of different types of micro health insurance, see: Leppert et al. (2012): Emergence of Micro Health Insurance in Sub-Saharan Africa, pp. 39–46; Radermacher, Ralf; Dror, Iddo (2006): Institutional Options for Delivering Health Microinsurance. In: Churchill, Craig (ed.): Protecting the Poor. A Microinsurance Compendium. International Labour Office / Munich Re Foundation. Geneva, Munich.

[409] Leppert et al. (2012): Emergence of Micro Health Insurance in Sub-Saharan Africa, p. 40.

[410] Leppert, Gerald; Müller, Verena (2008): Stellenwert von Partizipation in kooperativen Formen des Risikomanagements in Entwicklungsgesellschaften - eine Analyse anhand von Mikrokrankenver-sicherungen. In: Zeitschrift für das gesamte Genossenschaftswesen, vol. Sonderheft 2008, p. 111f.

[411] Fischer, Klaus; Qureshi, Zahid (2006): Cooperatives and Insurance. The Mutual Advantage. In: Churchill, Craig (ed.): Protecting the Poor - A Microinsurance Compendium. International Labour Office / Munich Re Foundation. Geneva / Munich, pp. 336–356.

point of view, the agent allows the selling of policies at low transaction costs, as the agent carries out product sales and servicing.

In Sub-Saharan Africa, the first two MHI models – the mutual model and the provider-based model – play a particularly significant role. Since the introduction of user fees, their increased development can be seen as a result of failing health care financing systems in Sub-Saharan Africa and also of failing private insurance markets, as described above. Hence, households working in the informal economy were confronted with high user fees and a far reaching exclusion from access to health care (see discussion in section 4.3.4). As a consequence, many MHI schemes have been founded aimed at ameliorating the pressing financial situation of low-income people and to improve access to health care.

While few pre-payment schemes existed in the 1970s, many health care financing schemes applying insurance principles were initiated in the late 1980s and increasingly in the 1990s. Many of these schemes were founded by faith-based organizations and as an extension of charitable hospitals that needed to improve their cost recovery. Some MHI schemes were initiated as mutual health insurance schemes without close relationship to a health care provider and with or without external or governmental support. In West and Central Africa – Benin, Burkina Faso, D.R. Congo, Ghana, Guinea, Ivory Coast, Mali, Nigeria and Senegal – MHI schemes appeared in the late 1980s and first half of the 1990s; with their emergence in Cameroon, Niger and Mauritania starting more recently.[412] In East Africa, micro health insurance grew considerably in Kenya, Tanzania and Uganda as a response to the introduction of user fees for health care services.[413]

4.3.5.1. Outreach and roles of micro health insurance in Sub-Saharan Africa

Micro health insurance increasingly plays a role in health care financing in many Sub-Saharan countries.[414] In total, over 14 million (about 1.8%) people in Sub-Saharan Africa, mostly those working in the informal sector, were covered by a micro health insurance scheme or by national health care financing systems incorporating micro health insurance, in 2009. Micro health insurance schemes, narrowly defined as those entities independent from national governments, cover about 2.1 million individuals in

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[412] Criel, Bart; Waelkens, Maria-Pia; Soors, Werner; et al. (2008): Community Health Insurance in Developing Countries, International Encyclopedia of Public Health, vol. 1, p. 784f.; see also Atim (1998): The Contribution of Mutual Health Organizations to Financing, Delivery, and Access to Health Care, p. 15ff.; Fonteneau, Bénédicte (1999): L'émergence de pratiques d'économie sociale en matière de financement de la santé au Burkina Faso. Catholic University of Leuven. Leuven, p. 32.

[413] Musau (1999): Community Based Health Insurance, p. 2ff.

[414] Criel et al. (2008): Community Health Insurance in Developing Countries.

Sub-Saharan Africa,[415] while national health care financing on the basis of micro health insurance schemes in Ghana, Rwanda and Tanzania cover, 12.2 million people. Criel et al. (2008) still counted this form of health insurance, where governments implement community-based schemes on a district level, as micro health insurance, although they argued that many aspects in these schemes resemble social health insurance arrangements.[416]

Comparing the number of covered individuals in SSA to other regions of the world (e.g. South Asia, South East Asia and Latin America), MHI (and health insurance in general) is still in its nascent stage in most Sub-Saharan African countries. In order to give an overview of the landscape of micro health insurance in Africa, a comprehensive review of literature and case studies was conducted.

Figure 3 shows the geographical distribution of micro health insurance in Sub-Saharan Africa. Three main clusters of MHI can be identified, which also differ by the main type of micro health insurance in these countries. Looking at the emergence of micro health insurance in these clusters, it is observable that certain spatial diffusion processes on innovation and information on 'micro health insurance' played an important role in its development.

The largest cluster of MHI can be identified in the countries of West Africa and some countries bordering Central Africa. The francophone West African countries, but also English-speaking West African countries and neighboring countries in Central Africa, have an especially strong history of mutual health organizations, also termed community-based health insurance or *mutuelles de santé*. For example, the West African network of mutual health organizations La Concertation reported a sixfold increase in the number of schemes from 1997-2003 in the West African Economic and Monetary Union (UMEOA).[417] In the West African cluster, only Ghana successfully integrated existing micro health insurance schemes into a national health care financing strategy (for further discussion of the Ghanaian system, see page 103 and section 4.3.6.1).

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[415] In the aforementioned study by Matul et al. (2012) using a different methodological approach, the authors counted in total 1.9 million low-income individuals in Africa that were covered with health insurance in 2010. See: Matul et al. (2012): The Landscape of Micro Health Insurance in Sub-Saharan Africa, p. 65f.

[416] Criel et al. (2008): Community Health Insurance in Developing Countries, p. 783f.

[417] La Concertation (2004): Inventaire des mutuelles de santé en Afrique - Synthèse des travaux de recherche dans 11 pays. URL: http://www.ilo.org/gimi/ RessFileDownload.do? ressourceId=82&ressFilename=82.pdf&sizeKb=634 377&longTitle=Inventaire+des+syst%E8mes+d %27assurance+maladie+en+Afrique%3A+synth %E8se+des+travaux+de+recherche+dans+11+pays&author=La+Concertation&ressYear=2004 (accessed 2010/02/09).

Fig. 3: Micro health insurance in Sub-Saharan Africa
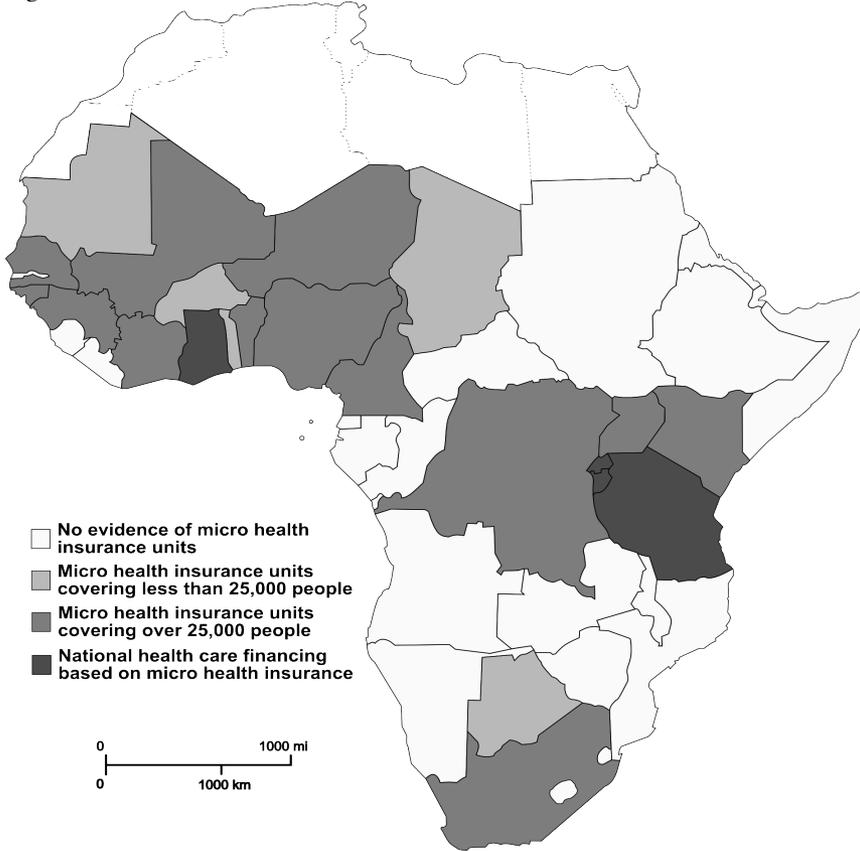
Source: based on own calculations

A few countries in East Africa, particularly Kenya and Uganda, also have a base of mu-tual health insurance schemes.[418] However, in East Africa and Central Africa (i.e. D.R. Congo), the movement of mutual health organizations was never as strong as in the West African countries. In the East-African and Central-African cluster, other types of MHI are more prominent. There, "health care providers and governments play a promi-nent role in the launch and management of [micro health insurance] schemes".[419] Typi-

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[418] Basaza, Robert; Pariyo, George; Criel, Bart (2009): What Are the Emerging Features of Community Health Insurance Schemes in East Africa? In: Risk Management and Healthcare Policy, vol. 2, p. 48f.; Halvorson, George C. (2007): Health Care Co-Ops in Uganda. Effectively Launching Micro Health Groups in African Villages. Permanente Press. Oakland, p. 124 and 151.

[419] Criel et al. (2008): Community Health Insurance in Developing Countries, p. 786.

cal examples for this development path are Tanzania, Kenya and Uganda,[420] but also D. R. Congo, where, for example, the Bwamanda hospital founded a micro health insurance scheme in 1986 and successfully operates it with over 100 000 members.[421] Matul et al. (2012) reported that private health insurance also played an increasing role in East Africa, where insurance companies increasingly also offered products suitable for the informal sector or engage in partner-agent models with community-based organizations or NGOs that provided health insurance for their members, an example being Microcare Insurance Ltd. In Uganda.[422]

The third distinct cluster of MHI is located in the wealthier countries of Southern Africa, where private health insurance has a larger outreach and a higher relevance in the national health care system. Particularly, South Africa has a long history of established mutual schemes (Medical Schemes), which operate as registered and regulated insurers, and for-profit health insurance providers. Although these schemes predominantly target high- and middle-income formal sector employees, a few of them also offer insurance products for households working in the informal economy. However, about 86% of the population in South Africa rely on tax-funded health services or out-of-pocket payments.[423] In Botswana, one private health insurance company, Itekanele Medic Aid explicitly targets informal sector households.[424] As already mentioned in section 4.3.3, Namibia and Zimbabwe also have a sizable private health insurance market; however, health insurance schemes in these countries predominantly serve wealthy formal sector employees. Matul et al. (2012) reported that regulated private insurers are the most significant player in the low-income market in these countries of

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[420] Musau (1999): Community Based Health Insurance, p. xi; Basaza, Robert; Criel, Bart; Van der Stuyft, Patrick (2007): Low Enrolment in Ugandan Community Health Insurance Schemes Underlying Causes and Policy Implications. In: BMC Health Services Research, vol. 7, nr. 105, p. 106.

[421] CDI Bwamanda (2012): Health Insurance. CDI-Bwamanda Website. URL: http://www.cdibwamanda.com/website/main/en/?mid=Healthcare&sid=HealthInsurance (accessed 2012/09/30); Criel, Bart; Kegels, Guy (1997): A Health Insurance Scheme for Hospital Care in Bwamanda District, Zaire. Lessons and Questions After 10 Years of Functioning. In: Tropical Medicine and International Health, vol. 2, nr. 7.

[422] Matul et al. (2012): The Landscape of Micro Health Insurance in Sub-Saharan Africa, p. 74f.; Dekker, Marleen; Wilms, Annegien (2009): Health Insurance and Other Risk-Coping Strategies in Uganda. The Case of Microcare Insurance Ltd. In: World Development, vol. 38, p. 370f.

[423] McIntyre, Diane; Garshong, Bertha; Mtei, Gemini; et al. (2008): Beyond Fragmentation and towards Universal Coverage. Insights from Ghana, South Africa and the United Republic of Tanzania. In: Bulletin of the World Health Organization, vol. 86, nr. 11, p. B; Söderlund, Neil; Hansl, Birgit (2000): Health Insurance in South Africa. An Empirical Analysis of Trends in Risk-Pooling and Efficiency Following Deregulation. In: Health Policy and Planning, vol. 15, nr. 4, p. 378f.

[424] Rohrdantz, Lisa-Marie; Degens, Philipp (2009): Report qualitative field research in Botswana 03/2009, Unpublished report in the project Pro-MHI-Africa.; Swami et al. (2012): Problems and Prospects of Micro Health Insurance. Case Study of Itekanele Medic Aid Scheme in Botswana.

Southern Africa.[425] A more recent trend in the East African cluster, namely Rwanda and Tanzania, is the integration of micro health insurance schemes into a nationwide health care financing strategy – similarly to the aforementioned case of Ghana (for further discussion, see page 103).[426]

Table 5 summarizes the evidence of micro health insurance schemes and their coverage. Some numbers in the table are rather vague as there was no sufficient data available for some countries.[427]

In general, table 5 reveals that micro health insurance schemes in francophone African countries are more prominent and have a larger coverage than in other African countries. There are at least three reasons for the increased adoption in francophone African countries. First, West African countries show comparatively high levels of out-of-pocket payments (see figure 5); second, most schemes strongly emphasize solidarity values among members (often in connection with and based on traditional solidarity arrangements) and third, Belgian and French in particular, but also Danish and Swedish NGOs, mutual societies and development agencies have been strongly supporting the development of mutual health insurance schemes promoting values like solidarity and "mutualité".[428] Overall, outreach of MHI remains comparatively low in Sub-Saharan Africa and schemes operate on a relatively small scale in terms of member base and risk pool size.

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[425] Matul et al. (2012): The Landscape of Micro Health Insurance in Sub-Saharan Africa, p. 74f.

[426] Logie, Dorothy E.; Rowson, Michael; Ndagije, Felix (2008): Innovations in Rwanda's Health System. Looking to the Future. In: The Lancet, vol. 372, nr. 9634; Japan International Cooperation Agency (2008): Local Level Service Delivery, Decentralisation and Governance. A Comparative Study of Uganda, Kenya and Tanzania Education, Health and Agriculture Sectors. URL: https://www.jica.go.jp/english/publications/reports/study/topical/tanzania/pdf/001.pdf (accessed 2010/02/09).

[427] No evidence for micro health insurance could be found for following countries: Angola, Central African Republic, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Lesotho, Liberia, Malawi, Mozambique, Republic of the Congo, Sierra Leone, Somalia, Sudan, Swaziland, Zambia, Zimbabwe.

[428] Criel et al. (2008): Community Health Insurance in Developing Countries, p. 784.

Tab. 5: Micro health insurance units in Sub-Saharan Africa, 2009 (independent entities)

Country	People covered	Functional schemes	Remarks on Sources
Benin	41 428	42	Atim 1998, ILO 2000, Ndiaye 2007
Botswana	12 000	1	Rohrdantz 2009
Burkina Faso	> 20 000	81	ILO 2000, Bere/Kabore 2005, Ndiaye 2007, Roth 2007, Criel 2008
Cameroon	51 637	47	ILO 2000, Ndiaye 2007, La Concertation 2007
Chad	1775	7	Moutade Naimbaye 2003, Ndiaye 2007
DR Congo	> 114 465	28	Atim 1998, Criel 1998, Musau 1999, Arhin-Tenkorang 2001
Guinea	84 820	55	Arhin-Tenkorang 2001, Ndiaye 2007
Guinea-Bissau	40 400	1	Arhin-Tenkorang 2001, Waelkens 2004
Ivory Coast	527 670	36	Atim 1998, Ndiaye 2007
Kenya	> 66 500	32	Musau 1999, ILO 2000, McCord 2007, Criel 2008
Mali	469 815	51	Atim 1998, ILO 2000, Ndiaye 2007
Mauritania	13 055	3	Ndiaye 2007
Niger	49 868	9	Ndiaye 2007
Nigeria	> 68 300	3	Atim 1998
Senegal	308 563	79	Atim 1998, ILO 2000, Ndiaye 2007
South Africa	> 134 827	3 // 180	ILO 2000, Söderlund 2000 (medical schemes mostly formal sector)
Togo	20 011	9	ILO 2000, Ndiaye 2007
Uganda	40 000	14	Musau 1999, ILO 2000, Roth 2007, Smith 2009, Basaza 2008
Total:	**> 2 065 134**	**> 501**	

Sources: own calculation based on literature review[429]

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[429]   Atim (1998): The Contribution of Mutual Health Organizations to Financing, Delivery, and Access to Health Care; International Labour Organization (2000): Health Micro-Insurance. A Compendium. Geneva; Ndiaye, Pascal; Soors, Werner; Criel, Bart (2007): Editorial: A View from Beneath. Community Health Insurance in Africa. In: Tropical Medicine and International Health, vol. 12, nr. 2; Rohrdantz et al. (2009): Report qualitative field research in Botswana 03/2009, Unpublished report in the project Pro-MHI-Africa.; Bere/Kabore, Yolande Séverine (2005): État des lieux des mutuelles de Santé au Burkina Faso. URL: http://learning.itcilo.org/ilo/step/clones/doc/mutuelles-desante/Diagnostic%20mutuelles%202005%20BURKINA.pdf (accessed 2010/02/09); Roth, Jim; McCord, Michael J.; Liber, Dominic (2007): The Landscape of Microinsurance in the World's Poorest

However, some governments have endorsed the concept and support MHI units in different ways. In Benin, Burkina Faso, Guinea and Senegal, governments acknowledge micro health insurance units, subsidize, regulate and support them.[430] As already mentioned above, Ghana, Rwanda and Tanzania went a step further and integrated micro health insurance schemes into their national health care financing strategies; MHI schemes became part of public social protection and the governments initiated new schemes on the basis of the original MHI principles.[431] The original design ideas of these systems included decentralized operating micro health insurance schemes on the local or district-level, with involvement of the communities under national regulation and coordination. Some other countries considered and developed similar strategies, e.g. Burkina Faso.[432] Burundi implemented – with limited success – another strategy

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100 Countries. MicroInsurance Centre. no place. URL: http://www.microfinancegateway.org/gm/document-1.9.29195/40 285 file 15.pdf (accessed 2011/10/28); Criel et al. (2008): Community Health Insurance in Developing Countries; La Concertation (2006): Résultats de l'inventaire 2007. URL: http://www.concertation.org/gimi/ concertation/InventoryShowSearchStat.do (accessed 2010/02/09); Moutade Naimbaye, Thomas (2003): Inventaire des systèmes d'assurance maladie en Afrique - Rapport du Tchad. URL: http://www.ilo.org/gimi/concertation/resource.do?page=/concertation/publications/carte/ tchad/Etudes_3 330 373 026_10 110.pdf (accessed 2010/02/09); Criel, Bart (1998): District-Based Health Insurance in Sub-Saharan Africa, Vol. II, vol. 10. Studies in Health Services Organisation & Policy, Part II: Case Studies. ITG Press. Antwerp; Musau (1999): Community Based Health Insurance; Arhin-Tenkorang (2001): Health Insurance for the Informal Sector in Africa. Design Features, Risk Protection, and Resource Mobilization; Waelkens, Maria-Pia; Criel, Bart (2004): Les Mutuelles de Santé en Afrique Sub-Saharienne - État des Lieux et Réflexions sur un Agenda de Recherche. Health, Nutrition and Population Discussion Paper. World Bank. no place. URL: http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPU-LATION/Resources/281 627-1 095 698 140 167/Waelkens-LesMutuelles-whole.pdf (accessed 2010/02/09); McCord, Michael J. (2007): Supplying Health Microinsurance. Lessons from East Africa. In: International Journal of Public Administration, vol. 30, nr. 8/9; Söderlund et al. (2000): Health insurance in South Africa; Smith, Anja; Hendrie, Simon; Bester, Hennie; et al. (2009): Making Insurance Markets Work for the Poor. Microinsurance Policy, Regulation and Supervision. Uganda Case Study. Consultative Group to Assist the Poor Working Group on Microinsurance. no place; Basaza, Robert; Criel, Bart; Van der Stuyft, Patrick (2008): Community Health Insurance in Uganda. Why Does Enrolment Remain Low? A View from Beneath. In: Health Policy, vol. 87, nr. 2.

[430]   Criel et al. (2008): Community Health Insurance in Developing Countries, p. 784f.

[431]   Chankova, Slavea; Sulzbach, Sara; Diop, François (2008): Impact of Mutual Health Organizations. Evidence from West Africa. In: Health Policy and Planning, vol. 23, nr. 4, p. 265; Fonteneau, Bénédicte; Galland, Bruno (2006): The Community-Based Model. Mutual Health Organizations in Africa. In: Churchill, Craig (ed.): Protecting the Poor - A Microinsurance Compendium. International Labour Office / Munich Re Foundation. Geneva / Munich, p. 393; Logie et al. (2008): Innovations in Rwanda's health system; Japan International Cooperation Agency (2008): Local Level Service Delivery, Decentralisation and Governance. A Comparative Study of Uganda, Kenya and Tanzania Education, Health and Agriculture Sectors; Saksena, Priyanka; Antunes, Adélio Fernandes; Xu, Ke; et al. (2011): Mutual Health Insurance in Rwanda. Evidence on Access to Care and Financial Risk Protection. In: Health Policy, vol. 99, nr. 3, p. 204.

[432]   Ouedraogo, Lisa-Marie (2012): 'Access for all' and 'Reaching the poor'? In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa, 1. Lit Verlag. Berlin [a.o.], p. 442ff.

with "Carte d'Assurance Maladie" (CAM), a nationwide type of provider-based insurance scheme introduced by the government for households in the informal sector.[433,434] Table 6 gives details on the outreach of these national schemes.

Tab. 6: National health care financing based on micro health insurance schemes (2009)

Country	People covered	Functional schemes	Remarks on Sources
Burundi	n/a	1	Arhin-Tenkorang 2001, Kippenberg 2008
Ghana	9 773 100	145	Atim 1998, Criel 1998, ILO 2000, Arhin-Tenkorang 2001, Sulzbach 2005, Preker 2007, Roth 2007, Ministry of Finance and Economic Planning Ghana 2008, Ministry of Health Ghana 2008
Rwanda	2 101 034	226	Diop 2000, Ndahinyuka 2004, Logie 2008, Ministère de la sante Rwanda 2004
Tanzania	330 000	68	Musau 1999, Arhin-Tenkorang 2001, Roth 2007, McIntyre 2008, Japan International Cooperation Agency 2008, McCord 2007
Total:	> 12,204,134	> 440	

Source: own calculation[435]

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[433] Arhin-Tenkorang (2001): Health Insurance for the Informal Sector in Africa. Design Features, Risk Protection, and Resource Mobilization; Kippenberg, Juliane; Sahokwasama, Jean Baptiste; Amon, Joseph J. (2008): Detention of Insolvent Patients in Burundian Hospitals. In: Health Policy Planning, vol. 23, nr. 1.

[434] In the narrow definition of micro health insurance, the CAM scheme in Burundi would not be included in the list as it is a governmental scheme. However, it is listed, because it explicitly targets the informal sector, applies a risk pooling mechanism and involves so-called "commune committees" in decision processes.

[435] Diop, Francois; Schneider, Pia; Butera, Damascene (2000): Prepayment Schemes in the Rwandan Districts of Byumba, Kabgayi, and Kabutare. Technical Report. Partnerships for Health Reform Project, Abt. Associates Inc. Bethesda, MD; Japan International Cooperation Agency (2008): Local Level Service Delivery, Decentralisation and Governance. A Comparative Study of Uganda, Kenya and Tanzania Education, Health and Agriculture Sectors; Kippenberg et al. (2008): Detention of Insolvent Patients in Burundian Hospitals; Logie et al. (2008): Innovations in Rwanda's health system; McIntyre et al. (2008): Beyond Fragmentation and towards Universal Coverage. Insights from Ghana, South Africa and the United Republic of Tanzania; Ministère de la Santé du Burkina Faso (2001): Plan national de développement sanitaire 2001-2010; Ministry of Health Ghana (2008): Independent Review - Health Sector Programme of Work 2007; Ministry of Finance and Economic Planning, Government of Ghana (2008): Press Conference with hon. Minister of State, Ministry of Finance and Economic Planning. Implementation of Measures to Reduce Economic Hardships, 2008/06/24; Ndahinyuka, Jovit (2004): Etude de cas sur les rôles des acteurs dans le développement des mutuelles de santé au Rwanda. URL: http://www.ilo.org/gimi/concertation/resource.do?page=/concertation/publications/carte/rwanda/Etudes_3341214645_8911.PDF (accessed 2010/02/09); Preker, Alexander S.; Scheffler, Richard M.; Bassett, Mark C. (eds.) (2007): Private Voluntary Health Insurance in Development. Friend Or Foe. The World Bank. Washington, D.C.; Sulzbach, Sara; Garshong, Bertha; Owusu-Banahene, Gertrude (2005): Evaluating the Effects of the

Table 6 shows that the national systems, building on the idea of MHI, were able to substantially increase outreach and membership of micro health insurance and health insurance in general. The efforts of national health care financing built on micro health insurance schemes lead to many advantages, such as improved outreach, coverage and awareness, but also show major drawbacks, such as problems resulting from officialization and reduced independence of the schemes. The example of Ghana is further elaborated in section 4.3.6.1.

4.3.5.2. Challenges of micro health insurance in Sub-Saharan Africa

Although microinsurance schemes aim at filling a gap in social health risk management strategies and the number of covered people have been on the rise for over twenty years, overall enrollment rates remain low in Sub-Saharan Africa, despite successful outreach in other regions, e.g. in India. Several challenges that are (to a certain extent) unique to Sub-Saharan Africa have been identified and are discussed below.

In a 2004 synthesis of eleven country studies, the West African network La Concertation found that financial viability of mutual health organizations is a major problem. 5.3% of the schemes observed in the study were in financial trouble and unable to cover the claims of their members.[436] Furthermore, in a study on community-based health insurance units in Africa, Fonteneau et al. (2006) mentioned several challenges that the schemes face.[437] One challenge mentioned was small risk pools, which may lead to financial instability. In a study by Fonteneau on mutual MHI schemes, around 95% of the schemes in Sub-Saharan Africa covered less than 1000 persons.[438] According to Fonteneau, the origins lay in limited capacities of the initiating organizations, from a technical and marketing perspective, and the problem of reaching people outside the original member base. In this regard, attributes like religion, ethnicity or gender can have limiting effects on an extension of the member base.[439] Negative effects of a small risk pool were clearly demonstrated by Dror et al. using a statistical simulation of micro health insurance schemes, based on real data from a large insurance provider in Ireland. Insurance schemes with an average membership of 1203 members have the

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National Health Insurance Act in Ghana. Baseline Report. PHRplus (Partners for Health Reformplus), USAID. Bethesda, Maryland.

[436] La Concertation (2004): Inventaire des mutuelles de santé en Afrique - Synthèse des travaux de recherche dans 11 pays, p. 9.

[437] Fonteneau et al. (2006): The Community-Based Model. Mutual Health Organizations in Africa.

[438] Ndiaye et al. (2007): Editorial: A View from Beneath. Community Health Insurance in Africa.

[439] Fonteneau et al. (2006): The Community-Based Model. Mutual Health Organizations in Africa, p. 386f.; Ndiaye et al. (2007): Editorial: A View from Beneath. Community Health Insurance in Africa, p. 159.

probability of insolvency of no less than 34%, if they could store 10% capital loading for safety reasons on top of the premium, the so-called safety margin. Still, 21.4% of the schemes would become insolvent at a safety margin of 20%. On the contrary, the risk of becoming insolvent can be reduced significantly to 7.5%, if the membership can be extended to an average of about 2604 members.[440] Due to the problems arising from small risk pools, micro health insurance schemes in West and Central Africa, for example in Cameroon, Mali, Senegal, Benin or Guinea, have started to build networks and implement common funds, such as reinsurance funds or high-risk funds, ameliorating the problems with small risk pools.[441]

Low subscription rates, resulting in a small risk pool, can have multifaceted reasons. The availability of quality health care providers, in especially in rural areas, is crucial for the success of a micro health insurance scheme. In Ghana, for example, all specialized hospitals are located in the Greater Accra region, although the majority of people live in rural areas. Often the low quality of public health care providers (i.e. hospitals) reduces confidence in a micro health insurance scheme to fulfill its purpose. Besides the lack of medical infrastructure, De Allegri et al. mentioned as an important factor the "lack of clear legislative and regulatory framework" for micro health insurance units in most countries in Sub-Saharan Africa.[442,443]

The benefit package of an insurance scheme depends on premium payments. If premium payments are low or irregularly paid during collection periods, the micro health insurance scheme has three basic possibilities of achieving financial stability. Either the micro health insurance scheme further limits the benefit package, so that certain services are not included at all or only at a very low level, or it restricts payouts up to a certain ceiling or pays out only above a certain amount of expenditures (≈co-payments). A third option is a strict handling of exclusions, e.g. excluding pre-existing or chronic illnesses or persons above a certain age. The latter option is not commonly used, because exclusions thwart the social function of micro health insurance schemes

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[440] Dror, David M.; Armstrong, J.; Kalavakonda, V. (2005): Why Micro Health Insurance Schemes Cannot Forego Reinsurance. In: Journal of Insurance and Risk Management (Special Issue on Micro Health Insurance), vol. 4, nr. 7, p. 9ff.

[441] Njamnsi, Mildred Kongla (2012): Integrating Paupers into Mutual Health Organizations. The Community Model. A Report from Cameroon. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa, 1. Lit Verlag. Berlin [a.o.], p. 388f.; Fonteneau et al. (2006): The Community-Based Model. Mutual Health Organizations in Africa, p. 388ff.; Leppert (2012): Operating on the Edge. How to Counter Insurance-Related Financial Risks in Micro Health Insurance Beyond the Scope of a Single Organization, p. 242ff.

[442] De Allegri et al. (2009): Community health insurance in sub-Saharan Africa, p. 587 and 590.

[443] Efforts have been made recently to improve legislation and regulation for micro health insurance units in West Africa. In 2009, the network La Concertation developed a new legislation for the West African Economic and Monetary Union (UEMOA) to be adopted by its member countries.

and conflict with basic values like solidarity and reciprocity. In Sub-Saharan Africa, the first option, to strongly limit the benefit package, is chosen by many micro schemes. Due to the excessive costs of some illnesses, they may be excluded from the benefit package (e.g. HIV/AIDS and opportunistic diseases or hospitalizations). Therefore, people attracted by low premiums sometimes get disappointed by the heavy restrictions on reimbursements and high dropout rates are the consequence. However, reasons for high drop-out rates can also be rooted in a poor understanding of the underlying principles of insurance or a conscious reluctance to it among some members. If an individual or a household stays healthy over the entire financial year of the insurance, they usually do not get any payout and, therefore, they might not be willing to renew their policies. People who were not sick during a period, often expect to get a refund of (part of) the premium. Most micro health insurance schemes are aware of this problem and include special services (not related to the core function of an insurance scheme) like free health checks for all members during a business year.

Besides issues concerning member size and limited benefits, technical and management skills have been identified as crucial problems influencing the success of a scheme, although measures for improvement have been undertaken during the last years.[444] Insurance products need actuarial knowledge and managing a financial institution needs considerable business skills. Micro health insurance schemes usually operate on a very low scale and often lack personnel with comprehensive management skills. The administration is often based on voluntary work by an inexperienced and fluctuating staff. These deficiencies are often answered with flexibility (e.g. in amounts of reimbursement or in handling rules) and closeness to the members, with mixed success.

To solve some of the aforementioned problems, micro health insurance units join networks, form unions or federations of micro schemes in order to lobby for a place in the governmental regulatory framework, to give financial support to the member organizations, e.g. through reinsurance mechanisms and to give technical support and trainings.[445]

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[444] Fonteneau et al. (2006): The Community-Based Model. Mutual Health Organizations in Africa, p. 388; De Allegri et al. (2009): Community health insurance in sub-Saharan Africa, p. 591.

[445] Ndiaye et al. (2007): Editorial: A View from Beneath. Community Health Insurance in Africa, p. 160; Criel et al. (2008): Community Health Insurance in Developing Countries, p. 784f.; De Allegri et al. (2009): Community health insurance in sub-Saharan Africa, p. 587ff.

4.3.5.3. Relevance of micro health insurance as social risk management strategy in Sub-Saharan Africa

As elaborated on in section 3.3, health insurance is one of the several possible social risk management strategies in response to health risks. As discussed, risk pooling, the core principle behind health insurance, is widely perceived as a suitable SRM strategy to deal with the particular nature of health risks (see section 2.4). Health insurance is most effective if the risk pool size is large enough and if risk-pooling occurs between different income groups, which is the case in social health insurance schemes. For micro health insurance schemes reaching an efficient risk pool size is a challenge. It is also difficult to attract different income groups to join a common risk pool in a voluntary scheme. Hence, MHI reaches its significance in the absence of (inclusive) social insurance schemes. The ability of micro health insurance to pool risks over a comparatively large group of individuals gives it an advantage over other SRM strategies (e.g. self-insurance or informal risk-sharing arrangements). Those SRM strategies can easily be overburdened by high health care expenditures and health risks that show a high level of autocorrelation, as discussed in section 2.1. Alwang et al. (2005) saw microinsurance as a valuable extension to the SRM strategies savings and credit, because insurance explicitly deals with risk management and, therefore, microinsurance could be "viewed as a potential SRM tool to reduce vulnerability".[446] However, Alwang et al. noted that the impact of microinsurance on the reduction of vulnerability depends on the comprehensiveness of the entire set of SRM strategies. They cautiously added that – keeping operational limitations and market constraints in mind – microinsurance "is best able to address idiosyncratic, low loss events, and the financial viability of the [microinsurance scheme] may be enhanced if it covers single-event types of risk".[447] Micro health insurance is widely acknowledged as a useful SRM strategy, but their capacity to deal with high-loss, (inter)correlated risks is debated as well as the size of the positive impacts. More recent impact assessments of micro health insurance showed that MHI schemes were able to protect low-income households from catastrophic health care costs and improve access to health care, within their operational limits. Many studies also indicated that MHI schemes had some positive impact on type and quality of care.[448] Hence, MHI schemes – within their limits – successfully fill the gap

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[446] Alwang et al. (2005): Viewing Microinsurance As A Social Risk Management Instrument: Potential and Limitations, p. 43.

[447] Ibid., p. 56 and 63ff.

[448] Radermacher, Ralf; McGowan, Heidi; Dercon, Stefan (2012): What is the impact of microinsurance? In: Churchill, Craig; Matul, Michal (eds.): Protecting the Poor. A Microinsurance Compendium, vol. 2. International Labour Office / Munich Re Foundation. Geneva/Munich, p. 66 and 81.

in social risk management as the only provider of the SRM strategy *risk-pooling* when "both governments and markets fail to deliver financial protection against sickness of the poor".[449,450]

The figures above (tables 5 and 6) show that both micro health insurance units organized in different institutional types and social health insurance schemes driven by governments increasingly play a role in Sub-Saharan Africa. The spatial distribution of health insurance that also covers households in the informal sector shows a concentration in West Africa, East Africa and a few countries in Central Africa. The outreach of micro health insurance schemes and social health insurance schemes is still very low in SSA, covering only a very small percentage of households. Additionally, many countries had difficulties to thoroughly support MHI schemes or to implement a social health insurance schemes, as in the case of Nigeria.[451] Few studies have empirically analyzed the actual role of (micro) health insurance within (complex) sets of social risk management strategies. This is done in the following section by comparing Ghana's and Malawi's approach to health care financing and the SRM strategies applied by individuals and households to counter health risks.

4.3.6. Health care financing systems in Ghana and Malawi

4.3.6.1. System of health care financing in Ghana[452]

Ghana's approach to health care financing has changed significantly over time. After its independence in 1957, the government of Ghana removed the previously existing user fees at point of service, aimed at the provision of health care services for free through tax-financing. However, due to the stagnating Ghanaian economy in the early 1970s, a decline in health care quality, shortages of essential drugs, and perceived overuse of services, the government decided to reintroduce small health care user fees at point of service in 1972.[453] In the 1970s and 1980s, the Ghanaian health care system was characterized by a lack of reasonable access to health care in many rural areas, a

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[449] Dror et al. (2002): The Role of Communities in Combating Social Exclusion, p. 44.

[450] Alwang et al. (2005): Viewing Microinsurance As A Social Risk Management Instrument: Potential and Limitations, p. 63.

[451] Onwujekwe, Obinna E.; Uzochukwu, Benjamin SC; Obikeze, Eric N.; et al. (2010): Investigating Determinants of Out-of-Pocket Spending and Strategies for Coping with Payments for Healthcare in Southeast Nigeria. In: BMC Health Services Research, vol. 10, nr. 1, p. 2.

[452] This section is partially based on a previously published article by the author Leppert (2012): Financing Health Care. The Role of Micro Health Insurance in Sub-Saharan Africa.

[453] Agyepong, Irene Akua; Adjei, Sam (2008): Public Social Policy Development and Implementation. A Case Study of the Ghana National Health Insurance Scheme. In: Health Policy and Planning, vol. 23, nr. 2, p. 154.

demoralized and underpaid staff, under-the-table payments and deteriorating quality of service.[454] In 1985, Ghana finally diverged from the initial goal of providing health care services for free or at very low fees, when the government introduced the so-called "cash-and-carry" system, a considerable increase in user fees with the aim of improving the overall cost-recovery of health care services and the entire health sector. With its policy of raising substantial user fees, Ghana followed the typical trend of countries in Sub-Saharan Africa, which was triggered by financial constraints, unacceptable quality standards in health care and requirements by the IMF structural adjustment policies as previously described in section 4.3.4.

In the 1990s, as the aforementioned negative public health impacts of user fees became more apparent, particularly for rural households and those working in the informal sector, the search for alternative solutions began.[455] Remedies, such as the 1997 introduction of partial user fee exemptions for vulnerable groups, did not solve the fundamental problems.[456] As a result, different actors created multiple community-based and charitable provider-based micro health insurance schemes to ameliorate catastrophic health care costs and the effects of foregone treatment on people's health status. In 2001, Atim et al. counted at least 47 operational mutual health organizations in the country.[457] Later, in a national effort, Ghana introduced the country-wide National Health Insurance Scheme (NHIS), a partially contribution-based and partially tax-financed health insurance scheme explicitly targeting the informal sector.[458] In October 2003, the Ghanaian government enacted the law for the National Health Insurance Scheme (NHIS) aimed at access to proper health care financing for all Ghanaian citizen. The law formed District-wide Mutual Health Insurance Schemes (DMHIS) either based on existing mutual health organizations or new schemes, in those districts where previously no insurance scheme was present (large enough in terms of outreach and scope of membership).[459] This fundamental design was the result of many years of bad

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[454]   Chankova, Slavea; Atim, Chris; Hatt, Laurel (2010): Ghana's National Health Insurance Scheme. In: Escobar, Maria-Luisa; Griffin, Charles C.; Shaw, R. Paul (eds.): Impact of Health Insurance in Low- and Middle-Income Countries. Brookings Institution Press. Washington, D.C., p. 60.

[455]   Waddington, C. J.; Enyimayew, K. A. (1989): A Price to Pay. Part 1. The Impact of User Charges in Ashanti-Akim District, Ghana. In: International Journal of Health Planning and Management, vol. 4, nr. 1, p. 18 and 41; Asenso-Okyere, Kwadwo (1995): Financing Health Care in Ghana. In: World Health Forum, vol. 16, p. 91.

[456]   Chankova et al. (2010): Ghana's National Health Insurance Scheme, p. 60.

[457]   Atim, Chris; Grey, Steven; Apoya, Patrick; et al. (2001): A Survey of Health Financing Schemes in Ghana. PHRplus - Partners for Health Reformplus Project, Abt. Associates Inc., USAID. Bethesda, Maryland, p. 36.

[458]   Government of Ghana (2003): National Health Insurance Act.

[459]   Ibid.; Government of Ghana (2004): Legislative Instrument 1809 - National Health Insurance Regulations.

experiences with catastrophic out-of-pocket payments for health care, due to the cash-and-carry system, and good experiences with the increasingly successful mutual health organizations, that had rapidly spread throughout the country since 1992. Some of these schemes served as a good example for the Ministry of Health in the design of a potential national health insurance scheme.[460]

Regarding the design of the NHIS, the main innovation was the integration of community-based mechanisms with a contribution system and nationwide risk pooling. The government decided to diversify the income sources for the National Health Insurance Fund (NHIF). However, the funding was not based only on premium payments by members. In addition to member premiums, the government increased the revenues of the insurance schemes with a payroll deduction of 2.5% from formal sector workers, via the retirement fund Social Security and National Insurance Trust (SSNIT) and an earmarked percentage (2.5%) of the value added tax (VAT), called the National Health Insurance Levy. This arrangement made it possible to bear the scheme's losses and to include the coverage of certain groups, who were exempt from paying insurance premiums. These groups were children under eighteen, if at least one parent held an insurance card, the very-poor (indigents) and elderly above 70 years.[461] In 2008, additional groups were exempt from the insurance premium, such as pregnant women, in order to meet Millenium Development Goals 4 and 5.[462] For adults working in the informal sector, the annual premium level was set at 7.2 - 48 Ghana Cedis, depending on their economic situation, although DMHIS tended to apply a flat rate premium as the households' ability to pay was difficult to assess.[463] For example, the Nkoranza DMHIS applied a premium rate of 10 GHS (~4.97€) (2007), the Offinso DMHIS 15 GHS (~11.03€) (2007), and the partner schemes which were the subject of the empiric study Dangme West DMHIS 7.2 GHS (~3.58€) (2009), while some more wealthy individuals paid higher premium levels, and West Gonja DMHIS 10 GHS (~4.97€) (2009).[464] An adminis-

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[460]   Atim et al. (2001): A Survey of Health Financing Schemes in Ghana, p. 5 and 53.

[461]   Appiah-Denkyira, Ebenezer; Preker, Alexander (2007): Reaching the Poor in Ghana with National Health Insurance. An Experience from the Districts of the Eastern Region of Ghana. In: Deutsche Gesellschaft für technische Zusammenarbeit (GTZ) (ed.): Extending Social Protection in Health: Developing Countries' Experiences, Lessons Learnt and Recommendations. GTZ, ILO, WHO; Saleh, Karima; Schieber, G; Lavado, Rouselle; et al. (2012): Health Financing in Ghana. World Bank. Washington D.C., p. 23.

[462]   Ghana National Health Insurance Authority (2011): Annual Report 2010, p. 19. URL: http://www.nhis.gov.gh/annualreport.aspx (accessed 2014/08/19).

[463]   Akazili, James; Gyapong, John; McIntyre, Diane (2011): Who Pays for Health Care in Ghana? In: International Journal for Equity in Health, vol. 10, nr. 26, p. 4.

[464]   Annual average exchange rates GHS to EUR, source www.oanda.com: 0.7352 (2007), 0.4972 (2009).

tration fee of 2-3 GHS was charged on top of the premium.[465] In 2009, all over the country, 145 DMHIS were operating, with ten regional offices and a network of accredited health care providers, comprising 1930 health care facilities.[466]

According to official figures by the National Health Insurance Authority (NHIA), in 2010, the NHIS in Ghana covered 8.16 million people (active membership), representing 34% of the entire population, seven years after the inception of the NHIS.[467] Only slightly more than one third of total NHIS members (36.03%) contributed to the NHIF: 29.40% of total members were informal adults paying an annual premium, 6.10% were formal sector employees contributing 2.5% of their payroll via SSNIT, 0.53% were formal sector pensioners also contributing via SSNIT. All other groups that accounted for 63.97% were exempt from the membership premiums: 49.44% children aged below 18 years, 6.67% adults aged 70 years and above, 2.32% indigents (exempt groups based on means and poverty testing), and 5.54% pregnant women.[468]

Tab. 7: Sources of funding of Ghana NHIS (2009)

Sources of funding	Percentage
National health insurance levy (earmarked 2.5% of VAT)	61.0%
Investment income of the NHIF	17.0%
SSNIT contribution	15.6%
Insurance premium	3.8%
Sector budget support	2.3%
Other income	0.2%

Source: Ghana National Health Insurance Authority: Annual Report 2009.[469]

Table 7 shows the income flows of the NHIS. The most significant source of funding was the national health insurance levy, which accounted for 61.0% of total funding, fol-

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[465] Nguyen, Ha Th; Rajkotia, Yogesh; Wang, Hong (2011): The Financial Protection Effect of Ghana National Health Insurance Scheme. Evidence from a Study in Two Rural Districts. In: International Journal for Equity in Health, vol. 10, nr. 4, p. 5.

[466] Ghana National Health Insurance Authority (2010): Annual Report 2009, p. 16. URL: http://www.nhis.gov.gh/annualreport.aspx (accessed 2014/08/19).

[467] The NHIS membership numbers until 2009 have been officially declared as inaccurate. They referred to a 'cumulative membership base' which did not reflect the active membership, as it includes NHIS members who did not renew their membership cards. Hence, it was decided to quote the 2010 figure which is much lower, but more accurate, than the 2009 figure which was at 12.5 million active members and 14.5 million total membership. Ibid., p. 14, 26 and 29; Description of inaccuracies in membership calculation and 2010 figures:: Ghana National Health Insurance Authority (2011): Annual Report 2010, p. 16.

[468] Data from year 2009 are used. Percentages refer to the cumulative total membership of the NHIS (not necessarily active members). Ghana National Health Insurance Authority (2010): Annual Report 2009, p. 26.

[469] Ibid., p. 34.

lowed by investment income of the NHIF with 17.0%. Contributions from formal sector employees via the SSNIT accounted for 15.6%, while contributions of informal sector workers accounted for 3.8% of total funding.

In comparison to the benefit packages that had been offered under the previously existing mutual health organizations, the benefit package for the insured was substantially improved in the NHIS and included a variety of drugs, out-patient, in-patient, oral health, eye care, maternity care and emergency services.[470]

Since the inception of the NHIS, national health care utilization patterns have changed, although not at a rapid pace. From 1998/99 to 2005/06, the number of individuals with an illness or injury that did not utilize health care went down by 28.6%, from 56.2% to 40.1%, according to Schieber et al. (2012).[471] Chankova et al. (2010), in a comparative cross-sectional study, showed that seeking care from a modern health care provider nearly doubled from 2004 (before inception of the NHIS) to 2007, from 37% to 70%, and pointed out that seeking care from an informal provider fell at the same time from 76% to 44%; average spending for treatment also fell significantly.[472] The effect was similarly strong when insured and uninsured households were directly compared. For example, Schieber et al. (2012) reported that the utilization of government hospitals was 38.6% for insured individuals and 22.0% for uninsured individuals in 2008. Restricting the analysis to the lowest wealth quintile, a higher discrepancy in utilization was identified between insured (39.2%) and uninsured (11.9%) individuals. Also, much less insured individuals forewent treatment (2.6%) compared to 9.9% of uninsured individuals.[473] In a study on the financial protection of the NHIS in two rural districts in 2007, Nguyen et al. (2011) reported that insured households still occured out-of-pocket payments: for uncovered services, from informal health care providers, but also for services that should be covered by the NHIS, such as drugs, tests, antenatal care or hospitalization.[474] They concluded that the NHIS has a financial protection effect, particularly among the poorest quintile, as it "significantly reduced the probability of catastrophic OOP payment on health services",[475] However, according to Schieber et al. (2012) there were membership equity concerns; using data from 2009, they found that, in the highest wealth quintile, women were 71% more likely and men 100% more likely to hold an NHIS card, compared to the same group in the lowest wealth quintile, de-

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[470] Ibid., p. 42f.
[471] Saleh et al. (2012): Health Financing in Ghana, p. 41f.
[472] Chankova et al. (2010): Ghana's National Health Insurance Scheme, p. 71f.
[473] Saleh et al. (2012): Health Financing in Ghana, p. 41f.
[474] Nguyen et al. (2011): The financial protection effect of Ghana National Health Insurance Scheme, p. 1 and 10.
[475] Ibid., p. 8f.

spite exemptions for poor households.[476] This result was confirmed by Sarpong et al. (2010) who reported that 21% of those households with low socio-economic status (SES) were insured with the NHIS compared to 60% of households with high SES.[477]

The NHIS has faced a variety of problems, ranging from slow administration, to mismanagement and fraud on multiple levels.[478] The NHIS has been confronted with rising costs, so that increasingly DMHIS were in distress and had to inquire at the NHIA for additional funding. In 2010, expenditures outpaced revenues for the first time, so that capitation payments were discussed.[479] The initial decentralized design of the NHIS, with the DMHISs as main actors, has subsequently been changed by central-izing tariff negotiations with health care providers and claim settlements. Since 2009, the new Ghanaian government, led by John Atta-Mills from the National Democratic Congress (NDC), changed the future direction of the scheme, breaking the initial in-tentions of the scheme's design. The NDC carried out several changes towards further centralization of the NHIS and announced a decision to shift the system increasingly to a tax-financed base and pushed the idea of a life-time membership without annual premium payments.[480] This plan of a one-time premium raised substantial concerns, but finally seemed to be put on hold.[481]

4.3.6.2. System of health care financing in Malawi

After Malawian independence in 1964, the government has never diverged from the ul-timate objective of providing health care services at public health care facilities for free, although the health sector shows signs of severe underfunding, raising major quality concerns.[482] Since 2005, the Malawian government has implemented the so-called Essential Health Package (EHP), which included high impact and cost-effective health care services without user fees and without insurance premium or user contri-

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[476] Saleh et al. (2012): Health Financing in Ghana, p. 40.

[477] Results are based on a household survey from 2008. Sarpong, N.; Loag, W.; Fobil, J.; et al. (2010): National Health Insurance Coverage and Socio-Economic Status in a Rural District of Ghana. In: Tropical Medicine and International Health, vol. 15, nr. 2, p. 195.

[478] Chankova et al. (2010): Ghana's National Health Insurance Scheme, p. 63f.

[479] Lagomarsino et al. (2012): Moving towards universal health coverage, p. 937.

[480] Modernghana (2009): One-time NHIS next year. June 16, 2009. URL: http://www.modernghana.-com/print/222096/1/one-time-nhis-next-year.html (accessed 2009/07/04); National Democratic Congress (NDC) (2008): Manifesto for a Better Ghana 2008; Ghana National Health Insurance Au-thority (2010): Annual Report 2009, p. 16f.

[481] Schieber, George; Cashin, Cheryl; Saleh, Karima; et al. (2012): Health Financing in Ghana. World Bank Publications. Washington D.C., p. 161f.; Bentil, Naa Lamiley (2013): NHIS one time premium on hold, Modern Ghana. URL: http://www.modernghana.com/news/493246/1/nhis-one-time-pre-mium-on-hold.html (accessed 2015/07/26).

[482] Lüftl, Stefan (2002): Staatliche Entwicklungszusammenarbeit: Malawi - (k)ein hoffnungsloser Fall. In: Deutsches Ärzteblatt, vol. 48/99.

butions, coordinated and financed through the health Sector-Wide Approach (SWAp) to which various international donors contribute.[483]

Tab. 8: Intervention areas and included services of the Essential Health Package

Vaccine preventable diseases (P,T)
Malaria (P,T)
Reproductive health, incl. safe motherhood initiatives, essential obstetric care, prevention of mother-to-child transmission (I)
Tuberculosis and related complications (P,C,T)
Schistosomiasis (P,T)
Acute respiratory infections and related complications (M)
Acute diarrheal diseases (incl. Cholera) (P,T)
HIV/AIDS, sexually transmitted infections, related complications, incl. VCT, ART (P,M)
Malnutrition, nutrition deficiencies and related complications (P,M)
Eye, ear and skin infections and related complications (M)
Common injuries, incl. Emergency care for accidents, trauma and their complications (T)

Notes: P=Prevention, T=Treatment, I=Interventions, C=Control, M=Management
Source: African Development Fund Health Development Division (2005): Appraisal Report. Support to the Health Sector Programme Republic of Malawi. p. 4f.

Generally, the health sector in Malawi is heavily dependent on external resources: In 2009, over two thirds of the total expenditure on health was contributed by external donors (80.2%).[484]

The EHP was part of the poverty reduction strategy of the Malawian government and was the primary health strategy for the Ministry of Health. The EHP aimed at improving access to primary health care services and prevention measures concerning the major causes of morbidity and mortality of the Malawian population.[485] Table 8 shows the services covered by the EHP. The WHO Commission on Macroeconomics and Health recommended USD 34 (2007) per capita for "a package of basic, cost-effective health care interventions" and estimated the real cost of the Malawian EHP at USD 28.6 (2007/2008). On the contrary, the actual total health expenditure per capita (including private payments) has been measured at only US$ 21 in 2006 and US$ 20 in 2007.[486] In an assessment of the EHP, Bowie et al. (2011) concluded that the EHP was

[483] Gwatkin, Davidson; Kataika, Edward; Cardinal, Isabell; et al. (2006): Malawi's Health SWAp. Bringing Essential Services Closer to the Poor? In: Malawi Medical Journal, vol. 18, nr. 1, p. 1.

[484] World Health Organization (2014): Malawi - National Expenditure on Health (Malawian Kwacha). URL: http://apps.who.int/nha/database/Key_Indicators_by_Country/Index/en (accessed 2014/08/19).

[485] African Development Fund Health Development Division (2005): Appraisal Report. Support to the Health Sector Programme Republic of Malawi, p. 4f.

[486] Government of Malawi - Ministry of Health (2007): Malawi National Health Accounts (NHA) 2002-2004 with Sub-Accounts for HIV and AIDS, Reproductive and Child Health. Lilongwe; Bowie, Cameron; Mwase, Takondwa (2011): Assessing the Use of an Essential Health Package in a

seriously under-funded so that only half of the funds for the required annual expenditures per capita were available. Still, the authors reported that EHP service utilization has been increasing over the years and about two thirds of the estimated number of treatments required under the EHP had been delivered. However, due to this mismatch in funding and actual service delivery and due to lack of staff and large numbers of patients, they argued that "quality of care is likely to have been compromised".[487] Such problems were confirmed by Mueller et al. (2011) who reported major difficulties to even deliver the defined EHP, as there was evidence on continuous and major deficiencies in human resources and drug supply, as well as problems associated with lack of resources, but also problems with governance, incentives and accountability.[488]

Quality of health care has been criticized by various authors concluding that access to quality health care in Malawi was still below acceptable levels by international standards: As mentioned above, financial and human resource gaps as well as shortages in drug availability at public facilities have been highlighted. This has led to the migration of health professionals abroad, illegal sale of free drugs, low quality of health care, long waiting times in public facilities as well as private treatments by publicly employed doctors along with high out-of-pocket payments.[489] These problems were obvious indications of government failure; however, the Malawi Ministry of Health has been aware of these shortcomings and expressed its inability to solve these issues in the short run, especially in remote and rural areas. As the Malawian health system has been predominantly publicly funded and still lacks essential services and quality, increasingly, the introduction of user payments has been discussed. User fees have been charged in CHAM mission health centers and hospitals as well as private facilities;

Sector Wide Approach in Malawi. In: Health Research Policy and Systems, vol. 9, nr. 4, p. 4; Per capita total expenditure on health at average exchange rate (US$): World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics.

[487] Bowie et al. (2011): Assessing the Use of an Essential Health Package in a Sector Wide Approach in Malawi, p. 5f. and 9.

[488] Mueller, Dirk H.; Lungu, Douglas; Acharya, Arnab; et al. (2011): Constraints to Implementing the Essential Health Package in Malawi. In: PLoS ONE, vol. 6, nr. 6, p. e20741.

[489] Lüftl (2002): Staatliche Entwicklungszusammenarbeit: Malawi - (k)ein hoffnungsloser Fall; Mendis, Shanti; Fukino, Keiko; Cameron, Alexandra; et al. (2007): The Availability and Affordability of Selected Essential Medicines for Chronic Diseases in Six Low- and Middle-Income Countries. In: Bulletin of the World Health Organization, vol. 85, nr. 4; Ministry of Health (Malawi) (2007): Malawi National Health Accounts (NHA) 2002/2003-2004/2005. URL: http://www.who.int/nha/country/Malawi-NHA_2002_03-2004_05.pdf (accessed 2010/02/09); Muula, Adamson S.; Maseko, Fresier C. (2006): How Are Health Professionals Earning Their Living in Malawi? In: BMC Health Services Research, vol. 6; Record, Richard; Mohiddin, Abdu (2006): An Economic Perspective on Malawi's Medical 'Brain Drain'. In: Globalization and Health, vol. 2, nr. 12; Zere, Eyob; Moeti, Matshidiso; Kirigia, Joses; et al. (2007): Equity in Health and Healthcare in Malawi. Analysis of Trends. In: BMC Public Health, vol. 7.

both perceived to provide services of better quality compared to public health care facilities.[490] For some services, even at public health care facilities, considerable direct health care costs have applied for fees and drugs that had to be purchased by the patient outside of the facility.[491] In an analysis of the health financing system in Malawi by Zere et al. (2010), the authors documented the underfunding of the health sector and the EHP and called for a substantial increase in governmental spending on health. They also reported that the dependency of the health sector on external resources had increased, but concluded that – due to the economic situation of Malawi – a further increase of contributions by donor countries was needed in the short to medium-term. Furthermore, they suggested the development of a prepaid mechanism, i.e. a health insurance scheme, to facilitate progress towards universal health coverage.[492]

For health care provision, Malawi has relied on a public-private mix of health care providers. The majority of health care services in Malawi have been provided by public health care facilities (about 60%). The Christian Health Association of Malawi (CHAM) is the umbrella organization of charitable, faith-based health care providers run by different churches. In 2010, CHAM delivered approximately 37% of all health care services, with 80% of its facilities in remote and under-served rural areas. Private health care facilities provided the remaining percent of health care provision.[493] CHAM facilities are not-for-profit and charge moderate user fees for their services. Since 2004, CHAM facilities have been subsidized by the Ministry of Health via service level agreements (SLAs) in order to provide services for free to vulnerable and underserved populations, with a focus on maternal and neonatal services. However, Chirwa et al. (2013) raised criticism on the SLA system and reported, for example, late payment of bills by the government and lack of transparency.[494] McIntyre et al. (2013) attributed

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[490] Kavinya, Thengo (2013): Opinions on the Suggestion that Malawians Should Start Paying for Health Services in a Bid to Improve Health Care in the Country. In: Malawi Medical Journal, vol. 25, nr. 1, p. 26.

[491] An analysis of direct and opportunity costs for tuberculosis diagnosis, see: Kemp, Julia R.; Mann, Gillian; Simwaka, Bertha Nhlema; et al. (2007): Can Malawi's Poor Afford Free Tuberculosis Services? Patient and Household Costs Associated with a Tuberculosis Diagnosis in Lilongwe. In: Bulletin of the World Health Organization, vol. 85, nr. 8, p. 582.

[492] Zere, Eyob; Walker, Oladapo; Kirigia, Joses M.; et al. (2010): Health Financing in Malawi. Evidence from National Health Accounts. In: BMC International Health and Human Rights, vol. 10, p. 5 and 8–10.

[493] Phiri, Innocent; Masanjala, Winford (2012): Willingness to Pay for Micro Health Insurance in Malawi. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa, 1. Lit Verlag. Berlin, p. 286; CHAM ran 169 health care facilities in Malawi: Christian Health Association Malawi (CHAM) (no date): Map of 169 Health Facilities; Maseko, Fresier Chidyaonga (2010): Social Health Insurance in Malawi. Draft Version 1.2, p. 10.

[494] Chirwa, Maureen; Kazanga, Isabel; Faedo, Giulia; et al. (2013): Promoting Universal Financial Protection. Contracting Faith-Based Health Facilities to Expand Access. Lessons Learned from

these problems to the inability and capacity constraints of the MoH and its district health offices, in charge of carrying out the SLAs, to make timely payments, to supply drugs and to supervise and monitor the contracted facilities. Due to general under-funding and due to these organizational constraints at the district level, some CHAM facilities stopped providing 'free' services under such circumstances.[495]

Health insurance currently plays a minor role in Malawi. In 2009, Malawi was serviced by only two health insurance companies, the Medical Aid Society Malawi (MASM), which controled 80% of the private health insurance market in Malawi, and OASIZ Medical Aid Scheme, which provided employer-based health insurance contracts mainly in the parastatal sector. MASM had a wider focus as it provides health insurance in employer-based or individual contracts, but also concentrated on formal sector employees in mostly urban areas.[496] A variety of companies and organizations run their own medical aid schemes for their employees, such as the National Bank of Malawi scheme (NABMAS) or the University of Malawi scheme (UNIMAID) that subsidize a large percentage of health care costs.[497]

None of the aforementioned health insurance products were tailored for low-income or informal sector workers. The lowest priced health insurance product, the EconoPlan product offered by MASM was, with a monthly premium per person at MWK 520 (2009)(~2.69 €)[498], high or even prohibitively priced for most middle and low-income earners in Malawi, although enrollment was open, in principle, to people working in the informal economy. The coverage ceiling for EconoPlan was 24-times the premium level and included treatment at public, CHAM and specified private clinics.[499]

In a study on private health insurance among formal sector workers in Malawi, Makoka et al. (2007) found out that formal sector employees tended to seek health care from private health care providers, a sector which has been fast growing and perceived to deliver better quality. Furthermore, they found that income was a significant predic-

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Malawi. In: Health Research Policy and Systems, vol. 11, p. 2 and 7f.

[495] McIntyre, Diane; Ranson, Michael Kent; Bhupinder, K Aulakh; et al. (2013): Promoting universal financial protection: evidence from seven low- and middle-income countries on factors facilitating or hindering progress. In: Health Research Policy and Systems, vol. 11, nr. 36, p. 4 and 8.

[496] cp. Makoka, Donald; Kaluwa, Ben; Kambewa, Patrick (2007): The Demand for Private Health Insurance in Malawi. In: University of Malawi, Economics Department Working Paper, vol. 2, p. 3268f.; Phiri et al. (2012): Willingness to Pay for Micro Health Insurance in Malawi, p. 289f.

[497] Maseko (2010): Social Health Insurance in Malawi. Draft Version 1.2, p. 41.

[498] Average exchange rate for year 2009 from OANDA Corp. (http://www.oanda.com) Malawi 1 EUR = 193.212 MWK.

[499] Pro MHI Africa (2009): Micro Health Insurance Mapping Exercise, Malawi.

tor of holding a private health insurance policy in Malawi.[500] Hence, rural and informal sector economy households, which account for the majority of Malawians have effectively had no access to health insurance.

Studies have also shown that access to publicly provided health care services is not fully equitable. For example, Zere et al. (2007) analyzed equity trends in health status and health care utilization in Malawi and argued that pro-rich inequities in health status and health care utilization "are widespread in Malawi and in some cases are widening despite concerted efforts of government and its development partners"; they concluded that poor households benefited less from publicly provided services than non-poor households.[501] Maseko (2010) confirmed inequities in access to publicly financed health care services and indicated lower health care utilization patterns in rural areas and showed lower utilization patterns for child care and maternal care among the lowest wealth quintile.[502]

4.3.6.3. Comparison of health care financing indicators in Ghana and Malawi

As shown in the previous two sections on health care financing in Ghana and Malawi, the systems function quite differently. In comparison, table 9 shows selected indicators on health care financing patterns in Ghana in Malawi. Additional variables of health care provision are also shown in the table, such as staff and hospital bed availability as well as some selected variables concerning health system output.

In 2009, the total expenditure on health (THE) in Ghana (current US$ 56.1) was twice as much as in Malawi (current US$ 28.7). In relationship to the gross domestic product (GDP), the total expenditure on health was even relatively higher, with 8.3% in Malawi and 5.1% in Ghana. The THE comprises government and private expenditures on health. In Ghana, the share of government contribution (57.8%) was considerably lower than in Malawi (74.3%) and the private expenditure on health was higher, accordingly. Private expenditure included voluntary health insurance schemes, with no government control and payments by corporations and households (including out-of-pocket payments).

In 2009, despite the existence of the NHIS, Ghana still showed high levels of out-of-pocket payments, accounting for 66.6% of private expenditure on health and relatively large 28.1% of THE. In monetary terms, out-of-pocket payments per capita in Ghana

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[500] Makoka, Donald; Kaluwa, Ben; Kambewa, Patrick (2007): Demand for Private Health Insurance Where Public Health Services are Free. The Case of Malawi. In: Journal of Applied Sciences, vol. 7, nr. 21, p. 3273.

[501] Zere et al. (2007): Equity in health and healthcare in Malawi, p. 12.

[502] Maseko (2010): Social Health Insurance in Malawi. Draft Version 1.2, p. 13f.

amounted to current US$ 15.8.[503] In comparison, out-of-pocket payments in Malawi were relatively lower, at 53.5% of private expenditure, which accounted for 13.7% of THE – due to the relatively lower private expenditures on health. Out-of-pocket payments per capita amounted to current US$ 3.9.[504] In Malawi, the positive trend concerning out-of-pocket payments, a significant drop in the share of out-of-pocket payments from 26% of THE in 1998 to 9% in 2006, has been reversed in recent years, so that the out-of-pocket rate reached levels between 13% (2007) and 16% (2007).[505]

As already indicated in section 4.3.6.2, private health insurance had a relatively small outreach in Malawi. Out of private expenditure on health, which was at 25.7% in Malawi, private health insurance schemes (private prepaid plans) accounted for only 15.9% of private expenditure, and accounted for only 4.1% of THE. In Ghana, after the inception of the NHIS, the importance of private health insurance in Ghana has substantially decreased. While the share of prepaid plans of private expenditure on health was constantly between 10-11% (1995-2005), the share fell to 6-7% from 2006 onwards. A similar pattern showed the share of prepaid plans in relation to THE, which fell from a range of 4.0-5.6% before 2005, to 2.4-2.7% between 2007 and 2009.[506]

A look at the share of external resources of the THE marked a significant difference in the health care financing systems of Ghana and Malawi. As external resources can either be channeled via government expenditure on health or via private expenditure on health, this figure could easily be assigned to either. While the share of external resources of the THE accounted for 13.1% in Ghana, the share of external resources showed the dependency of Malawi's health sector on international organizations and donors: In 2009, 80.2% of THE in Malawi were contributed from outside the country. Since 1995, the dependency of the Malawian health sector on external resources increased substantially: While the annual average of external resources out of THE was still 34.6% in the years 1995-1999, it increased to 56.4% in 2000-2004 and finally to 76.9% in the years 2005-2009.[507] This substantial increase was partially an effect of the economic situation in Malawi, but also due to the burden of the HIV/AIDS pandemic. The Global Fund to fight HIV/AIDS, which was also channeled via the SwAP in

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[503] World Health Organization (2014): National Health Accounts (NHA) indicators. Global Health Expenditure Database. URL: http://apps.who.int/nha/database/ViewData/Indicators/en (accessed 2014/08/19).

[504] Ibid.

[505] Zere et al. (2010): Health Financing in Malawi. Evidence from National Health Accounts, p. 7; World Health Organization (2014): Malawi - National Expenditure on Health (Malawian Kwacha).

[506] World Health Organization (2014): Ghana - National Expenditure on Health (Ghana Cedi). URL: http://apps.who.int/nha/database/Key_Indicators_by_Country/Index/en (accessed 2014/08/19).

[507] World Health Organization (2014): Malawi - National Expenditure on Health (Malawian Kwacha).

Malawi, caused a significant increase in these external resources.[508] In comparison, Ghana was able to reverse an increase in dependency on health care financing from external resources: The share of external resources of the THE tended to increase (with some annual fluctuations) from 7.3% in 1995 to 23.6% in 2005, the highest percentage. After 2005, coinciding with the introduction of the NHIS, the share of external resources significantly decreased to 17.9% in 2006 and 13.0% in 2007.[509]

The health care financing system in Malawi is based on tax- and donor-financed provision of health care services and, therefore, these sources accounted for 100% of general government expenditure. The NHIS in Ghana, classified as social security expenditure, accounted for 26.0% of general government expenditure on health in 2009. The NHIS increasingly became a major funding source for the health sector in Ghana.[510] Overall, 15.0% of THE was channeled through the NHIS.[511] However, the contributions by the informal sector to the NHIS only accounted for 0.57% of THE; in the system of National Health Accounts, these contributions were considered part of government expenditure, because the NHIS was considered to be a mandatory system, although this was only the case for formal sector members. For informal sector members, it is a de facto voluntary scheme, although the National Health Insurance Act aims for compulsory membership.[512]

Tab. 9: Selected indicators on health care financing, health care provision and health system outputs, Ghana and Malawi

Indicators	Ghana	Malawi
Per capita total expenditure on health (current US$)[4]	56.1	28.7
Total expenditure on health (THE) as a percentage of GDP[4]	5.1	8.3
General government expenditure on health as a percentage of THE[4]	57.8	74.3
Private expenditure on health as a percentage of THE[4]	42.2	25.7
External resources for health as a percentage of THE[4]	13.1	80.2
Private prepaid plans as a percentage of private expenditure on health[4]	6.3	15.9
Out-of-pocket expenditure as a percentage of private expenditure on health[4]	66.6	53.5

[508] Averages of five-year periods are given, because the annual percentages show a significant variation. Ibid.; Munthali, Spy; Ilsen, Dietmar (2012): The Potential of Micro Health Insurance in Malawi. In: Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (eds.): Handbook of Micro Health Insurance in Africa, 1. Lit Verlag. Berlin [a.o.], p. 130.

[509] World Health Organization (2014): Ghana - National Expenditure on Health (Ghana Cedi).

[510] In the WHO National Health Accounts, the NHIS was listed for the first time in 2005 as social security system and accounted for 21.7%. World Health Organization (no date): WHO Country Cooperation Strategy 2008-2011 Ghana. Brazzaville, p. 8. URL: http://www.afro.who.int/en/ghana/country-cooperation-strategy.html (accessed 2014/08/19).

[511] World Health Organization (2014): National Health Accounts (NHA) indicators. Global Health Expenditure Database.

[512] Government of Ghana (2003): National Health Insurance Act, p. Art. 31.

Social security expenditure on health as a percentage of general government expenditure on health[4]	26.0	0
Physicians (per 1,000 population)[3]	0.09	0.02
Nurses and midwives (per 1,000 pop.)[3]	1.05	0.34
Pharmaceutical personnel density (per 1000 pop.)[3]	[a]0.071	[a]0.021
Laboratory health workers density (per 1000 pop.)[3]	[a]0.012	0.040
Environmental and public health workers density (per 1000 pop.)[3]	[a]0.001	0.030
Community and traditional health workers (per 1,000 pop.)[3]	[a]0.192	[a]0.732
Health management & support workers density (per 1000 pop.)[3]	[a]0.011	[a]0.248
Other health workers density (per 1000 pop.)[3]	[a]0.026	0.138
Hospital beds (per 1,000 pop.)[1]	0.93	[c]1.30
Children with fever receiving antimalarial drugs (% of children < 5 with fever)[1]	[b]52.6	[b]43.4
Births attended by skilled health personnel (%)[2]	[a]54.7	[b]71.3
Antiretroviral therapy coverage (% of people with advanced HIV infection)[1]	28	40
Immunization, DPT (% of children ages 12-23 months)[1]	94	93
Immunization, measles (% of children ages 12-23 months)[1]	93	92

Notes: Data are from year 2009 if not indicated otherwise. a=2008, b=2010, c=2011
Sources: 1= The World Bank Data, 2=World Health Organization Global Health Observatory Data
Repository, 3=World Health Organization Health Workforce, 4=World Health Organization, National
Health Accounts Indicators. [513]

The figures in table 9 confirmed a severe shortage of health care professionals in Malawi, a problem which was already addressed in section 4.3.6.2. Highly skilled health staff in Malawi are rare and international migration of health professionals, the so-called 'medical brain-drain', has exacerbated the Malawian situation.[514] In Malawi, there were – per 100 000 population – only two physicians, 34 nurses or midwives, 2.1 pharmaceutical staff and 4 laboratory workers. In Ghana, which did not excel in international comparison concerning health staff availability, highly skilled staff was more widely available than in Malawi, as there were 9 physicians, 105 nurses or midwives, 7.1 pharmaceutical staff and 1.2 laboratory workers, per 100 000 population. Due to the lack of highly skilled health professionals, Malawi employed relatively more low-skilled staff compared to Ghana (see table 9). With regard to the availability of hospital

[513] The World Bank (2014): Data Ghana; The World Bank (2014): Data Malawi; World Health Organization (WHO) (2014): World Health Statistics. Health Workforce. Data by country. URL: http://apps.who.int/gho/data/node.main.A1444?lang=en (accessed 2014/05/25); World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics; World Health Organization (2014): National Health Accounts (NHA) indicators. Global Health Expenditure Database.

[514] Record et al. (2006): An Economic Perspective on Malawi's Medical 'Brain Drain', p. 6f.; Muula et al. (2006): How Are Health Professionals Earning Their Living in Malawi?, p. 1f.

beds, an indicator for the health infrastructure, Malawi provided 1.30 hospital beds per 1000 population, which was more than Ghana, with 0.93 per 1000.

5. Methods

5.1. Background of the study

The empirical data used for this study were generated by the project "Pro MHI Africa – EU-African University Network to strengthen community-based micro health insurance"[515] (2008-2010), which was funded by the ACP-EU Cooperation Programme in Higher Education (EDULINK), a program implemented by the ACP Group of States, with the financial assistance of the European Union. The aim of the international university consortium between the University of Cologne, the University of Botswana, University of Ghana and University of Malawi, was to build capacities in micro health insurance. The project was coordinated by the Department for Cooperative Studies of the University of Cologne.

The university network aimed to improve the institutional, academic and research capacity of the partnering universities, for the development of effective social health-related programs and to strengthen community-based micro health insurance. For this, the team members conducted research on health care financing of low-income households in the partner countries, developed an evidence-based microinsurance curriculum for university students and training modules for micro health insurance units and communities, and published the Handbook of Micro Health Insurance in Africa.[516] An integral part of the project was close cooperation with two community-based health financing organizations in research and capacity development in each country.

The project included a significant research component on health care financing, health risks, and health risk management of low-income households with a particular focus on micro health insurance. The essential part of the research component was a quantitative cross-sectional household survey in the three participating African coun-

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[515] Pro-MHI-Africa project website: http://www.microhealthinsurance-africa.org
[516] Rösner, Hans-Jürgen; Leppert, Gerald; Degens, Philipp; et al. (2012): Handbook of Micro Health Insurance in Africa. LIT Verlag. Berlin.

tries.[517] In Ghana and Malawi, which are subject of this study, the household survey was conducted between the 8th of March and the 5th of May 2009.

5.2. Household survey

5.2.1. Study setting and partner organizations

In Ghana and Malawi, the household survey was carried out in four regions, which coincided with the catchment areas of the four local partner organizations. The partner organizations, one in each region, were selected using a complex mapping exercise conducted by the research team. Potential partner organizations were community-based health financing organizations, such as micro health insurance schemes, pre-paid plans, health banks or drug funds, other risk management institutions, such as microfinance institutions, which aimed to provide access to risk management strategies, such as credit, emergency-credit, savings, credit-life insurance, life-insurance or funeral insurance, to low-income populations, mostly in the informal sector. Finally, the project partnered with two microfinance institutions in Malawi (Malawi Union of Savings and Credit Cooperatives (MUSCCO) and the Foundation for International Community Assistance (FINCA)) and two district-wide mutual health insurance schemes in Ghana (Hewaminami Kpe Mutual Health Insurance Scheme (Dangme West DMHIS) and West Gonja Mutual Health Insurance Scheme (West Gonja DMHIS)).

In Ghana, partner organization West Gonja DMHIS was located in the district West Gonja in the Northern region of Ghana and the Dangme West DMHIS in the district Dangme West in the Greater Accra region in the South of Ghana. Both institutions had a long history as community-based micro health insurance schemes and were integrated in the Ghana-wide NHIS after 2003.

The Dangme West (Dangbe West)[518] district is part of the Greater Accra region in the South of Ghana, with the district capital Dodowa. The region spans over 1442 square kilometers and is the largest district in the Greater Accra region. In the North-East, it is connected to the Volta river and in the South to the Atlantic Ocean.[519] The

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[517] It was decided to compare for this study Ghana and Malawi. Botswana was excluded for several reasons. First, it is a middle-income country with significant income from natural resources. The country is able to provide a free health care system on a relatively high level. Furthermore, due to difficulties in the sampling process in Botswana, the local team decided to follow a snowball sampling strategy. Due to this methodological difference, the data were not directly comparable to the other two countries.

[518] The district had just recently been renamed to Shai Osudoku District.

[519] Ghana Districts (no date): Ghana » Greater Accra Region » Dangme West. URL: http://dangmewest.ghanadistricts.gov.gh/ (accessed 2014/04/16).

population size of Dangme West district was 122 836 (2010).[520] It is a rural district with the main occupations of farming, fishing in the Volta river and the ocean as well as trading. The Dangme Hewaminami Kpe (DHK), translated as "A good health association" in English, started as a mutual health insurance scheme in 2000. The scheme was designed as a district mutual health insurance scheme by the Health Research Unit of the Ministry of Health of Ghana and the London School of Hygiene and Tropical Medicine, with the financial support of the European Union and DANIDA. It served as a community-based pilot scheme for the nationwide NHIS, introduced later.[521] The scheme joined the NHIS in 2005, as one of the DMHIS. Until the end of 2008, the membership was around 40 000 members.

The West Gonja district in the Northern region of Ghana spans over 8352 square kilometers, out of which 3800 square kilometers are occupied by the Mole National Park and Kenikeni Forest Reserves.[522] The district capital is Damongo. The population of West Gonja district was 84 727 (2010).[523] It is a rural district with farming and foresting. The West Gonja community financing health insurance scheme in Damongo, which later was called West Gonja Mutual Health Insurance Scheme, started operations in January 1996. The catholic church, which runs the mission hospital "West Gonja Hospital" in Damongo, initiated the health insurance scheme to improve access to health care and to reduce the financial burden of treatment for the target population mostly poor and rural households. Additionally, the catholic church sought to stabilize income flows from the health care services provided by the hospital. Hence, the original benefit package included mostly inpatient services provided at the West Gonja Hospital. The scheme joined the NHIS after its inception. At the end of 2008, the scheme had around 50 500 members, about 50% of the target population.

In Malawi, the project partnered with two community-based microfinance institutions. MUSCCO was located in the Central region of Malawi and FINCA Malawi in the Southern region of Malawi. Both institutions provided credit and savings products to their members, as well as credit-life insurance and emergency loans. MUSCCO also provided a life-savings product.

The Malawi Union of Savings and Credit Cooperatives (MUSCCO), founded in 1980, was the umbrella organization for 57 Savings and Credit Cooperatives (SACCOs) in

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[520] Ghana statistical service (2010): 2010 Population and Housing Census for all districts, p. 4. URL: http://www.ghanadistricts.com/home/?_=83&sa=7060 (accessed 2013/03/04).
[521] Atim et al. (2001): A Survey of Health Financing Schemes in Ghana, p. 53.
[522] Ghana Districts (no date): Ghana » Northern Region » West Gonja District. URL: http://westgonja.ghanadistricts.gov.gh/ (accessed 2014/04/16).
[523] Ghana statistical service (2010): 2010 Population and Housing Census for all districts, p. 9.

Malawi, with a membership of about 55 000 members.[524] MUSCCO's headquarter was in Lilongwe, Central region, but the Savings and Credit Cooperatives operated in all regions of Malawi and provided microsavings, microcredit, credit-life insurance and a life-savings product. Loans were given on an individual basis or in group-based lending systems (in the Southern region).

The Foundation for International Assistance (FINCA) was an international NGO that operated as a microfinance institution in Malawi. The head quarter was in Blantyre, Southern region of Malawi and the Southern region was also the focus of operations. FINCA provided microcredit, microsavings and credit-life insurance, mostly via so-called village banks, a group-based lending system.

5.2.2. Scope and structure of the survey

The household survey was designed to allow for country comparisons (see section 5.2.3 on the sampling strategy). The questionnaire (Appendix 5) was designed in cooperation with the project's country teams and consisted of sections that were identical in all countries and were, therefore, comparable; additionally there were optional country-specific sections.[525] The standardized questionnaire consisted of 26 pages and was divided into ten sections. It was administered to the heads of household. The questionnaire followed a two-stage design collecting household-level information and individual-level information. Several sections and item blocks were collected with information on all individuals in the household, such as basic individual information in the household roster (questionnaire section 0). The core part of the questionnaire collecting information on individual level were the sections on health care utilization (questionnaire section 2), an extensive section on utilization and spending on health care applying the method of illness episodes (recall period 3 months), a section on hospitalization events (recall period 24 months), a section on maternity events (recall period 5 years) and a section on chronic and permanent illnesses (recall period 12 months).

The part of the questionnaire collecting information on household level consisted of a section on the general availability of health care providers (questionnaire section 1), on health insurance membership and spending (questionnaire section 3), on non-health-related household expenditure (questionnaire section 4), a section on member-

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[524] Membership figures from 2004. Enarsson, Sven; Wirén, Kjell (2005): MUSCCO - Malawi Union of Savings and Credit Cooperations. CGAP Working Group on Microinsurance. Malawi, p. iv and 5. URL: http://www.microinsurancenetwork.org/publication/fichier/_MUSCCO_Case_Study_8.pdf (accessed 2011/10/27).

[525] Exceptions were currencies, and household roster information on membership in the partner organizations and questions on the educational level.

ship in community associations (questionnaire section 5), a section on attitudes and trust in the community, organizations and authorities (questionnaire section 6), a section on general risks and risk aversion (questionnaire section 8) and a section on household income and sources (questionnaire section 9). This section also contained questions on household and productive assets in order to be able to create a wealth index and wealth quintiles for the households.

As discussed in section 3.4, and presented in table 2 on page 60, a variety of SRM strategies exist in the context of low-income households in Malawi and Ghana. A variety of SRM strategies, as well as household risk exposure to general risks, and individual exposure to health risks could have been extracted from the household survey data. Several sub-sections of the questionnaire contained relevant information. The questionnaire section 8 on "Risk and risk aversion" captured information on household level of exposure to general risks in the last three years and how it impacted the household. The section on health care utilization contained information on individual-level health risk exposure. On household level, information was collected on membership in community organizations, community-groups and support networks and related activity levels. The household roster collected information on membership in the partner organizations and health insurance schemes on individual level and questionnaire section 3 on household-level membership and spending on health insurance. Information on asset-accumulation strategies could be extracted from the static wealth status based on asset possession. All health care utilization sections contained detailed parts on how the household/individual managed to pay for direct and indirect health care costs with information on the used SRM strategies.

Another focus of the survey was household health insurance membership, consisting of a section on health insurance membership and spending, as well as membership in the local partner organizations, a sub-section on the membership in the Ghanaian NHIS (Ghana-specific section) and a section measuring Willingness to Pay (WTP) for health insurance. The section on WTP used an elaborated strategy to elicit the willingness to pay of the head of household following the contingent valuation method using a bidding game. In contingent valuation, individuals are directly asked, in a hypothetical survey, what the maximum amount is that they are willing to pay for a certain product.[526] Out of the different methodologies of contingent valuation, the bidding game approach was chosen over the take-it-or-leave-it (TIOLI) approach, as there are

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[526] cp. Olsen, Jan Abel; Smith, Richard D. (2001): Theory versus Practice. A Review of 'Willingness-to-Pay' in Health and Health Care. In: Health Economics, vol. 10, nr. 1, p. 40.

indications that this approach leads to more reliable outcomes.[527] However, the bidding game approach is prone to a starting point bias;[528] therefore, a payment card approach was used in order to elicit a variable starting price (the WTP of the individual respondent) for the bidding game (the WTP for the household member to be insured). The payment card visually showed 12 increasing monetary values in the local currency, which assisted the respondent in his/her decision on an individual willingness to pay for the hypothetical health insurance product (see Appendix 8).[529] The value selected from the payment card, multiplied by the number of family members he/she is willing to insure, served as a starting price for the subsequent bidding game in order to avoid a starting point bias.

The respondent was asked whether he/she was willing to accept the amount of the first bid (the calculated starting point). If the respondent agreed, the interviewer iteratively increased the value in small steps until the respondent disagreed to the mentioned value. This highest bid was taken as the maximum willingness to pay of the household. In case the respondent disagreed to the calculated starting point value, the interviewer iteratively reduced the value by small steps until the respondent agreed to the value for the first time. Again, the result served as the maximum willingness to pay of the household for the potential micro health insurance product.

5.2.3. Household sampling strategy and data collection

The internationally comparative household survey applied a three-stage sampling strategy. The first was the distribution of the sample between the countries, based on feasibility calculations by the local partner universities, University of Ghana and University of Malawi, on the basis of equal budgets for each university. The second stage consisted of the even distribution of the overall sample to two distant research sites in each country. The catchment areas of the four community-based partner organizations in Ghana and Malawi defined the research sites for the household survey. In a third stage, half of the households were randomly selected on the basis of the partner institutions' membership registers. For the other half of the households, the non-member

[527] Dong et al. (2003) analyzed the test-retest reliability of both approaches in rural Burkina Faso. Dong, Hengjin; Kouyate, Bocar; Cairns, John; et al. (2003): A Comparison of the Reliability of the Take-It-or-Leave-It and the Bidding Game Approaches to Estimating Willingness-to-Pay in a Rural Population in West Africa. In: Social Science and Medicine, vol. 56, nr. 10, p. 2187.

[528] Dong, Hengjin; Kouyate, Bocar; Cairns, John; et al. (2003): Willingness-to-Pay for Community-Based Insurance in Burkina Faso. In: Health Economics, vol. 12, nr. 10, p. 858.

[529] O'Brien, Bernie; Gafni, Amiram (1996): When Do the 'Dollars' Make Sense? Toward a Conceptual Framework for Contingent Valuation Studies in Health Care. In: Medical Decision Making, vol. 16, nr. 3, p. 297.

households closest to households selected from the membership list in the same village, served as control households.

The household selection was handled slightly differently in Ghana and Malawi, because the partner organizations in Ghana had difficulties providing accurate and up-to-date membership lists. Therefore, it was decided that the selection mode in Ghana was a random selection of villages and communities within the catchment area of the organization. In a second step, the field coordinators consulted the local village/community volunteer for the district-wide mutual health insurance scheme in the village and then, based on village-wide membership lists, randomly selected members of the partner institution as respondents. Like in Malawi, the non-member household closest to the respondent member-households in the same village served as a control household. The Northern region in Ghana deviated from the other three regions. Due to the community-based character and the longer history of the West Gonja scheme, some villages were found to have very high outreach levels of the DMHIS, so that it was not possible to retrieve sufficient non-member households as direct controls in the sampled villages. In the study area in the Northern region, there were long distances between villages, so large inter-village variations were expected. For this reason, and to avoid distortions through an adjustment of the sampling strategy in one research site only, which would lead to difficulties in the comparability to the other research sites, it was decided to maintain the same sampling strategy in Northern Ghana. The side effect of this strategy was an accepted deviation from the member/control quota, due to the unavailability of sufficient control households in these villages. Hence, it was decided that in the case that no close non-member households existed, the interviews were continued with the closest member households, who were not previously interviewed. Therefore, the actual sample in the Northern region diverted from the applied quota rule, but fulfilled the criteria of a comparable number of successful household interviews between the regions.

Overall, 1428 households were successfully interviewed with complete data sets, 600 households in Ghana and 828 households in Malawi. In total, 793 households (55.53%) who were members of a partner organization and 635 control households (44.48%) were successfully interviewed. Table 10 gives an overview of the sample by country and region.

Tab. 10: Sample size by country and region

Catchment area	Ghana (N=600)		Malawi (N=828)	
	Dangme West DMHIS	West Gonja DMHIS	MUSCCO	FINCA
Region	Greater Accra region (South)	Northern region	Central region	Southern region
Sample size	301	299	387	441
Quota rule: Member household vs. control households	50%/50%	50%/50%	50%/50%	50%/50%
Actual sample: Member households vs. control households	154 (51.2%) / 147 (48.8%)	252 (84.3%) / 47 (15.7%)	172 (44.4%) / 215 (55.6%)	215 (48.8%) / 226 (51.3%)

Source: author

The partner universities oversaw the field implementation of the household survey and the recruitment of interviewers for the face to face interviews. The field coordinators were research assistants at the partner universities permanently working on the Pro MHI Africa project. Several mechanisms were applied to ensure high data quality and comparability of the data between the countries: the jointly discussed and developed highly standardized questionnaire, digital data entry tools, clear instructions for interviewers and supervisors, methodology workshops for the local research teams, and intensive interviewer trainings and pre-tests in each country. The interviews were administered using pen and paper. Double data entry took place at the local partner institutions using the data entry tool CSPro 4.0.[530] After that, the data were cleaned and the different data sets merged. Data cleaning and data analysis was done using the statistical software Stata 13.1.[531]

5.3. Statistical methods used in analysis

This study applied a variety of univariate, bivariate and multivariate statistical techniques, in order to test the hypotheses. For comparisons of different groups of a variable, the arithmetic mean was used and, if the distribution of the variable required it, the median or the α-trimmed mean (α=0.05) was additionally calculated. In the 0.05-trimmed mean, the lowest and the highest 5% cases of a variable were dropped and the arithmetic mean of the remaining cases was calculated. As discussed in the section

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[530] U.S. Census Bureau (no date): CSPro. URL: http://www.cspro.org/cspro/software/start.cfm?dest=1.
[531] StataCorp (2013): Stata Statistical Software.

2.4.1 on health care costs, the median and the trimmed mean are more appropriate measures if the distribution of a variable does not follow a normal standard distribution. The median is represented by the 0.5 percentile, which is the value of the case that splits all cases in half, if sorted from lowest to highest case. Therefore, percentiles are robust against outliers at the top of the distribution. The α-trimmed mean ignores outliers at the top and bottom of the distribution and is, therefore, robust for any outliers on both ends.[532] Both measures are more suitable than the arithmetic mean for a distribution highly right-skewed with a long right tail, which is the case, for example, in health care costs and income.[533] In the case of health care costs, the concentration curve and the Gini disparity coefficient was calculated to illustrate that health care costs are concentrated among a small share of individuals.[534] In analysis, means and distributions of different sub-categories of a variable were compared.

Several bivariate statistical methods were applied. In cross tabulations of two variables, the Pearson χ^2-test of independence was used to measure whether the two variables (or two groups of one variable) were independent and whether the distributions of the groups significantly differed.[535] To measure the strength of relationship, different measures were applied, depending on the level of measurement of the variables, notably Φ, τ_b, and r.[536] The measures of association Φ was calculated for the case of two dichotomous variables, in order to measure the strength of relationship.[537] If one variable could be identified as a dependent variable, the odds ratio of the bivariate logistic regression was estimated and interpreted. For multiple groups of ordered categorical

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[532] Wilcox (2010): Fundamentals of Modern Statistical Methods - Substantially Improving Power and Accuracy, p. 131ff. and 156f.

[533] cp. Cleff, Thomas (2015): Deskriptive Statistik und moderne Datenanalyse, 2 edition. Gabler. Wiesbaden, p. 66.

[534] Bomsdorf, Eckart (1999): Deskriptive Statistik. WISO Studientexte 1, 10 edition. Josef Eul Verlag GmbH. Lohmar, p. 69 and 74ff.; Toutenburg, Helge; Heumann, Christian (2006): Deskriptive Statistik: Eine Einführung in Methoden und Anwendungen mit SPSS, 5 edition. Springer. Berlin [a.o.], p. 89ff.

[535] Bortz, Jürgen; Schuster, Christof (2010): Statistik für Human- und Sozialwissenschaftler, 7 edition. Springer-Lehrbuch. Berlin [a.o.], p. 137ff.; Acock, Alan C. (2012): A Gentle Introduction to Stata, 3 (revised) edition. Stata Press. College Station, TX, p. 123d.; Kühnel, Steffen-M.; Krebs, Dagmar (2004): Statistik für die Sozialwissenschaften: Grundlagen, Methoden, Anwendungen, 2 edition. Rowohlt Tb. Reinbek bei Hamburg, p. 335.

[536] cp. Pett, Marjorie A. (1997): Nonparametric statistics in health care research. SAGE. Thousand Oaks [a.o.], p. 274; Cleff (2015): Deskriptive Statistik und moderne Datenanalyse, p. 80.

[537] Acock (2012): A Gentle Introduction to Stata, p. 129; Chen, Peter Y.; Popovich, Paula M. (2002): Correlation. Parametric and nonparametric measures. Sage. Thousand Oaks [a.o.], p. 29ff.; Pett (1997): Nonparametric statistics in health care research, p. 226ff.

variables, the measure tau-b (τ_b) was used.[538] For two continuous variables, the Pearson correlation coefficient *r* was calculated to measure the strength of relationship.[539]

T-tests were applied in order to test whether the means of a continuous variable between the two different categories of a grouping variable differed significantly. Although commonly applied, the t-test has several critical assumptions, such as equal variances in both categories and normality of the variable in both categories. Furthermore, the t-test is less accurate if these assumptions are violated and also if the sample sizes of the categories strongly differ.[540] For example, such a critical case occurs in health care research using household survey data, by comparing the means of a variable of interest between individuals who have a certain illness and those (the majority) who do not.[541] In addition, for variables which violated the assumptions of the t-test, the non-parametric Kolmogorov-Smirnov two-sample test was calculated, which compares the distribution of a continuous variable in the two levels of the categorical variable and which has fewer assumptions on the underlying variable than the t-test; the Kolmogorov-Smirnov test is particularly reliable when one or both samples are small.[542]

For more than two categories of a continuous variable, analysis of variance (ANOVA) was applied. In order to test whether there was a significant difference between a set of means in the categories of the variable, multiple-comparison tests were used applying the Bonferroni correction.[543] Generally, ANOVA models have assumptions similar to the t-test, such as equal variances and normality assumptions, and are

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[538] Acock (2012): A Gentle Introduction to Stata, p. 134ff.; Chen et al. (2002): Correlation. Parametric and nonparametric measures, p. 84ff.

[539] Kühnel et al. (2004): Statistik für die Sozialwissenschaften, p. 401ff.; Kohler, Ulrich; Kreuter, Frauke (2008): Datenanalyse mit Stata: Allgemeine Konzepte der Datenanalyse und ihre praktische Anwendung, 3 edition. Oldenbourg Wissenschaftsverlag. München, p. 187; Chen et al. (2002): Correlation. Parametric and nonparametric measures, p. 9.

[540] Bortz, Jürgen; Lienert, Gustav A; Boehnke, Klaus (2008): Verteilungsfreie Methoden in der Biostatistik. Springer. Heidelberg, p. 122.

[541] cp. Pett (1997): Nonparametric statistics in health care research, p. 28f.

[542] Ibid., p. 87ff.; on the use of non-parametric tests if assumptions of t-test are violated: Bortz et al. (2008): Verteilungsfreie Methoden in der Biostatistik, p. 130; since the Kolmogorov-Smirnov-test has been chosen over the Mann-Whitney U-test, as it is more reliable if the categories contain small sample(s): Pett (1997): Nonparametric statistics in health care research, p. 93; Bortz et al. (2010): Statistik für Human- und Sozialwissenschaftler, p. 305.

[543] The Bonferroni multiple-comparison test is a reliable, but conservative measure, to be used for a 'small number of simultaneous tests (up to five)'; for a larger number of tests, for example Scheffé"s test would be preferrable (which may be less sensitive): Everitt, Brian; Skrondal, Anders (2010): The Cambridge dictionary of statistics. Cambridge University Press. Cambridge [a.o.], p. 59.; Hamilton, Lawrence C (2012): Statistics with Stata. Duxbury/Thomson Learning. Belmont, CA [a.o.], p. 153; Acock (2012): A Gentle Introduction to Stata, pp. 209–214; Stata Press (ed.) (2013): Stata user's guide release 13. Stata Press. College Station, TX, p. 1548.

sensitive to distributions that contain outliers. Hence, the Kruskall-Wallis test, a non-parametric alternative to ANOVA, was additionally presented, if these assumptions were violated.[544] As measure of effect size of the grouping variable on the dependent variable, Cohen's d (δ) was calculated and presented.[545]

Several multivariate regression models were estimated. When the dependent variable was dichotomous, which was the case, for example, with chronic conditions and long hospitalization stays, multivariate logistic regressions were applied, using the maximum likelihood estimation with b coefficients. B coefficients are used to standardize the effects of the variables in regression models, showing how much a one unit change in the independent variable increases or decreases the predicted log odds of the dependent variable.[546] In order to compare the importance of factors on the dependent variable, transformed, standardized coefficients were calculated that present the percent changes in the odds of the dependent variable, if the independent variable changes by one unit or alternatively by one standard deviation.[547] As a measure of the degree of explained variance, the adjusted McFadden Pseuso-R^2 (likelihood-ratio index) was calculated. The Count-R^2 was additionally provided, a common measure that gives the share of correctly predicted values.[548]

In cases when the dependent variable was continuous (metric), multivariate linear ordinary-least-square (OLS) regressions were estimated. For OLS regressions, the adjusted R^2 was reported, which is the degree to which the regression model explains the variance in the dependent variable. Compared to the usual R^2, the adjusted R^2 is more reliable, as it considers the N and the number of parameters, particularly relevant for multiple linear regression models with many variables.[549] The Breusch-Pagan test was

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[544] Hamilton (2012): Statistics with Stata, p. 153f.; On the assumptions of ANOVA and the Kruskall-Wallis test: Acock (2012): A Gentle Introduction to Stata, p. 206 and 218f.

[545] Cohen's delta (contrary to omega^2) is not a measure of explained variance in the dependent variable, but rather considers the difference of the two means and the standard deviation (denominator). Acock (2012): A Gentle Introduction to Stata, Revised Third Edition, p. 166 and 171ff.; Wilcox (2010): Fundamentals of Modern Statistical Methods - Substantially Improving Power and Accuracy, p. 117f.

[546] For bivariate logistic regression, the odds ratios were estimated and interpreted. For multivariate models, the b-coefficients were estimated, because they allow comparisons between predictors. Acock (2012): A Gentle Introduction to Stata, p. 310; Kohler et al. (2008): Datenanalyse mit Stata, p. 273f.; Hamilton (2012): Statistics with Stata, p. 258ff.

[547] Long, J. Scott; Freese, Jeremy (2003): Regression models for categorical dependent variables using stata, Rev. ed. edition. Stata Press. College Station, TX, p. 73ff.; Acock (2012): A Gentle Introduction to Stata, p. 310ff.

[548] Kohler et al. (2008): Datenanalyse mit Stata, p. 280f.; Long et al. (2003): Regression models for categorical dependent variables using stata, p. 82 and 85f.

[549] Bortz et al. (2008): Verteilungsfreie Methoden in der Biostatistik, p. 192 and 347f.; Kohler et al. (2008): Datenanalyse mit Stata, p. 204f.

applied to measure the level of heteroscedasticity, and in order to reduce the level of heteroscedasticity, the Huber-White sandwich estimator was applied, which produces more robust regression coefficients than the standard OLS estimation.[550] In order to further reduce the level of heteroscedasticity, the natural logarithm of some dependent variables with high level of heteroscedasticity were calculated and used in the regression model, because it avoided problems with heteroscedasticity.[551] Centered variance inflation factors (VIFs) were calculated, in order to detect and avoid collinearity of variables.[552] If the independent variables in a multivariate regression model formed logical groups, they were step-wise included into the regression model, in order to evaluate the effects of the different factor groups.

For selected bivariate and multivariate linear models, the measure ω^2 was calculated, to estimate the effect sizes of different factors in linear models (OLS regression models and ANOVA calculations). Ω^2 can be seen as equivalent to the incremental increases in adjusted R^2 estimates and, therefore, is an estimator of the variance explained in the dependent variable.[553]

6. Analytical framework and hypotheses

6.1. Analytical framework and structure of analysis

As elaborated in detail in section 2.1 on risk characteristics, mutual interdependencies between social risk management strategies and risk characteristics (e.g. risk probability and risk exposure, the extent of shocks) can be expected. Section 3.3 provided more detail about how different SRM strategies may have different impacts on risk exposure, risk-related shocks and the impact of the shock on households (see figure 1 on page 45). Hence, SRM strategies either ex-ante reduce the probability of the risk or the extent of the shock; or they reduce ex-ante or ex-post the impact of the shock on households or individuals. As shown in the first part of the study (sections 2-4.3.6.3), both risk exposure and accessibility of SRM strategies are dependent on certain socio-eco-

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[550] Kühnel et al. (2004): Statistik für die Sozialwissenschaften, p. 427f.; Kohler et al. (2008): Datenanalyse mit Stata, p. 225f.; Baum, Christopher F (2006): An Introduction to Modern Econometrics Using Stata. Stata Press. College Station, TX, p. 145ff.; Fahrmeir, Ludwig; Kneib, Thomas; Lang, Stefan (2009): Regression: Modelle, Methoden und Anwendungen (Statistik und ihre Anwendungen), 2 edition. Springer. Heidelberg [a.o.], p. 131 and 135f.; Stata Press (ed.) (2013): Stata user's guide release 13, p. 309f.

[551] Kohler et al. (2008): Datenanalyse mit Stata, p. 238.

[552] Bortz et al. (2010): Statistik für Human- und Sozialwissenschaftler, p. 350f.; Acock (2012): A Gentle Introduction to Stata, p. 268f.

[553] Acock (2012): A Gentle Introduction to Stata, p. 231f.

nomic characteristics, such as the wealth of the household, the household size or the age of the individual. Socio-economic characteristics are not the only influence on the use of SRM strategies by households, previous risk experience and the perception of being exposed to higher risks than others are also relevant factors. For example, previ-

Fig. 4: Conceptual framework

Determinants
- Wealth
- Income   } Ability to
- Expenditure   } Pay (ATP)

- Education
- Insurance knowledge and experience
- Age of HoH / individual
- Sex of HoH / individual
- HH size
- Child/adult ratio

Risk exposure
- **HH level**
  - HH exposure to risks
  - HH exposure to illnesses
  - HH catastrophic spending on health
- **Individual level**
  - Exposure to short-term illnesses (status, illness episodes)
  - Exposure to long-term illnesses (chronic conditions, hosp.)
  - Classification as high-risk cases
  - Classification as high-cost cases

Social (health) risk management strategies (SRM)

General	Health incidents
1. Income / occupation diversification 2. Multiple income earners 3. Assets / wealth 4. Loans & Savings 5. Social activity levels (memberships, leadership) (SC)	• SRM strategies used for health care & health risks 　• Health insurance 　• Payment sources for health care • Payment sources based on social capital & other social assistance
• Insurance as element of SRM	• Willingness to pay (WTP)

Confounders
- Household environment
- Country and region
- Availability of health care providers
- Religion
- Risk aversion
- Marital status

Implications for SRM strategy 'health insurance'
Relationship of risk exposure, health insurance and application of SRM strategies

Health insurance

Risk exposure ◄ ▲ ► SRM strategies

Source: author

ous experiences with illness or with treatments that caused high health care costs influences household's health risk management strategies, because households prepare for potential future illnesses. Similarly, a household might be aware that individuals in the household carry a higher risk of falling sick compared to others. Both experiences with high costs and perceptions of high risk exposure influence households' risk management behavior. However, these motivating factors needed to be treated conceptually differently, as they were expected to have different effects on households' behavior with regard to ex-ante risk management strategies. In this study, these two different parts of the illness experience were conceptualized as *high-cost cases* and *high-risk cases*.

The analytical framework, as presented in figure 4, showed four main analytical parts, which demonstrated strong interdependencies (parts in the figure are discussed clockwise):

The first main part (top right in the figure) represented the variables on *risk exposure*. These were separated by households' and individual risk exposure to (a) general risks, (b) short-term and (c) long-term health risks. As introduced in section 2.4 on the dual economic burden of health risks, direct and indirect health care costs (particularly if considered catastrophic) are a substantial part of health risk exposure. On individual level, high-cost and high-risk individuals were defined on basis of cost data and their individual characteristics.

The second main analytical part represented the *social (health) risk management strategies (SRM)* applied by households to manage general risks and health risks. A variety of SRM strategies that were discussed in sections 4.2 and 4.3 were extracted from the dataset and operationalized, such as diversification in income and occupations, asset-holding, savings, credit, insurance, and social activity levels or community trust. Since health insurance was only widely available as an essential SRM strategy in Ghana, the willingness to pay for health insurance was calculated as a proxy for the need of health insurance as an SRM strategy. For this analytical part, it was decided not to use the concept of social capital. Some concepts are well-established constructs, such as trust, participation and social networks. The described phenomena were analyzed without subsuming it under the concept of social capital.[554] However, each of the observed phenomena were analyzed regarding its value for risk management and were operationalized using these constructs. In this sense, the concept of social capital inspired the analysis, by keeping the interchangeable nature of capital in mind, which was considered to be "convertible" between social, physical and cultural. Cognitive and structural views on social capital were also considered in the analysis.

The third main analytical part was the *implications for the SRM strategy 'health insurance'* (using actual health insurance membership and the proxy of willingness to pay for health insurance by households) representing the triangular relationship with high risk exposure and other SRM strategies. This analysis aimed to determine the suitability of health insurance as SRM strategy and whether it filled gaps in the existing sets of SRM strategies.

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[554] cp. Inaba, Yoji (2013): What's Wrong with Social Capital? Critiques from Social Science. In: Kawachi, Ichiro; Takao, Soshi; Subramanian, S.V. (eds.): Global Perspectives on Social Capital and Health. New York [a.o.], p. 326f.

The fourth analytical part (on the left side of the figure) represented the main socio-economic and personal *determinants,* as well as other *confounding variables.* These variables were used to measure the relationship with the three main conceptual parts.

First, each of the parts was descriptively presented and then their interrelations with the other analytical parts were described. The analysis followed eight steps along the conceptual framework. In the steps, important descriptive statistics and the distribution of the dependent variables were discussed along with determinants and confounders of the variables. An overview of the analysis structure is given in table 11, indicating the section, where the analytical parts were detailed.

Tab. 11: Structure and steps in analysis

Step	Method	Analytical parts			Section
0	General descriptives				7.1
1	Descriptives, distribution	Risk exposure (individual and household-level)			7.2&7.3
2	Bivar. analysis, multivar. regression	Risk exposure (individual and household-level)	↔	Determinants & confounders	7.2&7.3
3	Descriptives, distribution	Social risk management			7.4
4	Bivar. analysis, multivar. regression	Social risk management	↔	Determinants & confounders	7.4
5	Bivar. analysis, multivar. regression	Social risk management	↔	Risk exposure	7.4
6	Multivar. regression	Willingness to pay for health insurance	↔	Determinants & confounders	7.5
8	Multivar. regression	Health insurance membership	↔	Social risk management Risk exposure	7.5

Source: author

6.2. Hypotheses

Based on the literature review from chapter 2, 3 and 4, several hypotheses were developed following the research questions and the conceptual framework. The hypotheses were operationalized based on the available data and variables. With regard to general household exposure to risks, it was hypothesized that:

1	There is a significant relationship of socio-economic household characteristics and geographic factors with exposure of households to general risks

H_{1a}: Type and extent of general risk exposure show a significant geographic variation between countries, regions and between categories of household environment.

H_{1b}: The lowest wealth quintile and the lowest income quintile experience the highest general risk exposure.

H_{1c}: Higher educational level of the household reduces general risk exposure.

With regard to health care costs and health risks, it was hypothesized that:

2	The economic burden of disease is concentrated on a few individuals and households, while certain determinants increase the likelihood to face high health care costs.

H_{2a}: High acute health risk exposure of individuals can be partially explained by personal characteristics such as sex, old age or pre-existing medical conditions (e.g. chronic diseases or long hospitalization stays).

H_{2b}: Health care costs are heavily positively skewed so that the economic burden of disease severely hits a small percentage of individuals and households, so that less than 10% of individuals and households carry more than 50% of total health care costs.

H_{2c}: Households with health insurance are less likely to be in the high-cost group than uninsured households (Financial protection of health insurance)

H_{2d}: High-risk households have at least twice the likelihood to be in the high-cost group than low- or medium-risk households.

With regard to household sets of social risk management strategies, it was hypothesized that:

3	Households apply a wide array of risk management strategies which depend on socio-economic and geographic characteristics as well as high-risk status and high-cost exposure.

H_{3a}: Certain socio-economic characteristics (education, wealth, household size, age of head of household, religion) of the household as well as geographic characteristics (country, region) make a significant difference in the applied risk management strategies.

H_{3b}: High-risk exposure of households is related to higher complexity of sets of risk management strategies.

H$_{3c}$: High-risk exposure of households is related to higher application of those SRM strategies that can be considered pro-active strategies compared to other groups.

H$_{3d}$: High-cost households use more complex sets of SRM strategies than other households.

H$_{3e}$: High-cost households who are also high-risk households have a significantly different set of SRM strategies compared to other high-cost households.

With regard to the willingness to pay (WTP) for health insurance it was hypothesized that:

4   Higher risk exposure of households and higher socio-economic status are related to higher levels of WTP.

H$_{4a}$: Higher wealth and income levels result in a higher level of WTP (Ability to pay).

H$_{4b}$: Higher educational level and better understanding of insurance (awareness of insurance) result in a higher level of WTP.

H$_{4c}$: Higher household general (non-health) risk exposure leads to a higher level of WTP.

H$_{4d}$: High-risk households are related to a higher level of WTP.

H$_{4e}$: High-cost households (in the last three months) are not related to changes of WTP levels.

H$_{4f}$: The application of other SRM strategies is related to a reduced WTP level (crowding-out effect)

H$_{4g}$: Households in Ghana that have health insurance (NHIS) show a higher WTP than uninsured households.

With regard to health insurance as an SRM strategy it was hypothesized that:

5   Health insurance membership of households depends on risk exposure and the complexity of sets of SRM strategies.

H$_{5a}$: High (non-health) general risk exposure is positively related to health insurance membership.

H$_{5b}$: High-risk (health) households are more likely to have health insurance membership.

H$_{5c}$: High-cost households are negatively related to health insurance membership (financial protection of health insurance)

H$_{5d}$: The complexity of SRM strategy sets (without health insurance) is negatively associated with health insurance membership (crowding-out effect)

6.3. Operationalization of variables

All variables from the household survey questionnaire that were required for analysis were operationalized in order to match analytical constructs and the applied statistical models. This process included imputation of missing values and the creation of indices.

Some variables used in the regression models contained missing values. It was decided to impute these values for the independent variables where the assumption could be made that the missing values were missing at random or missing completely at random. There was no imputation done for the dependent variables, e.g. the level of willingness to pay, in order not to distort the results. The imputations were conducted using multiple regressions (based on OLS regression, ordinal regression and multinomial regression, respectively) with all relevant predictor variables. The imputations followed a five-step algorithm, as suggested by Buuren et al. (1999).[555]

Due to the application of different methodological approaches, variations of some variables were computed in order to match the requirements of a particular statistical model. This section describes the computation of the dependent variables in detail, as well as the calculation of some more complicated independent variables. Details are given for the dependent variables Willingness to Pay (WTP), high-cost household, and high-risk household, as well as the independent variables total household income and the wealth level of the household/socio-economic status (SES); for an overview see table 12. All independent variables used in analysis that did not require further description are described in table 13.

Tab. 12: Main (dependent) variables

Variables	Measurement
Household risk exposure	
High cost household (health)	0 = low or medium health care costs 1 = high health care costs (>1 standard deviation higher than the mean of the logarithm of total health care costs)
Household classified as high (health) risk household (4 categories)	0 = low health risks 0.33 = low to medium health risks 0.66 = medium to high health risks 1 = high health risks
Household classified as high (health) risk household (binary)	0 = low or medium health risks 1 = high health risks

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555 As implemented by the Stata command ado uvis/ice. See van Buuren, S.; Boshuizen, H. C.; Knook, D. L. (1999): Multiple Imputation of Missing Blood Pressure Covariates in Survival Analysis. In: Statistics in Medicine, vol. 18, nr. 6.

General risks exposure of household	Continuous/Count (0-11) or categories: 0 = No risk exposure 1 = 1-3 risks 2 = 4-6 risks 3 = more than 7 risks
Household exposure to non-health general risks with negative economic impact on household	Continuous/Count (0-11)
Social risk management strategies	
Complexity of SRM strategies	Continuous/Count (0-7)
Complexity of set of SRM strategies (without health insurance)	Continuous/Count (0-6)
Health insurance membership of household	0 = no household member is insured for health 1 = at least one household member insured for health
Willingness to pay per person in € (log)	Continuous
Willingness to pay per person in € (log), if willingness was expressed to purchase at final bid	Continuous

Source: author

The definition of *high cost households* was based on the total direct and indirect health care costs of all illness episodes that were reported by the household in the three month recall period.[556] In section 2.4.2, a few studies were mentioned that computed variables representing "high" or "highest" cost cases. All of these studies either used a monetary value threshold or a fix percentage (e.g. 10% of individuals counted from the most expensive individual) to define high cost individuals. These applied measures do neither acknowledge the distribution of the variable nor the distance from the mean. Hence, a calculation method that takes into account these two factors was sought. A typical method to identify extreme values of a normally distributed variable is measuring the values that are further than one standard deviation (SD) from the central point (mean). In a normal distribution, this is the inflection point of the curve. In the case of heavily positively skewed distributions, which is typically the case in illness costs, this

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[556] Direct costs included: allopathic consultation, specialist consultation, hospital treatment, traditional caregiver consultation, imaging tests, laboratory tests, Western medicine (prescribed and non-prescribed), traditional medicine (prescribed and non-prescribed). Indirect costs included: Transportation of patient, travel costs for accompanying persons, costs for hospital visits, food during hospitalization, gifts to health personnel. Lost income was not included in the analysis of indirect costs.

approach has limitations, as the standard deviation itself, similarly to the mean, is influenced by extreme values.[557] Hence, several alternative approaches were calculated to determine high-cost households and individuals. The simplest approach – as taken by the studies cited above – was to calculate the 10% of households with the highest health care costs. However, this approach can be problematic with highly right-skewed variables, as it remains unclear how much these household diverge from the mean of the distribution. An alternative approach was calculated using a Box-Cox power transformation, so that the skewness of the variable was 0. As this method alters the variable quite extensively, a more commonly used approach to correct for positively skewed variables was chosen, which was the creation of the natural logarithm of the expenditure variable. This method has shown a more reasonable selection of high-cost households, as compared to the simple application of a percentage. Hence, applying this method, high-cost households in this study were defined as households who had at least health care expenditures equaling the mean plus one standard deviation of the logarithm of the health care expenditure variable. Due to the different currencies, and differences in the institutional setting, the dichotomous variable defining high-cost households was calculated separately for each country and only later merged into an international variable. As a result, out of the 845 households who reported any illness episode in the three months prior to the survey, a total of 88 households (10.41%), having reported at least one illness episode, have been classified as high-cost households; using all households as a base, the percentage is 6.16%. Out of these high-cost households, 37 originated from Ghana and 51 from Malawi.[558]

The construction of the variable *high-risk households* was based on the literature review on risk adjustors in section 2.3.2. Out of the variables that had a clear effect on future health care needs and future health care expenditures, three relevant variables defining high-risk households could be operationalized for the construction of the variable: (1) number of chronic conditions in the household that existed during the last 12 months, (2) number of individuals over 55 years of age in the household and (3) number of hospitalizations that required long hospital stays of over 3 days during the last 24 months prior to the survey. A high-risk index was created on basis of these three variables. In case a household had more than one occurrence of one of three variables, the original variable was discounted, using a square root transformation before

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[557] Wilcox (2010): Fundamentals of Modern Statistical Methods - Substantially Improving Power and Accuracy, p. 32.

[558] In Ghana this equaled 10.76% of households reporting an illness episodes and 6.7% of the Ghanaian sample. In Malawi this equaled 10.18% of households reporting an illness episode and 6.16% of the Malawian sample.

calculating the index, in order to normalize the variances between the three variables and to avoid too strong an influence of one of the variables on the high-risk index. The index for high-risk households was then standardized to the value range of 0 to 1, with four categories in total. In case a dichotomous variable was needed for a particular analysis, the households were classified as high-risk households if the index was between 0.5 and 1. The resulting index was identified to lead to more reasonable index values than similar calculations using multiple correspondence analysis or principal component analysis, which had also been tested. 125 households were classified as high-risk households, with 77 (61.60%) in Ghana and 48 (38.40%) in Malawi.[559]

Fig. 5: Distribution of high-risk and high-cost households in overall sample
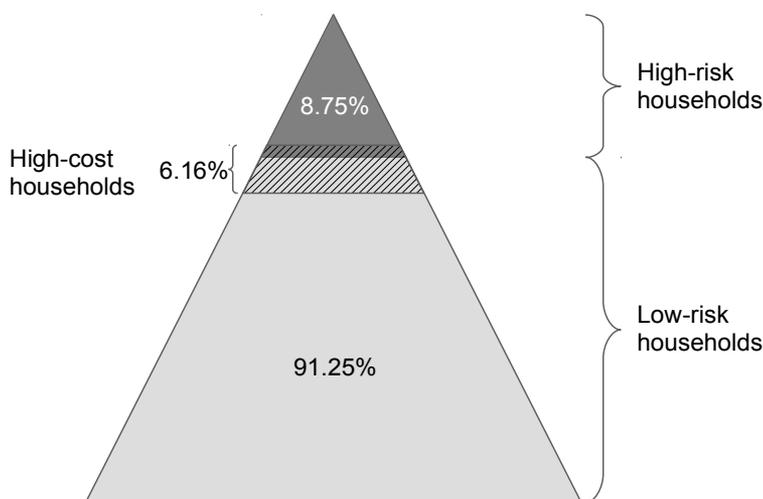
Source: Pro MHI Africa dataset

Figure 5 shows the distribution and overlapping of high-cost and high-risk households. Overall, 16.80% (21) of high-risk households were also found in the group of high-cost households, which is quite a high value, confirming the relevance of the selected variables for the high risk index. Out of all households identified as high-cost households, 21 out of 88 (23.86%) were also classified as high-risk households.

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[559] The relatively higher percentage of high-risk cases in Ghana was consistent over all three variables used for the construction of the high-risk index. The Ghanaian sample had a higher average age than the Malawian sample so that 73.42% of individuals over 55 years are from Ghana. Ghana accounted for 55.45% of the long hospitalization events and 46.01% of chronic conditions. Assuming an equal distribution, the expected percentages for all these variables were 42.02% according to the sample size.

The dependent variable for *Willingness to Pay* (WTP) reflected the value given by the respondent as the maximum willingness to pay for the hypothetical micro health insurance product. This maximum WTP was divided by the number of household members that the respondent wanted to insure, in order to get the willingness to pay per individual. Both the household willingness to pay and the individual willingness to pay were heavily right-skewed, which may violate the homoscedasticity assumption.[560] In order to reduce heteroscedasticity, and to produce a normally distributed variable, transforming the dependent variable, using a natural logarithm of the variable, is suggested. Figure 35 in Appendix 1 illustrates the distribution of the original and log transformed variables. Thus, with the transformed outcome variable, the regression model could be described as:[561]

$$\ln\left(WTP_i\right) = \beta_0 + \beta_1\, x_{i1} + \ldots + \beta_k\, x_{ik} + \varepsilon_i.$$

In the resulting regression model, the regression coefficients needed to be interpreted differently, as compared to a model without log transformation. Due to the transformation, the coefficients multiplied by 100 could be interpreted as percentage change of the non-transformed outcome variable.[562]

Tab. 13: List of independent variables and their measurements

Variables	Measurement
Household characteristics	
Household size	continuous variable
Mean age (mean of household members)	continuous variable
Child/adult ratio	continuous variable. (household members 0-17 years / household members 18+ years)
Child/adult ratio (dichotomous)	0 = Child/adult ratio <=1 1 = Child/adult ratio > 1
Household environment	1 = Rural 2 = Semi-urban 3 = Urban
Religion (predominant in household)	1 = Christian 2 = Muslim 3 = Traditional Religion 4 = Other
Highest education level in household	1 = No formal education or not completed primary 2 = Completed primary school 3 = Completed secondary school

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[560] Kohler et al. (2008): Datenanalyse mit Stata, p. 226.
[561] Fahrmeir et al. (2009): Regression, p. 71f.; Kohler et al. (2008): Datenanalyse mit Stata, p. 238f.
[562] Wooldridge, Jeffrey M (2003): Introductory econometrics, 2 edition. South-Western College Pub. Mason, Ohio, p. 43f.

	4 = Completed tertiary education
Occupation diversification in household	Continuous (0-4). Possible occupation categories of household members: Formal employment, farm earnings, business earnings, daily wages.
Household total monthly income (in Euro equivalent)	continuous
Household total monthly income (quintiles)	1 = 1st quintile (lowest) ... 5 = 5th quintile (highest)
Household wealth index (quintiles), MCA incl. durable assets, infrastructure, and animals (categorized) / Socio-economic status	1 = 1st quintile (lowest) ... 5 = 5th quintile (highest)
Household total monthly expenditures (quintiles)	1 = 1st quintile (lowest) ... 5 = 5th quintile (highest)
CHARACTERISTICS OF HOUSEHOLD HEAD (AND INDIVIDUALS)	
Sex (head of household)	0 = male 1 = female
Age (of head of household or individual) in years	Continuous/Count
Age groups (head of household)	0 = 14-24 years 1 = 25-34 years 2 = 35-44 years 3 = 45-54 years 4 = 44-64 years 5 = 65+ years
Age groups (all household members)	00 = 0-4 05 = 5-15 16 = 16-54 55 = 55+
Marital status (head of household)	0 = Single/Not in relationship 1 = Married/In relationship
Education (of head of household or individual)	1 = No formal education or not completed primary 2 = Completed primary school 3 = Completed secondary school 4 = Completed tertiary education
RISK EXPOSURE VARIABLES (SEE ALSO TABLE 12)	
Subjective risk exposure compared to other households general risks)	−2 = Much less −1 = Less 0 = About the same 1 = More 2= Much more

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Existence of chronic illnesses (household or individual)	0 = No 1 = Yes
Existence of long hospitalization stays (household or individual)	0 = No 1 = Yes

HEALTH CARE FACILITY-RELATED VARIABLES

Distance to closest primary care facility (in km)	0 = 0-<1 km 1 = 1 to <2.5 km 2 = 2.5 to <5 km 3 = 5 to <10 km 4 = >=10 km
Distance to closest primary care facility >= 5km	0 = 0- >5km 1 = >= 5km
Distance to closest general hospital (in km)	0 = 0 to <5 km 1 = 5 to <10 km 2 = 10 to <25 km 3 = 25 to <50 km 4 >=50 km
Distance to closest general hospital >= 10km	0 = 0- >10km 1 = >= 10km
Type of normally used primary health care facility	0 = Public or charitable facility 1 = Private facility
Satisfaction with the quality of health care	−2 = Strongly disagree −1 = Disagree 0 = Neither agree nor disagree 1 = Agree 2 =Strongly agree

SOCIAL RISK MANAGEMENT STRATEGIES (SEE ALSO TABLE 12)

Credit/loan/borrowing use by household	0 = No 1 = Yes
Savings (formal and semi-formal) use by household	0 = No 1 = Yes
Household membership in microfinance	0 = No 1 = Yes
Income diversification	0-3 (count variable).[563]
Income diversification (binary)	0 = No identifiable income source or only one source 1 = Two or three different income sources
Perceived likelihood of community assistance	−2 = Very unlikely −1 = Unlikely 0 = Neither likely nor unlikely 1 =Somewhat likely

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[563] Households could mention at maximum three main income sources out of following possible income sources of the household: Agricultural, business, remittances and cash transfers, daily wages, salaries, credit/borrowing.

	2 = Very likely
Household members contributing significantly to the household income	0 to 5 (count variable)
Household members contributing significantly to the household income (binary)	0 = No or only one household member 1 = Two or more household members
Share of household members contributing significantly to the household income	0 to 1 (Share of household members)
Highest participation in decision-making of all community associations' memberships	0 = Does not participate in decision making 1 = Somewhat active 2 = Very active 3 = Leader
Highest participation in decision-making of all community associations' memberships (binary)	0 = No participation or somewhat active 1= Very active or leader
Highest frequency of attendance of all community associations' memberships	0 = Never 1 = Less than once a month 2 = Once a month 3 = Once per two weeks 4 = Once a week 5 = More than once a week
Highest frequency of attendance of all community associations' memberships (3 categories)	0 = Never and less than once a month 1 = Once a month and once per two weeks 2 = Once a week and more frequent
Highest frequency of attendance of all community associations' memberships (binary)	0 = Less frequent than once a week 1 = Once a week and more frequent
Total number of memberships in community associations	0 to 7 (count variable)
Total number of memberships in community associations (5 categories)	0 = Zero membership 1 = One membership … 4 = 4 or more memberships
Household activity index in community associations	0 to 1 (lowest to highest activity)
Household activity index in community associations (3 categories)	0 = No or very low activity 1 = Low/Medium activity 2 = High activity
Household activity index in community associations (binary)	0 = No/low/medium activity 1 = High activity
Risk-related knowledge and attitudes	
Acknowledgment of insurance as risk management tool	−2 = Strongly disagree −1 = Disagree 0 = Neither agree nor disagree 1 = Agree 2 =Strongly agree

Satisfaction with current mode of health care financing	−2 = Strongly disagree −1 = Disagree 0 = Neither agree nor disagree 1 = Agree 2 =Strongly agree
Knowledge of insurance	0 = No 1 = Yes
Willingness to take risks	−2 = Absolutely unwilling to take risks −1 = Unwilling to take risks 0 = Neither willing nor unwilling to take risks 1 = Willing to take risks 2 = Absolutely willing to take risks

Source: author

The *socio-economic status (SES)* is an important independent factor for the well-being of households, their vulnerability to shocks, as well as the accessibility of SRM strategies. However, all relevant measures that aim to give an indication about the SES of households, such as household income, consumption expenditure and asset indices, are problematic. Wealth indices, on the basis of (mostly durable) assets of a household, have largely been developed within the framework of Demographic and Health Surveys (DHS), to be suitable for international comparisons. The computation of wealth indices has been steadily improving over the last two decades, so that they are now perceived to be superior to classic consumption-based measures that had proven to be problematic in their measurement.[564] In the statistical calculation of wealth indices, there have been recent advances, which make the indices more robust and comparable. Early calculations of wealth indices relied on factor analysis, which then was replaced by principal component analysis (PCA).[565] However, the latter has the main assumption that the underlying variable is on a metric scale and normally distributed; using binary or ordinal variables is a violation of the assumptions of PCA and leads to meaningless estimations. A solution to this is the more recent application of multiple correspondence analysis (MCA), which puts fewer constraints on the underlying variables, allowing for ordinal and categorical or dummy variables. It leads to similarly robust outcomes as PCA measures, if constraints are fulfilled.[566] However, it also comes with similar limita-

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[564] Rutstein, Shea Oscar; Johnson, Kiersten (2004): The DHS Wealth Index. DHS Comparative Reports. Calverton, Maryland (USA), p. 1. URL: http://www.pacificdisaster.net/pdnadmin/data/original/undp_disaste_profiles_ldcs_31.pdf.

[565] Booysen, Frikkie; van der Berg, Servaas; Burger, Ronelle; et al. (2008): Using an Asset Index to Assess Trends in Poverty in Seven Sub-Saharan African Countries. In: World Development, vol. 36, nr. 6, p. 1114.

[566] Ibid., p. 1114ff. and 1127.

tions, as PCA measures focus on the first main component and can explain only a small percentage of total variance of the assets data.[567] As the variables for this study were mostly dichotomous or ordinal, the wealth index was created on the basis of an MCA calculation and, subsequently, the creation of wealth quintiles was done independently for each country. In line with other studies on assets indices,[568] several variables were considered for the index, such as housing facilities, durable assets, infrastructure and animals (all binary or categorized in quartiles).[569]

Weighing the advantages and limitations of wealth indices, it was decided to use two measures of SES for analysis: household income and the aforementioned wealth index. Like measures based on assets, measures of household income are problematic, but provide an angle on the SES of a household other than wealth indices, as it focuses on the sources of livelihood. This can be of particular importance in the analysis of the application of SRM strategies by households; generally, income is more rapidly moving and fluctuating than asset holding,[570] and household income can be more quickly used as an SRM strategy (or to get access to other SRM strategies) compared to the sale of assets for risk management.

In the construction of the questionnaire, the main points of criticism on measuring household income were taken into consideration, such as recall problems and multiple income sources with fluctuating income.[571] Other problems, such as missing knowledge of income of other household members, or the tendency to hide income from interviewers, could not be manufactured in the research tool, so that a systematic bias may exist for all households.[572] In order to avoid the tendency of the respondent to neglect the income of other household members, the income was asked in multiple steps by

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[567] Howe, Laura D.; Hargreaves, James R.; Huttly, Sharon R. (2008): Issues in the Construction of Wealth Indices for the Measurement of Socio-Economic Position in Low-Income Countries. In: Emerging Themes in Epidemiology, vol. 5, nr. 1742-7622 (Electronic), p. 4.

[568] Ibid., p. 2; Booysen et al. (2008): Using an Asset Index to Assess Trends in Poverty in Seven Sub-Saharan African Countries, p. 1116ff.

[569] Following variables were included in the calculation of the asset/wealth index. Housing facilities: quality of house building material, quality of floor material, number of sleeping rooms, ownership of buildings, land ownership. Infrastructure: electricity, access to potable water. Durable assets: type of cooking facility, refrigerator, mattress, telephone (landline/cell phone), car, bicycle, motorcycle, agricultural machines, computer, TV, DVD-player, satellite dish, radio. Animals: Cattle, donkeys (not in Malawi), goats, pigs, sheep, guinea fowls (not in Malawi), chicken, ducks.

[570] Booysen et al. (2008): Using an Asset Index to Assess Trends in Poverty in Seven Sub-Saharan African Countries, p. 1117.

[571] The authors Howe et al. 2012 and Rutstein et al. 2004 mentioned some criticism on income measurement in low-income countries. Howe, Laura D.; Galobardes, Bruna; Matijasevich, Alicia; et al. (2012): Measuring Socio-Economic Position for Epidemiological Studies in Low- and Middle-Income Countries. A Methods of Measurement in Epidemiology Paper. In: International Journal of Epidemiology, vol. 41, nr. 3, p. 878; Rutstein et al. (2004): The DHS Wealth Index, p. 2f.

[572] cp. Rutstein et al. (2004): The DHS Wealth Index, p. 2.

asking first how many household members and who in the household were significant contributors to household income. In the second step the income of the individual contributor was asked starting from the most significant contributor. Additionally, often neglected income sources, such as annual sales of products, national and international remittances and income from government or organizations, were asked about separately and a monthly share of those sources was added to the household income. Due to the heavily skewed distribution of household income, quintiles were formed for each country separately. Additional in-kind measures of income, such as subsistence or in-kind income from farm work, were included in the research tool, containing provisions to convert these to money equivalents. However, this approach was not successful, as the results fluctuated extraordinarily and led to unreliable values. Therefore, the in-kind income information was not used in the analysis.

For some continuous independent variables, such as the wealth index, the total household income or health care expenditure, quintiles were created, in order to be able to compare the different groups and to allow inter-country comparisons. All quintiles were created first on a country level and only after their creation, merged into an international variable.

Monetary values were given in the local currency, Malawi Kwacha (MWK, MK) for Malawi and New Ghana Cedis (GHS, Gc) for Ghana. For country comparisons, the Euro equivalent was calculated using the average of the exchange rates for the duration of the household survey.[573]

7. Analysis

7.1. Descriptive analysis

The overall household survey sample consisted of 1428 households, with 7088 individuals. In Ghana, 600 households with 3088 individuals were interviewed and in Malawi, 828 households with 4000 individuals (table 14).

Table 14 also shows that, in some cases, the regional differences were larger than the international differences. In international comparison, the average household size in Ghana (5.2 individuals) was higher than the mean in Malawi (4.8); however, regional differences surpassed the international ones: for example, the mean of the Greater Ac-

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[573] The exchange was taken from OANDA Corp. providing historical exchange rates on the basis of the Interbank rate: http://www.oanda.com/lang/de/currency/historical-rates/. For the time frame of 8th of March – 5th of May 2009, the average exchange rate for Malawi was 1 EUR = 182.0409 MWK, and for Ghana 1 EUR = 1.8492 GHS.

cra region in the South of Ghana was 4.1 individuals per household, the lowest of all regions, while the Northern Region in Ghana had the highest mean (6.2).

Tab. 14: General sample description

	Household size (mean)	Household size (sd)	Interviewed households (N)	Total individuals
Ghana				
Greater Accra Region	4.11	1.89	301	1236
Northern Region	6.19	3.04	299	1852
Total Ghana	5.15	2.73	600	3088
Malawi				
Central region	5.13	2.21	387	1987
Southern region	4.57	1.91	441	2013
Total Malawi	4.83	2.07	828	4000
Overall Total	4.96	2.38	1428	7088

Source: own calculation, Pro-MHI-Africa dataset

On some basic household characteristics (table 15), differences between Ghana and Malawi were identified. Both, the mean age of the head of household (Gh: 45.4; Mw: 38.4 years) and the mean age of all households (Gh: 24.8; Mw: 21.3 years) in the sample were higher in Ghana compared to Malawi. The oldest age group, 55 years or older, had a higher share in Ghana than in Malawi (Gh: 7.2%; Mw: 3.0%). The child/adult ratio in Malawi was slightly higher in Malawi than in Ghana (Gh: 1.13; Mw: 1.18). These differences were consistent with the country-wide statistics, that the life-expectancy is lower in Malawi, which was partly an effect of the HIV/AIDS crisis in Malawi (see section 4.2.2). The higher share of female headed households in Ghana compared to Malawi (Gh: 21.5%; Mw: 16.3%) was also consistent with other country studies (section 4.1). The educational level of the head of household was generally higher in Malawi, with a median at *education of completed secondary schoo*l, compared to the median education in Ghana, which was the category *no formal education or not completed primary school.*

Tab. 15: Basic household characteristics

	Ghana		Malawi		Total	
	mean	sd	mean	sd	mean	sd
Age of head of household[574]	45.4	14.1	38.4	11.6	41.4	13.2
Share of female headed households[575]	21.5%		16.3%		18.5%	
Education level of head of household						
No formal education[576]	56.2%		17.6%		22.8%	
Completed primary school	5.7%		28.4%		18.8%	
Completed secondary school	33.5%		45.8%		40.6%	
Completed tertiary school	4.7%		8.2%		6.7%	
Average age of household	24.8	11.4	21.3	8.3	22.8	9.9
Share of age groups (all individuals)						
0-4	14.8%		14.0%		14.4%	
5-15	31.4%		32.8%		32.2%	
16-54	46.5%		50.2%		48.6%	
55+	7.2%		3.0%		4.9%	
Percentage of females (all individuals)	51.8%		49.1%		50.3%	
Child/adult ratio[577]	1.13	0.94	1.18	0.98	1.16	0.96
Religion						
Christian	54.3%		89.8%		74.9%	
Muslim	43.7%		7.5%		22.7%	
Traditional	1.3%		1.8%		1.6%	
Other	0.7%		0.9%		0.8%	
Household environment						
Urban	31.5%		34.7%		33.3%	
Semi-urban	9.3%		25.6%		18.8%	
Rural	59.2%		39.7%		47.9%	

Source: own calculation, Pro-MHI-Africa dataset
Notes: N=600 (Ghana), N=826 (Malawi), N=1426 (Total)

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[574] In 32 households the age of the head of household was imputed, because either no head was indicated (18 in Ghana, 8 in Malawi) or the age of the head of household was missing (6 households). In these cases, the age of the oldest person in the household was used as age of the household head. Without imputation, the mean age is 45.3 (Ghana, N=580), 38.5 (Malawi, N=816), 41.3 (Total, N=1396)

[575] In 24 households, no head of household was indicated. For these households, a male head of household was assumed and imputed. Without the imputation, the share of female headed households is 22.2% in Ghana (N=582), 16.6% in Malawi (N=820), Total 18.9% (N=1402).

[576] Lowest educational class was "*No formal education or not completed primary school*".

[577] Child was defined as 0-17 years of age.

In the overall country sample from Ghana, the proportion of Christian households (54.3%) was about 10 percent points higher than Muslim households. The two regions in Ghana differed significantly in terms of the predominant religion: In the Northern region, Muslim households were the majority with 83.3% and Christian households represented 14.7%. In Malawi, there was no substantial regional difference regarding the predominant type of religion, Christianity was the dominating religion (89.8%) with Islam second (7.5%).

The typical household environment (urban, semi-urban, rural) of the sample in Ghana was predominantly rural (59.2%), while the share of rural households in the Malawian sample was lower (39.7%). The household environment in Malawi differed quite strongly between the regions: The share of rural households in the Central region was 57.1%, while the share was lower in the Southern region (24.5%). The reason was the catchment area of the partner organization FINCA, in the Southern region of Malawi, spreading out from the urban area in Limbe (near Blantyre), where the head quarter of the partner MFI, for the Southern region, was located. The cities of Blantyre and Limbe have grown together and form the economic centre of Malawi. FINCA's membership spread from this central point, to the far outskirts of Limbe and Blantyre. On the other hand, the catchment area of MUSCCO's Saving and Credit Cooperative, in the Central Region, spread predominantly in rural areas. Also, in Ghana, there were differences between the regions: The Northern region was more rural (64.9%) while the Greater Accra region had a share of 53.5% of rural households.

Tab. 16: Economic characteristics of household

	Ghana		Malawi		Total	
	mean	sd	mean	sd	mean	sd
Total monthly household income	Gc 226.36 (≈€ 122.41)	Gc 263.25 (≈€ 142.36)	MK 42 083 (≈€ 231.17)	MK 88 962 (≈€ 488.69)	≈€ 185.41	≈€ 386.87
Total monthly household non-health expenditure	Gc 376.51 (≈€ 203.61)	Gc 961.88 (≈€ 520.17)	MK 24 652 (≈€ 135.42)	MK 25 636 (≈€ 140.83)	≈€ 164.11	≈€ 355.46
Total annual household non-health expenditure[578]	Gc 2883.87 (≈€ 1559.56)	Gc 6378.23 (≈€ 3449.25)	MK 300 909 (≈€ 1652.97)	MK 301 593 (≈€ 1656.73)	≈€ 1613.67	≈€ 2567.54

Source: own calculation, Pro-MHI-Africa dataset
Notes: N=600 (Ghana), N=826 (Malawi), N=1426 (Total)

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[578] The annual non-health expenditure was asked separately from the monthly expenditures. Therefore, it did not equal the amount of twelve times a month.

The arithmetic mean of the total monthly income of households[579] in the sample was relatively higher in Malawi (€ 231) than in Ghana (€ 122) (table 16). The distribution of the monthly total household income in both countries was positively right skewed with long right tail, leading to a mean income which was influenced by extreme values. This was particularly the case in Malawi, where the standard deviation of the monthly income was twice the mean value. Therefore, looking at more robust measures than the mean, gave a better overview of the income situation. The α-trimmed mean (α=0.5) of the monthly income in Malawi only showed MWK 28 999 (≈€ 159.30) and an even lower median of MWK 20 000 (≈€ 109.87). In Ghana, the income distribution was not as right skewed as in Malawi, but the α-trimmed mean of the total monthly income GHS 190.93 (≈€ 103.25) was still lower than the mean value, but slightly higher than the median of GHS 152.08 (≈€ 82.24). Table 17 gives an overview of the quintiles of the total household income. In all quintiles, the mean of the total income of households in Malawi was consistently above the mean income in Ghana, with the largest relative difference in the richest 5th quintile.

Tab. 17: Monthly total household income (quintiles)

| Quintile | | Ghana | | | | Malawi | | |
	N	Mean	Min	Max	N	Mean	Min	Max
1st quintile	122	Gc 40.92 (≈€ 22.13)	0 (0)	70 (37.85)	166	MK 4957 (≈€ 27.23)	0 (0)	8653 (47.53)
2nd quintile	120	Gc 96.82 (≈€ 52.36)	70.83 (38.31)	120 (64.89)	174	MK 11 783 (≈€ 64.73)	8667 (47.61)	15 000 (82.40)
3rd quintile	131	Gc 162.93 (≈€ 88.11)	121.67 (65.80)	200 (108.16)	157	MK 20 112 (≈€ 110.48)	15 008 (82.44)	25 750 (141.45)
4th quintile	107	Gc 250.60 (≈€ 135.52)	201.67 (109.06)	303.33 (164.04)	170	MK 35 562 (≈€ 195.35)	25 833 (141.91)	50 000 (274.66)
5th quintile (highest)	120	Gc 592.08 (≈€ 320.19)	306.67 (165.84)	3204.50 (1732.95)	161	MK 141 162 (≈€ 775.44)	51 250 (281.53)	1 106 667 (6079.21)

Source: Pro MHI Africa dataset

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[579] The total monthly household income included monthly income as well as 1/12 of other (more irregular) income sources during the past 12 months. Therefore, it might be higher than other country data that only considered the income in one month.

7.2. Household exposure to general risks

As introduced in section 2.2, households are exposed to a variety of risks that can be categorized in social, political and economic, natural and environmental risks, as well as health risks. Poor or near-poor households in low-income countries are particularly exposed and affected by risks. In the sample of the household survey, the vast majority of households, 1191 (=83.40%), reported that they faced at least one of the 15 general household risks (listed in figure 6) in the last three years, with an average of 2.76 (median 3) risks in all households. About eleven percent points fewer households, 1030 (=72.13%) out of all households, were facing an array of severe general risks, those that were reported to have negative economic impact on the household, such as asset reduction, loss of income, reduction in consumption or indebtedness. Many households reported an exposure to more than one type of risk that, altogether, caused negative economic impact on the household (table 18). On average, a household was exposed to 2.38 severe general risks (within the last three years) with a median of 2 types of risk.[580]

Tab. 18: Household exposure to general risks (all and severe risks)

	Frequency	Percent	Frequency (negative economic impact)	Percent (negative economic impact)
No risk exposure	237	16.60%	n/a	n/a
1-3 risks	748	52.38%	655	45.87%
4-6 risks	358	25.07%	305	21.36%
more than 7 risks	85	5.95%	70	4.90%
Total of households with risk exposure	1191	83.40% (out of all)	1030	72.13% (out of all)

Source: Pro MHI Africa dataset. Household data. N=1428 households.

It was hypothesized (hypothesis 1) that types of general risk, as well as the extent of general risk exposure, showed a significant geographic variation between countries, regions and between categories of the household environment. The sub-hypotheses were analyzed using bivariate and multivariate methods.

The mean number of severe general risks (in brackets severe non-health related general risks) significantly differed between both countries:[581] The mean for Ghana was

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[580] The variable on general risks comprised 15 types of risks (see figure 6). In the case of the variable *severe general risks*, they were counted if the household indicated that the risk exposure with the mentioned risks had a negative economic impact on the household.

[581] A t-test showed a highly significant difference between the two countries for the means of severe risks t(1426)=6.550,p<0.001 and severe non-health related risks: t(1426)=7.478,p<0.001.

2.81 (2.67), higher than the mean for Malawi 2.07 (1.88). The total mean for the severe non-health related general risks in the entire sample was 2.21.[582] Also, the types of risks reported by households substantially differed between Ghana and Malawi. Figure 6 gives an overview of the frequency of risk types that had a negative economic impact as reported by households.[583]

Fig. 6: Household exposure to general risks with negative economic impact, by country
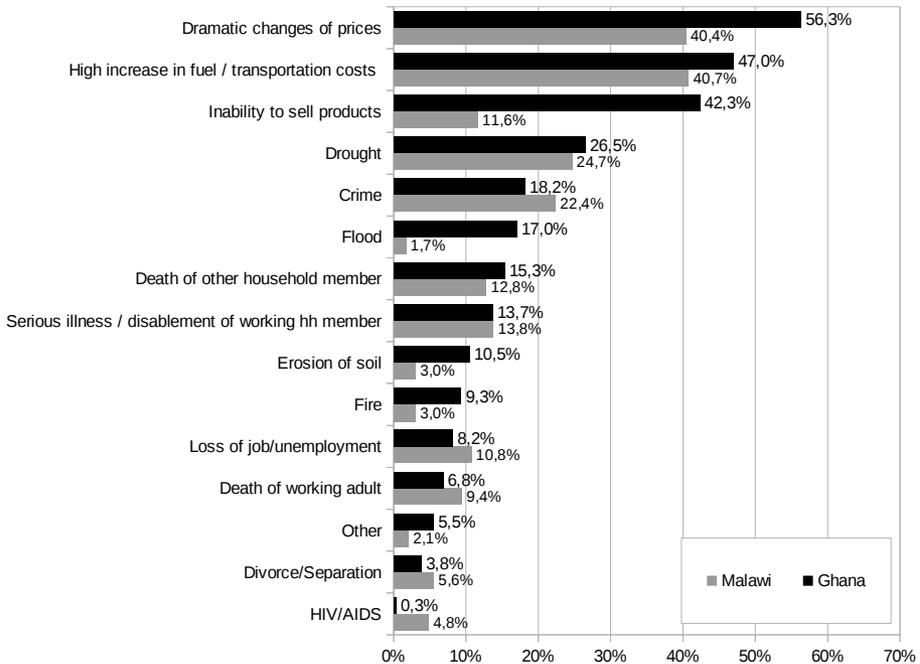
Source: Pro MHI Africa dataset. Household data. Ghana N=600, Malawi N=828, Total N= 1428

Economic risks were the type of risk affecting most of the households in the sample: dramatic price fluctuations and price increases of fuel and transportation costs were the two most frequently mentioned risks, by 56.3% and 47.0% of households in Ghana and 40.4% and 40.7% in Malawi, respectively. The lack of functioning markets, in the form of being unable to sell products, was a major concern for Ghanaian households (42.3%), but much fewer households in Malawi (11.6%) were affected. Shocks related to

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[582] The variable on (severe) non-health related general risks included 13 types of risks, excluding the household-level risks of "HIV/AIDS" and "Serious illness or disablement of working hh member".

[583] The analyses of section 7.2 referred to all reported risks, including two generalized health risks: *HIV/AIDS* and *serious illness / disablement of working household member*. The analyses in subsequent sections were based on the same variable without the two health-related general risks in order to avoid overlapping and circular argument.

unemployment or job loss were reported by 8.2% in Ghana, while households in Malawi faced a higher prevalence (20.8%).

Natural and environmental risks were also experienced by many households: Drought was mentioned by 26.5% of households in Ghana and by 24.7% in Malawi. Ghana respondents had a much higher exposure to other natural and environmental risks compared to Malawi respondents: In Ghana, flood was reported by 17.0% (Malawi 1.7%) of households, erosion of soil by 10.5% (Mw. 3.0%) and fire by 10.5% (Mw. 3.0%). Crime, as a social risk, was the next frequent risk reported at 18.2% in Ghana and 22.4% in Malawi.

Experience with death of a household member was reported by over 22% of households, independent of the country, but death of a working adult was mentioned more often in Malawi at 9.4% compared to Ghana at 6.8%.[584] In both countries, not only the psychological and economic burden of losing a person, but also considerable funeral costs put an additional financial burden on affected households.[585]

Severe health-related household shocks, such as disabilities or serious illnesses, were mentioned by over 13% of households in both countries. The risk of HIV/AIDS was a minor risk in Ghana (0.3%), but high in Malawi (4.8%); a figure which was still prone to under reporting, as it was approximately half of the national average of 10.6% prevalence rate among adults.[586]

Tab. 19: Household exposure to general risks with negative economic impact by regions and household environment (% of households)

	Ghana regions		Malawi regions		HH environment		
	Greater Accra	Northern	Central	Southern	Rural	Semi-Urban	Urban
Drought	17.2	52.8	49.6	24.2	38.6	48.3	24.3
Flood	3.4	40.4	2.9	2.0	17.7	5.1	5.5
Erosion of soil	8.3	19.6	8.8	1.1	11.8	6.8	5.0
Fire	2.9	21.3	8.8	1.1	11.2	2.8	5.8
Crime	17.6	31.1	46.7	20.8	27.6	31.8	28.2
Dramatic changes of prices	73.5	80.0	41.3	67.0	65.4	49.4	72.7

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[584] Like for the other general risks, deaths in the household were only counted in this analysis, if the household indicated that the array of general risks had negative economic impact on the household.

[585] Hougaard, Christine; Chamberlain, Doubell (2012): Funeral Insurance. In: Churchill, Craig; Matul, Michal (eds.): Protecting the Poor. A Microinsurance Compendium, vol. 2. International Labour Office / Munich Re Foundation. Geneva/Munich, p. 221; Flory et al. (2009): The Poor and Their Management of Shocks, p. 32f.

[586] Government of Malawi (2012): 2012 Global AIDS Response Report. Malawi Country Report for 2010 and 2011.

Inability to sell products	74.0	43.8	20.8	13.1	40.9	25.0	29.0
Loss of job/unemploy- ment	15.7	7.2	15.4	14.8	12.8	14.2	13.8
High increase in fuel/transportation costs	45.1	80.9	50.4	61.5	58.9	51.7	65.7
Death of work. adult in hh	2.9	14.9	14.2	12.5	10.2	13.1	12.7
Death of other hh member	24.5	17.9	17.5	18.2	20.9	18.2	17.4
Serious illness or disease	6.4	29.4	15.4	21.9	20.9	14.8	18.5
HIV/AIDS	0.0	0.9	4.2	8.5	2.0	3.4	7.2
Divorce/Separation	5.9	4.7	10.0	6.3	7.9	7.4	4.7
Other	2.5	11.9	4.2	2.0	6.3	5.1	2.8

Pro MHI Africa dataset. Household data. N= 1428

Table 19 shows not only strong international differences in risk exposure, but also remarkable regional differences and differences depending on the type of environment where the household was located.[587]

The overall number of severe general risks differed significantly between the types of environment: Semi-urban households were least exposed, with a mean of 1.95, while rural (2.54) and urban (2.38) had exposure to a higher number of risks.[588] When looking at details on the type of risks to which the households in the different environments were exposed, it was identified that rural households were substantially more often affected by flood, erosion of soil, and fire. Drought was a concern of all three types of household environments and most often reported by semi-urban households, followed by rural households. The inability to sell products was a larger concern by rural households, pointing to difficult commodity markets in rural areas.

In the comparison between regions, the Northern region in Ghana differed significantly from all other regions. First, the mean of total reported severe risks that the households were exposed to was higher in the Northern region of Ghana (3.59), compared to the other regions (Gh. Greater Accra = 2.03; Mw. Central region = 1.92; Mw. Southern region = 2.19). The Northern region in Ghana was the only region that was statistically different from each of the other regions (Bonf., p<0.001) using the Bonferroni multiple-comparison adjustment.[589] Households in this region also reported a

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[587] The variable *household environment* was recorded in the categories urban, semi-urban and rural.

[588] The F-test of the overall ANOVA model was highly significant F(2,1425)=7.32, p<0.001. However, Bonferroni multiple-comparison test showed that urban and rural households did not significantly (Bonf. p=0.642) differ in terms of number of severe general risks exposed to. On the other hand, the difference between semi-urban households and rural households was highly significant (Bonf. p<0.001), while the difference to urban households was significant (Bonf. p<0.05).

[589] The presented significance levels referred to the comparisons of the Northern region with each of the other regions. The differences between the other regions were not statistically significant. Analyzing more in-depth the concentration of households reporting large numbers of severe risks

higher exposure to drought, flood, erosion of soil, fire, dramatic changes in prices, high increase in fuel/transportation costs, death of working adult in household, serious illness or disease, and other risks, in comparison to the other regions. Also, within Malawi, the regions strongly differed in terms of the type of risks households were exposed to: for example, in the Central region drought (49.6%) and crime (46.7%) were mentioned more than twice as often as in the Southern region (24.2% and 20.8%).

Tab. 20: Relationship of wealth quintiles and exposure to severe non-health related general risks (both countries)

	Wealth index (quintiles); MCA incl. Durable assets, infrastructure, animals					
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
No risk exposure	25.17	31.49	23.76	29.02	32.28	28.36
1-3 risks	46.50	49.48	47.87	48.60	51.58	48.81
4-6 risks	20.98	14.53	24.47	20.63	15.44	19.19
>=7 risks	7.34	4.50	3.90	1.75	0.70	3.64
Total	100%	100%	100%	100%	100%	100%

Source: Pro-MHI-Africa household data. N = 1428 households. τ_b=-0.063 z=2.74, p<0.01. $\chi^2(12)$=37.76, p<0.001

Looking at the relationship of the wealth status of households and the pure general risk exposure (i.e. number of severe non-health related risks), there was only a weak negative relationship, if aggregated over both countries (τ_b=-0.063 z=2.74, p<0.001) (see table 20), concluding that wealthier households were only slightly less exposed to severe general risks.[590] Looking at the Ghana sub-sample, the relationship substantially increased (τ_b=-0.147 z=4.46, p<0.001), but τ_b still indicated a weak relationship, while the relationship completely lost significance in the Malawian sub-sample (τ_b=-0.013 z=0.45, not sig.). On the other hand, in the Ghanaian case, the wealthiest quintile of households had a mean risk exposure to general non-health related risks, which was 1.6 points lower than the mean of the least wealthy quintile, a difference which was highly significant (Bonf. p<0.001).[591] Cohen's d (δ=0.68) confirmed a medium to strong effect size between the lowest and the highest wealth quintiles regarding general risk

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[590] that they were exposed to, they were clustered in five out of ten villages in the Northern region of Ghana, predominantly rural with a share of 88.7% of rural households in these villages/communities. The F-test of the overall ANOVA model was highly significant, F(2,1424)=45.02, p<0.001, meaning that there was a highly significant statistical difference between the means of the regions, which mostly needed to be attributed to the distinct Northern region in Ghana.

[590] The overall ANOVA model confirmed statistically significant differences between the wealth quintiles: F(4,1423)=5.34, p<0.001.

[591] The ANOVA model on the Ghanaian sub-sample confirmed statistically significant differences between the wealth quintiles: F(4,1423)=5.34, p<0.001.

exposure in Ghana. Comparing these two groups in the Malawian sub-sample, there was a slight, but not significant relationship in the same direction.[592]

Contrary to the wealth index, the monthly total household income had no significant relationship with household exposure to severe non-health related risks in the aggregated view over both countries and also not in the case of Malawi.[593] For the case of Ghana, τ_b was not significant, but the χ^2-test was ($\chi^2(12) = 34.45$, p<0.01). Comparing the lowest and highest income quintile indicated a slight negative relationship, which was not significant for any sub-sample.

Tab. 21: Relationship of education of head of household and exposure to severe non-health related general risks (both countries)

	No formal education	Completed primary school	Completed secondary school	Completed tertiary school	Total
No risk exposure	24.64	33.33	30.65	19.35	28.36
1-3 risks	45.17	46.97	50	65.59	48.81
4-6 risks	22.79	18.56	17.29	13.98	19.19
>=7 risks	7.39	1.14	2.05	1.08	3.64
Total	100 %	100 %	100 %	100 %	100 %

Source: Pro-MHI-Africa household data. N = 1428 households. τ_b=-0.078 z=3.26, p<0.01. $\chi^2(9)$=50.30, p<0.001

Similar to the relationship of wealth and household exposure to severe non-health related general risks, the educational level of the head of household showed (table 21) a weak negative relationship for the total sample (τ_b=-0.076 z=3.31, p<0.01). Comparing the mean of severe non-health related general risks of households with the lowest educational level of the head of household (mean 2.645) to those households whose head completed secondary education (mean 2.017), showed that exposure was reduced by 0.628 points (Bonf., p<0.001) for higher educated head of households in the overall sample; the mean of those households whose head completed tertiary education (2.149) was still 0.50 points lower, but not statistically significant.[594] In the case of Ghana, the

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[592] The overall ANOVA model on the Malawian sub-sample did not show significant differences between the wealth quintiles: $F(4,823)$=1.55, p=0.1854. Between lowest and highest wealth quintile: Bonf. p=1.000, but Cohen's δ (0.19) indicated a small effect size.

[593] The ANOVA model did not show significant differences between the income quintiles: $F(4,1423)$=0.92, p=0.4488.

[594] The same comparison in the Ghana or the Malawi sub-sample did not lead a satisfying significance level. In the case of completed tertiary education, it could be a result of lower frequencies in this category. The overall ANOVA model showed highly significant differences between the educational levels: $F(3,1424)$=12.36, p<0.001.

strength of the overall relationship slightly increased to (τ_b=-0.092 z=2.62, p<0.001), but in the case of Malawi (τ_b=0.0037 z=0.01, not sig.), it lost relationship and significance.[595]

The multivariate analysis of the determinants on the number of severe non-health risks as reported by households is displayed in table 22 and 23. Since the dependent variable showed some level of skewness and the models revealed some level of heteroscedasticity, the Huber-White sandwich estimator was used for the regression models, in order to get more robust coefficients.[596] All indicators in the five estimated models showed a negligible level of collinearity, so that no further adjustment had to be made. Generally, it should to be noted that the number of different severe risks was a relatively weak proxy for general risk exposure. This was because repeated shocks of the same type were not counted more than once in this variable and different levels of severity were not taken into consideration. However, the results of the presented multivariate models gave first insights into the relevance of factors.

The model 1a[597] focused on factors related to socio-economic characteristics of households. The factors included in the model explained only 8.7% (adj. R^2) of the variance in the dependent variable. The model showed that being located in Malawi reduced the general risk exposure by about 0.5 points, compared to Ghana. Household size and the age of the head of household showed a small but statistically significant positive effect (=increase) on risk exposure. It was surprising that the predominant religion in the household was strongly related to general risk exposure; predominantly Muslim households, or members of another religion, had significantly increased risk exposure compared to Christian households, by 0.65 and 1.17 points, respectively.

Overall, the measure ω^2 showed that only three variables in the model were relevant contributors to the explained variance of the model: *Household country* (ω^2=0.0131), *predominant religion of the household* (ω^2=0.0179) and the *wealth quintile* of the household (ω^2=0.0101), all three variables with a small effect size.[598] Model 1b added the two variables of health risk exposure and self-perceived general risk exposure; both were

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[595] The overall ANOVA model for Ghana was significant F(3,596)=2.81, p<0.05, for Malawi only at 10% significance level F(3,824)=2.28, p<0.1. Bonferroni multiple-comparison test did not show significant differences between single groups in neither Ghana nor Malawi.

[596] The null hypothesis of the Breusch-Pagan test (model 1c) for heteroscedasticity could not be rejected (χ^2(1)=112.14, p<0.001). The test for normality showed a highly significant level of skewness (p<0.001). The dependent variable had a values range only from 0 to 11 and the skewness partially stemmed from 28.4% of households reporting zero non-health risks with negative impact, it was decided not to perform any further transformations to the dependent variable itself.

[597] Specification of regression model 1a: F (18,1409)=6.59, p<0.001.

[598] The thresholds for omega^2 values is >=0.01 representing a small effect, >=0.06 a medium effect and >=0.14 is considered to be a large effect. Acock (2012): A Gentle Introduction to Stata, p. 231.

not significant and the adjusted R^2 even slightly decreased.[599] Model 1c added a variety of factors representing social risk management strategies. The adjusted R^2 significantly increased to 11.1%, still a weak to moderate explanatory power.[600] However, the factors added in model 1c may have been both cause and effect of higher general risk exposure and, therefore, needed to be carefully interpreted. Three SRM-related variables showed a statistically significant relationship: A higher level of income diversification was related to higher general risk exposure, as a 1-unit change was associated with a 0.170 change in the dependent variable; similarly, a positive relationship existed with a high activity level in community associations (0.942) and the use of credit or loans by the household (0.282). Households who acknowledged that health insurance helped pay for costly health events showed a significantly higher general risk exposure, by 0.296.

Calculating ω^2 showed that only two variables substantially contributed to the explained variance in model 1c: *Household wealth* (ω^2=0.0113) and *predominant religion in the household* (ω^2=0.0145), both with a small effect size.

Tab. 22: Determinants of number non-health risks with negative economic impact exposed to (multivariate linear regression)

	Model 1a		Model 1b		Model 1c	
Country Malawi (base: Ghana)[c]	−0.551***	(0.1195)	−0.548***	(0.1194)	−0.605***	(0.1746)
Education level of head of household	0.0945	(0.0645)	0.0939	(0.0648)	0.0835	(0.0644)
Household size	0.0818***	(0.0308)	0.0815***	(0.0311)	0.0690*	(0.0395)
Age of head of household	0.00896*	(0.0046)	0.00862*	(0.0047)	0.00851*	(0.0047)
Predominant religion: Muslim[c] (base: Christian)	0.646***	(0.1549)	0.644***	(0.1555)	0.540***	(0.1572)
Predominant religion: Other[c] (base: Christian)	1.174***	(0.3655)	1.178***	(0.3660)	1.184***	(0.3466)
Child/adult ratio	−0.00725	(0.0589)	−0.00720	(0.0589)	−0.00191	(0.0618)
Wealth index 2nd quintile (base: 1st)	−0.368**	(0.1730)	−0.370**	(0.1730)	−0.401**	(0.1714)
Wealth index 3rd quintile (base: 1st)	−0.00235	(0.1751)	−0.00609	(0.1759)	−0.0653	(0.1717)
Wealth index 4th quintile (base: 1st)	−0.366*	(0.1887)	−0.372**	(0.1893)	−0.456**	(0.1866)
Wealth index 5th quintile (base: 1st)	−0.682***	(0.1985)	−0.686***	(0.1987)	−0.753***	(0.2011)
Total monthly hh income 2nd quintile (base: 1st)	−0.239	(0.1666)	−0.240	(0.1669)	−0.287*	(0.1649)
Total monthly household	−0.154	(0.1707)	−0.156	(0.1710)	−0.225	(0.1702)

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[599] Specification of model 1b: F (20,1407)=5.95, p<0.001.
[600] Specification of model 1c: F (30,1397)=5.33, p<0.001.

income 3ʳᵈ quintile (base: 1ˢᵗ)						
Total monthly hh income 4ᵗʰ quintile (base: 1ˢᵗ)	0.0585	(0.1792)	0.0542	(0.1798)	−0.0711	(0.1867)
Total monthly hh income 5ᵗʰ quintile (base: 1ˢᵗ quintile)	−0.0964	(0.1878)	−0.100	(0.1882)	−0.283	(0.1945)
Household environment: urban (base:rural)ᵇ,ᶜ	0.105	(0.1130)	0.106	(0.1131)	0.124	(0.1132)
Type of primary health care facility: private (base: public or charitable)ᶜ	−0.119	(0.1329)	−0.119	(0.1328)	−0.120	(0.1355)
Distance to the closest hospital	−0.0425	(0.0534)	−0.0413	(0.0534)	−0.0355	(0.0541)
High risk household (health risks)			0.0889	(0.2690)	−0.123	(0.2640)
General risk exposure (self-perceived)			−0.0120	(0.0441)	0.00467	(0.0454)
Income diversification					0.170*	(0.0866)
Share of hh members contributing significantly to the income					0.215	(0.3387)
Acknowledgment of insurance as risk management toolᵇ					0.296***	(0.1147)
Household with health insuranceᵇ					−0.0545	(0.1653)
Membership in microfinanceᵇ					0.194	(0.1429)
Household use of credit/loansᵇ					0.282**	(0.1166)
Household use of savingsᵇ					0.153	(0.1094)
Decision-making role in associationsᵇ					−0.136	(0.1208)
Activity level in associations					0.942***	(0.3556)
Likelihood of community assistanceˡ,ᶻ					0.0143	(0.0344)
Constant	1.718***	(0.3663)	1.719***	(0.3675)	1.252***	(0.4102)
Observations	1428		1428		1428	
Adjusted R^2	0.087		0.086		0.111	

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Dependent variable: Number non-health risks with negative economic impact (exposure).
Notes: ^{b}=binary/dichotomous variable, ^{c}=categorical variable, ^{l}= likert scale, ^{q}= quintiles, ^{z}= centered variable. Robust regression estimates were applied due to skewness of the dependent variable.

When model 1c was split by country (table 23), the relevance of the coefficients significantly changed. The explanatory power of the model was substantially higher in

Ghana (adj. R^2 16.8%) compared to Malawi (adj. R^2 3.4%).[601] Compared to the three general models, in the Ghanaian model *education of the head of household* (0.165), the *share of household members significantly contributing to the household income* (0.966) and the *membership in MFI* (0.819), became significant and were positively related. In Ghana, five factors substantially contributed to the explanatory power of the model, similar to the general model 1c, religion (ω^2=0.0135) and the wealth level of the household (ω^2=0.0190), but additionally, household size (ω^2=0.0107), the level of income diversification (ω^2=0.0105) as well as membership in microfinance institutions (ω^2=0.01610); all significant and positively associated with general risk exposure. The finding in model 1a, that religion was an important factor, was analyzed more thoroughly in the within-country regression in Ghana: Being predominantly Muslim or member of another religion other than Christianity remained significant, but the region, which seemed to be a significant factor in the bivariate analysis, was rendered insignificant in the multivariate view. This indicated that the particular choice of two regions in Ghana was also the predetermining factor: The Northern region, in comparison to the Greater Accra region, was less wealthy, showed a substantially higher risk exposure and a predominantly Muslim population. These together made the distinction in the risk exposure of households in the Northern region in Ghana.[602] Hence, the economic and geographic differences were likely to outweigh the variable *predominant household religion.*

In the Malawian model, which had a quite low adj. R^2 of 3.4%, other factors showed a significant relationship with the dependent variable. The direction of the factor predominant household religion was different in Malawi compared to Ghana: being of Muslim belief reduced risk exposure (−0.440) while those who were members of other religions increased risk exposure (base: Christianity) by 0.689. Being located in the Southern region also increased risk exposure (0.243). Differing from Ghana and the overall model, in Malawi, the wealth quintiles did not have a significant effect and – counter-intuitively – the lowest income quintile led to a reduced risk exposure (−0.337), which was significant on the 10% level. Contradictory was the finding of higher self-perceived risk exposure, which corresponded to a lower risk exposure (−0.098). The household use of credit/loans in Malawi had a positive relationship with risk exposure (0.315) and a high *household activity level in community associations* increased the level of risk exposure by about 1.1 risks reported. Overall, the l*evel of household activity in community associations* (ω^2=0.0172) was the only variable contributing substantially to the explanatory power of the model in Malawi, representing a small effect size.

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[601] Specification of Ghana model (F $(30,569)$=5.26, p<0.001); Malawi model: (F $(30,797)$=1.92, p<0.01)

[602] In the Greater Accra region, 4.3% of households were of Muslim belief, while the share was 83.3% in the Northern region.

Tab. 23: Determinants of number non-health risks with negative economic impact exposed to: Country comparison (multivariate linear regression)

	Ghana		Malawi	
Region of household (base MW: Central region, base GH: Greater Accra region)	0.541	(0.3368)	0.243[*]	(0.1422)
Education level of head of household	0.165[*]	(0.0972)	0.0123	(0.0859)
Household size	0.133[**]	(0.0590)	−0.0435	(0.0517)
Age of head of household	0.0136[*]	(0.0072)	0.00357	(0.0062)
Predominant religion: Muslim[c] (base: Christian)	0.529[*]	(0.3077)	−0.440[**]	(0.2088)
Predominant religion: Other[c] (base: Christian)	1.881[***]	(0.5700)	0.689[*]	(0.3878)
Child/adult ratio	0.0505	(0.1362)	0.0489	(0.0642)
Wealth index, 2nd quintile (base: 1st)	−0.454	(0.3029)	−0.209	(0.1955)
Wealth index, 3rd quintile (base: 1st)	−0.216	(0.3026)	0.209	(0.2008)
Wealth index, 4th quintile (base: 1st)	−0.637[**]	(0.3192)	−0.197	(0.2241)
Wealth index, 5th quintile (base: 1st)	−1.223[***]	(0.3337)	−0.198	(0.2440)
Total monthly hh income 2nd quintile (base: 1st)	−0.298	(0.2912)	−0.337[*]	(0.1850)
Total monthly hh income 3rd quintile (base: 1st)	−0.275	(0.2834)	−0.127	(0.2049)
Total monthly hh income 4th quintile (base: 1st)	−0.223	(0.3239)	0.0678	(0.2293)
Total monthly hh income 5th quintile (base: 1st)	−0.311	(0.3088)	−0.177	(0.2521)
Household environment: urban (base:rural)[b,c]	0.00855	(0.2097)	0.170	(0.1448)
Type of primary health care facility: private (base: public or charitable)[c]	−0.0593	(0.2371)	0.0890	(0.1690)
Distance to the closest hospital	−0.00876	(0.0973)	0.0572	(0.0651)
High risk household (health risks)	−0.332	(0.3953)	0.0907	(0.3211)
General risk exposure (self-perceived)	0.126	(0.1031)	−0.0976[*]	(0.0498)
Income diversification	0.347[***]	(0.1289)	−0.0224	(0.1122)
Share of hh members contributing significantly to the income	0.966[*]	(0.5449)	−0.518	(0.4330)
Acknowledgment of insurance as risk management tool[b]	0.297	(0.1929)	0.165	(0.1439)
Household with health insurance[b]	−0.218	(0.2037)	−0.488	(0.3316)
Membership in microfinance[b]	0.819[***]	(0.2907)	−0.0874	(0.1682)
Household use of credit/loans[b]	0.296	(0.2018)	0.315[**]	(0.1431)
Household use of savings[b]	0.0661	(0.1942)	0.0919	(0.1348)
Decision-making role in associations[b]	−0.169	(0.2052)	0.0341	(0.1488)
Activity level in associations	0.391	(0.5919)	1.126[***]	(0.4305)
Likelihood of community assistance[l,z]	−0.0695	(0.0608)	0.0105	(0.0454)
Constant	−1.183	(1.2599)	0.968[**]	(0.4541)
Observations	600		828	
Adjusted R^2	0.168		0.034	

Standard errors in parentheses. * *p < 0.10,* ** *p < 0.05,* *** *p < 0.01.*
Dependent variable: Number of non-health risks with negative economic impact exposed
to. Notes: ^{b}*=binary/dichotomous variable,* ^{c}*=categorical variable,* ^{l}*= likert scale,* ^{q}*=*
quintiles, ^{z}*= centered variable. Robust regression estimates due to skewness of the*
dependent variable.

In conclusion, hypothesis H_{1a} postulated a significant relationship of geographic factors, such as country, region and household environment. There was a significant difference in type and extent of general risk exposure on all levels: between the two countries and between the sampled regions, while the difference between the regions within a country were sometimes larger than the international difference. A similar variation was observed when analyzing the type of risks that the households were exposed to, also with substantial inter-regional differences. The Northern region in Ghana, which showed the highest risk exposure, also showed a significant difference on the village/community-level (for details see footnote 589), so that the exposure in a particular five out of the ten communities increased the average of the Northern region. In the multivariate analysis (models 1a-1c), the international differences were highly significant. In the within-country regressions, the region was only significant in Malawi, but also relevant in the Ghana-specific regression model, where it was assumed that the combination of *household wealth* levels, *household religion* and *region* made the difference (albeit the variable *region* did not show a significant coefficient). In the bivariate analysis, the household environment was also a relevant factor, as semi-urban households faced the lowest general risk exposure. However, in the multivariate analysis, the household environment lost significance. Overall, hypothesis H_{1a} was confirmed as a result of several analyses.

Furthermore, it was hypothesized that the lowest wealth quintile and the lowest income quintile experienced the highest general risk exposure (H_{1b}), and that a higher level of education of the head of household reduced general risk exposure (H_{1c}). Both hypotheses were tested using bivariate and multivariate analyses. In conclusion, analyses on hypotheses H_{1b} and H_{1c} showed a more complex pattern than expected.

On hypothesis H_{1b}, the overall bivariate analysis and regression models 1a-1c confirmed a significant negative relationship between the wealth level of the household and general risk exposure. In the analyses split by country, substantial differences between Ghana and Malawi were observed: While, in the bivariate analysis, the factor household wealth level pointed in the right direction of relationship in Malawi, it was not a significant factor of general risk exposure. On the other hand, in the case of Ghana, it was a relevant factor with a medium to strong effect size and was statistically

highly significant. In Ghana, the lowest wealth quintile experienced the highest general risk exposure, which was consistent in the bivariate and multivariate analyses. In the Malawi-specific regression model, the wealth level pointed in the same direction without significant coefficients. In both countries, results on household income levels confirmed the hypothesized direction, but did not show a significant relationship with general risk exposure, neither in the bivariate nor in the multivariate analysis.[603] Hence, hypothesis H_{1b} was partially accepted in that there was a negative relationship of household wealth quintiles (with caution in the case of Malawi), while the hypothesized relationship of income was rejected.

Hypothesis H_{1c}, on the hypothesized negative relationship between a higher education level with general risk exposure, showed an inconsistent pattern of relationship. In the bivariate view, there was – as it was hypothesized – a small but significant negative relationship in the overall sample that became stronger in the Ghanaian sub-sample and lost significance in the Malawian sub-sample. In all multivariate regressions, the tendency of relationship inversed (contrary to the hypothesis), but remained insignificant, except for the Ghana-specific regression model which showed a significant positive relationship of educational level and risk exposure, different from expected. Overall, the results regarding hypothesis H_{1c} were unclear, therefore, the hypothesis was rejected.

A highly relevant combination of factors, in the case of the overall and the Ghanaian model, that was previously not hypothesized, was the combination of the factors household religion and household region, which showed a higher level of risk exposure among households in the predominantly Muslim Northern region of Ghana. Hence, this strong relationship referred to a combination of factors, rather than the importance of religion on general risk exposure. Furthermore, this relationship was not confirmed for the case of Malawi, and was inverted for Muslim belief, showing a significantly lower risk exposure. The positive relationship between a high household activity level in community-associations with general risk exposure in Malawi was worth noting, although cause and effect were not clear. On the one hand, this significant relationship might point in the direction that highly active households were less risk averse and, therefore, more exposed to a variety of risks, but on the other hand, households more exposed to risks seemed to build social capital that they can call upon in times of crises.

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[603] Except for the second income quintile in Malawi, which had significantly less risk exposure than the first (poorest) income quintile, Bonf. $p<0.1$.

7.3. Exposure of individuals and households to high health risks and high health care costs

7.3.1. Exposure to health risks

As described in section 2.3.2, the risk of illness and the extent of resulting illness-related costs are randomly distributed, but there are certain risk factors that make it more probable that illness and health care costs occur. Out of the factors discussed in the literature review, three relevant risk factors could be operationalized and were discussed in detail: Age, existence of chronic or permanent diseases and experience of hospitalization events with an inpatient stay longer than 3 days. It was hypothesized (hypothesis H_{2a}) that personal characteristics, such as a higher age group (55+ years), sex or pre-existing health condition (such as chronic or permanent diseases or long hospitalization stays) were a significant predictor of a higher health risk occurrence and, ultimately, high health care costs. Figure 7 shows the expected relevance of age as antecedent variable. Although all three factors were risk factors predicting higher future health care costs independent from each other, they were expected to be inter-related (see section 2.3.2 and 2.4.2 for a detailed discussion). In line with the literature review, these three factors were used at a later stage to form a high risk index on the household level which was helpful for multivariate analyses.

Fig. 7: Expected relationship between age, other risk factors and high health care costs
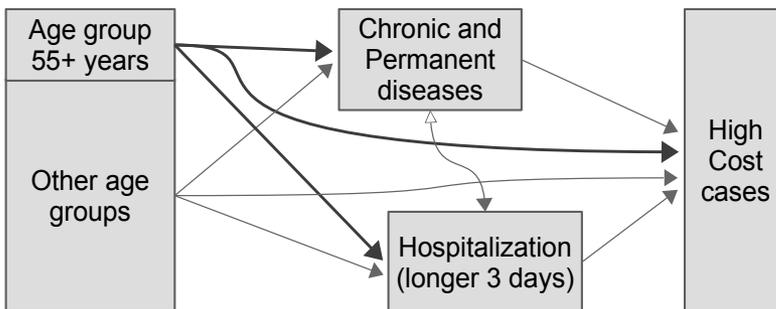
Source: author

In the overall sample of 7088 individuals, 344 (4.85%) were in the highest age group (55+ years). It was decided to choose the threshold of 55 years as risk factor in the case of Ghana and Malawi, due to the generally lower life expectancy compared to devel-

oped countries, where higher age thresholds are used in risk factor calculations.[604] The life expectancy in Ghana was higher than in Malawi, which was also reflected in the sample: Only 35.2% of the individuals in the highest age group stemmed from Malawi, although 56.4% (4000) of the entire sample (7088 individuals) were from Malawi. This lower percentage of older people in Malawi was explained by to the lower life expectancy of 49 years (as compared to 60 years in Ghana), which was partially explained by the HIV/AIDS epidemic in Malawi having amounted to annual mortality between 43 000 (in 2011) and 76 000 deaths (in 2005).[605,606]

The oldest age group reported 101 (7.5%) out of all 1352 recorded illness episodes. Thus, the odds of having an illness episode in this age group was 1.83 times as great as for any other age group ($\chi^2(1)$ = 24.80, p < 0.001). Not only was the likelihood of facing an illness episode increased, but also the likelihood of having chronic conditions or long inpatient visits: The odds of reporting a chronic or permanent illness was 5.66 times greater than any other age group ($\chi^2(1)$ = 159.74, p < 0.001), as 18.3% of all chronic conditions were reported by the highest, relatively small, age group. The results for hospitalization events of three days or longer were similar, although not as strong. 10.6% of all hospitalization stays (>= 3 days) and the odds of facing a long inpatient stay 2.41 times higher ($\chi^2(1)$ = 15,82, p < 0.001) related to this age group.

Not only was the illness prevalence higher in the oldest age group, but also the average costs of illness (illness episodes in the last three months). The mean cost of the highest age group was 35.16 Euro, more than double the cost of the other age groups, which was 15.13 Euro. Similarly, the α-trimmed mean still showed 10.12 Euro over 4.20 Euro. However, a t-test was only significant on the 10%-level (t(1350)=-1.4329, p<0.1), which was likely a result of the heavily right skewed distribution of health care costs.[607] The confidence intervals of the two groups (55+ vs. other age groups) were overlapping.[608] A measure for effect size, Cohen's d was 0.13, which represented a small

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[604] In the discussion on risk factors in risk adjustment schemes in Europe or North America, usually the threshold of 60 years or 65 years was used.

[605] World Health Organization (2012): Global Health Observatory Data Repository. Country Statistics. URL: http://apps.who.int/ghodata/?theme=country (accessed 2012/10/03), Year of measurement 2009.

[606] Mortality rates could be reduced in recent years due to antiretroviral therapy (ART). Government of Malawi (2012): 2012 Global AIDS Response Report. Malawi Country Report for 2010 and 2011, p. 4.

[607] Since the variable on health care costs violated assumptions of the t-test, the nonparametric two-tailed exact Kolmogorov-Smirnov two-sample test was additionally calculated and confirmed a significant relationship: K-S z=0.15, p<0.05.

[608] The 95% confidence interval of the other age groups is 7.6460-22.6071, compared with 7.7768-62.5424 for the age group 55+.

effect size. After a log transformation of the individual health care costs variable,[609] the t-test was significant on the 1% level (t(1350)=2.3885, p<0.01) and Cohen's d increased to 0.32, which was a medium effect. The result of a linear regression model with the log transformed health care costs as dependent variable using the Huber-White sandwich estimator showed that the health care costs increase by 105.9%, if the individual belonged to the oldest age group.[610]

Fig. 8: Total individual illness costs in Euro (illness episodes, 3 months) by gender
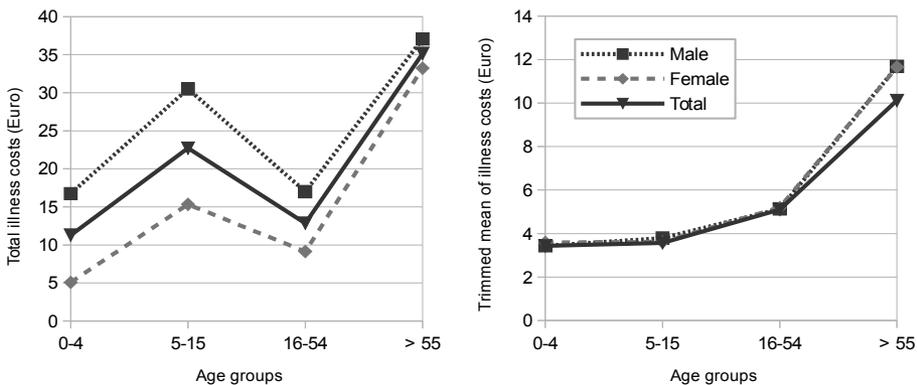
Source: Own calculation. Dataset: Pro MHI Africa, illness episodes
Note: the left figure is based on the arithmetic mean; the right figure applies the α-trimmed mean
(α =0.05).

Figure 8 gives an overview of the distribution of total individual illness costs in the last three months, split by gender. The left figure was calculated on basis of the arithmetic mean of health care costs. It was clearly visible that men consistently had higher health care costs than women, in all age groups. This indicated that there seemed to be a male bias in health care seeking and spending for treatment. However, in that figure, a male breadwinner bias could not be confirmed in the data, as the cost gap between male and female individuals narrowed with higher age groups and was comparatively low for individuals who were of the income-earning household member age. Furthermore, it was anticipated that women of reproductive age (age group between 15-49) would show higher health care costs than men. This seemed not to be the case in the

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[609]   As the natural logarithm of a zero expenditure is not defined, it was decided to add a minimum value of a tenth of a Euro Cent (0.001 Euro) to the health care expenditures variable.

[610]   Specification of regression model: F(1,1350)=5.34, p<0.05.

data.[611] Although extreme values in health care costs were very realistic, the right figure represents the same calculation on the basis of the α-trimmed mean not taking very extreme cases (i.e. in right skewed data this means the highest values) into the calculation. In the right diagram, we see a different picture of the health care costs distribution. The gender effect disappeared, because health care expenditure levels between male and female individuals were almost identical, using the trimmed mean.[612] Also, the high average health care costs of the second age group (5-15 years) were relatively much lower in the figure to the right, which was the result of a few (male and female) high-cost cases in the second age group. These cases were not considered in the calculation of the trimmed mean. In both graphs, consistent with the above discussion, the age group with the highest cost was the oldest age group, whereas the youngest group (0-4 years) consistently showed the lowest health care costs. The gender-difference in the left figure indicated that more male extremely high cost cases existed than female. Altogether, there was no clear gender bias in non-extreme health care costs (and utilization), but there seemed to be a slight gender bias with regard to very costly treatments.

Fig. 9: Total individual illness costs in Euro (episodes, 3 months) by country
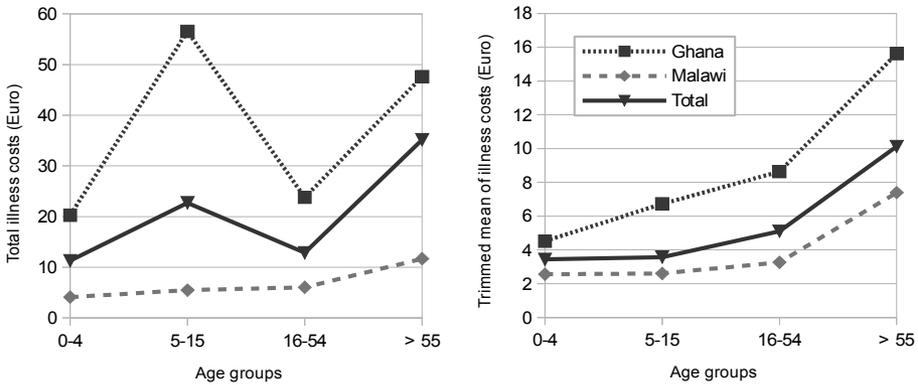
Source: Own calculation. Dataset: Pro MHI Africa, illness episodes
Note: the left figure is based on the arithmetic mean; the right figure applies the α-trimmed mean (α =0.05).

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[611] The questionnaire collected information on pregnancy-related health care utilization within the last five years which is not taken into consideration in this analysis.
[612] That the gender-independent total health care costs were lower than the values of both genders in the highest age group was a result of the calculation of the α-trimmed mean.

The individual total health care costs in the different age groups showed quite a consistent pattern, considering country differences between Ghana and Malawi (see figure 9). In all age groups, the level of spending in Euro equivalents in Ghana was consistently higher. As the economic situation between both countries was very different and since the exchange rate effect was unclear, a comparison of the absolute Euro values between Malawi and Ghana could not be done. However, it was clearly visible in the right graph that the increase in health care costs from the youngest to the oldest age group was much steeper in Ghana than in Malawi. Partially, it could be explained by the slightly higher mean age of the highest age group in Ghana (65.4 years), as compared to Malawi (62.2 years), but it could also be assumed that it was an effect of either epidemiological patterns or a function of the health care system. Furthermore, the left graph showed that the extreme values distorting the total individual health care costs in the second age group in figure 8 apparently occurred in Ghana.

Chronic and permanent diseases within the last twelve months were reported for 319 (4.50%) of 7083 individuals. Ghana had a slightly higher percentage of individuals who reported chronic conditions (4.80%), compared to Malawi (4.28%), although the difference was not statistically significant ($\chi^2(1)$= 1.217, p=0.270). This could partially be the result of higher life-expectancy in Ghana, which was reflected in the slightly older sample.

Fig. 10: Percentage of individuals with chronic conditions by age group
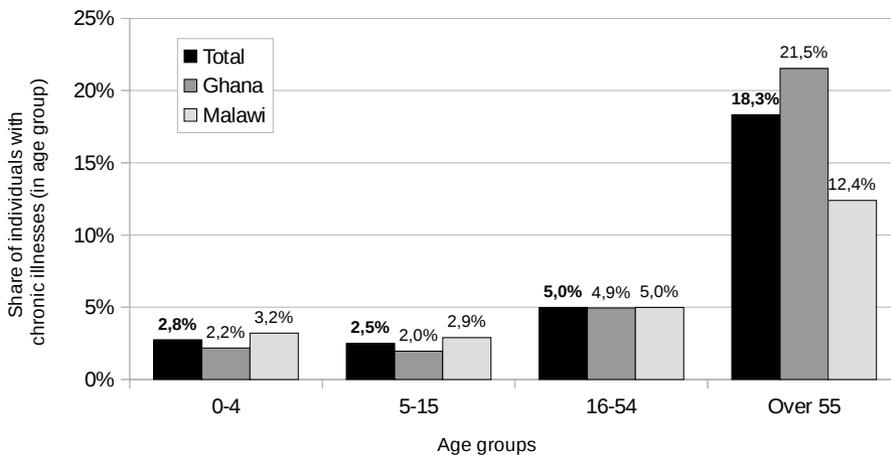
Source: Individual data, Pro MHI Africa dataset.

Figure 16 shows that the country difference (21.5% in Ghana compared to 12.4% in Malawi, (χ^2(1)=4.369, p<0.05) particularly stemmed from the oldest age group, in which the mean age was 3.1 years higher in Ghana (65.4 years) than in the Malawi sample. Generally, there was a substantial increase in chronic conditions in the older age groups, with a slight increase in the third age group, where 4.97% of individuals reported a chronic condition, to a much higher prevalence in the oldest age group, where 18.31% of individuals reported chronic illnesses, an about 6.5 times higher probability compared to the two lowest age groups. Also, the sex of the individual was associated with the prevalence of chronic conditions; women were more likely to have chronic conditions (5.50%) than men (3.52%) (χ^2(1)=16.085, p<0.001).[613]

Table 24 shows the results of a multivariate logistic regression with the existence of individual chronic disease as the outcome variable. In total, five regression models were estimated. Model 1a included all household and personal factors and showed a low adjusted McFadden Pseudo R^2 of 5.00% (unadjusted 6.26%).[614] Model 1b added variables on household risk exposure and accessibility of health care facilities. The adjusted Pseudo R^2 slightly increased to 5.20% (7.00%).[615] Model 1c added variables related to social risk management strategies, which increased the adj. Pseudo R^2 to 5.90% (8.45%).[616] All indicators in the three estimated general models 1a to 1c showed a negligible level of collinearity, so that no further adjustment had to be made. In the Ghana-specific regression model, the variable *region* showed a high level of collinearity with other variables (i.e. household religion and health facility variables). Hence, it was decided to drop the variable defining the region from these two country-specific regression models.[617]

In all three models (1a to 1c), variables on household location, such as country and household environment, did not show a significant relationship to individual chronic conditions. However, several personal characteristics were highly significant. Age was the most important predictor of chronic conditions, which was consistent in all three models. Compared to the age group 5-15, both older age groups, 16-54 and 55+, showed a significantly higher likelihood of having a chronic illness. The transformed regression coefficients in model 1c showed that belonging to the age group 15-54 increased the odds of having a chronic condition by 99.8%, while the effect was stronger for the oldest age group, 55+, which increased the odds of having a chronic condition

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[613] The association was significant in Ghana, men 4.17%, women 5.44%, χ^2(1)=2.711, p<0.1 and in Malawi, men 3.05% and women 5.55%, χ^2(1)=15.273, p<0.001.

[614] Model 1a specification: LR-χ^2(16)=162.92, p<0.001. Count R^2=0.955.

[615] Model 1b specification: LR-χ^2(22)=182.38, p<0.001. Count R^2=0.955.

[616] Model 1b specification: LR-χ^2(32)=219.87, p<0.001. Count R^2=0.955.

[617] see Acock (2012): A Gentle Introduction to Stata, p. 269.

by 793.8%. Female individuals were more likely to have a chronic condition than males, which was highly significant in all three models: The odds of having a chronic condition was 61.0% higher for women than for men. Education became significant only in model 1c and showed a negative relationship with chronic diseases, which means that the odds of having a chronic condition decreased by 12.2%, if the educational level of the individual increased by one unit. As chronic conditions are often non-communicable diseases, a life-style effect might have played a role. Compared to the middle wealth class (3rd quintile), in all three models, the fourth and the fifth quintile, showed a highly significantly elevated likelihood of chronic conditions. In model 1c, belonging to the fourth quintile increased the odds of chronic conditions by 81.2% and belonging to the fifth quintile increased the odds by 77.7%. The subjective variable, whether the household had a comparatively higher risk exposure than other households in the community, was significant and positively related to individual chronic conditions; in model 1c a one standard deviation increase of this variable increased the odds of chronic conditions by 30.8%. Two variables representing SRM strategies showed a significant value. Like in the regression model on general risks, cause and effect in this regression model 1c were not necessarily clear, concerning these variables. In this case, it seemed to be more likely that the household variables of the *use of savings* and the *share of household members contributing to the household income* were a result of individuals with chronic diseases in the household.[618]

Tab. 24: Determinants of individual chronic diseases (multivariate logistic regression)

	Model 1a	Model 1b	Model 1c
Country Malawi (base: Ghana)[c]	0.0206 (0.1429)	0.000043 (0.14816)	0.0580 (0.2137)
Household environment: semi-urban (base:rural)[c]	0.131 (0.1718)	0.172 (0.1731)	0.153 (0.1743)
Household environment: urban (base:rural)[c]	0.179 (0.1421)	0.175 (0.1434)	0.217 (0.1464)
Sex of individual: Female (base: male)[c]	0.492*** (0.1199)	0.487*** (0.1202)	0.476*** (0.1206)
Education level of individual	−0.111 (0.0737)	−0.0876 (0.0741)	−0.130* (0.0756)
Age of individual: Age group 0-4 years (base: 5-15 years)	0.150 (0.2351)	0.167 (0.2355)	0.127 (0.2364)
Age of individual: Age group 16-54 years (base: 5-15 years)	0.691*** (0.1606)	0.703*** (0.1607)	0.692*** (0.1614)

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[618] An increase of the variable of "Share of hh members contributing significantly to the income" was associated with a 22.5% increase in the odds of chronic conditions. A household using savings was associated with an increase in the odds of chronic conditions by 65.2%.

Age of individual: Age group 55+ years (base: 5-15 years)	2.217*** (0.2073)	2.241*** (0.2082)	2.190*** (0.2108)
Predominant religion: Muslim[c] (base: Christian)	−0.102 (0.1564)	−0.147 (0.1661)	−0.117 (0.1745)
Predominant religion: Other[c] (base: Christian)	−0.529 (0.4750)	−0.562 (0.4778)	−0.554 (0.4812)
Child/adult ratio[z]	0.00413 (0.0633)	0.00380 (0.0639)	0.0589 (0.0669)
Wealth index: 1st quintile (base: 3rd quintile)	0.227 (0.2087)	0.163 (0.2106)	0.188 (0.2150)
Wealth index: 2nd quintile (base: 3rd quintile)	0.0624 (0.2052)	0.0333 (0.2068)	0.0513 (0.2079)
Wealth index: 4th quintile (base: 3rd quintile)	0.516*** (0.1937)	0.531*** (0.1953)	0.594*** (0.1986)
Wealth index: 5th quintile (base: 3rd quintile)	0.537*** (0.2083)	0.576*** (0.2103)	0.575*** (0.2139)
Total monthly hh income (quintiles)	0.0362 (0.0460)	0.0337 (0.0462)	−0.00338 (0.0489)
General risks exposure[z]		0.00401 (0.0295)	−0.00615 (0.0306)
Travel time to closest hospital >= 3hrs[b]		0.00478 (0.0545)	0.0104 (0.0508)
Travel time to closest primary facility > 1h[b]		0.00665 (0.0048)	0.00586 (0.0048)
Type of primary health care facility: private (base: public or charitable)[c]		−0.235 (0.1711)	−0.255 (0.1732)
Satisfaction with quality of care[l,z]		−0.0487 (0.0516)	−0.0699 (0.0527)
General risk exposure compared to other households[l,z]		0.210*** (0.0537)	0.247*** (0.0548)
Share of hh members contributing significantly to the income[z]			1.195*** (0.3349)
Income diversification			−0.0652 (0.0955)
Acknowledgment of insurance as risk management tool[b]			0.233 (0.1430)
Individual with health insurance[b]			0.150 (0.1902)
Membership in microfinance[b]			0.245 (0.1529)
Household use of credit/loans[b]			0.0718 (0.1311)
Household use of savings[b]			0.502*** (0.1320)
Decision-making role in associations[b]			0.0899 (0.1358)
Activity level in associations			−0.277 (0.2715)
Likelihood of community assistance[l,z]			−0.0378 (0.0448)
Constant	−4.166*** (0.3030)	−4.085*** (0.3064)	−4.408*** (0.3595)
Observations	7082	7082	7082

| Pseudo R^2 | 0.063 | 0.070 | 0.085 |

Standard errors in parentheses. * *p < 0.10,* ** *p < 0.05,* *** *p < 0.01*
Dependent variable: Individual with chronic or permanent illness (binary)
Notes: ^{b}*=binary/dichotomous variable,* ^{c}*=categorical variable,* ^{l}*= likert scale,* ^{q}*= quintiles,* ^{z}*= centered variable*

Model 1c, split by countries (table 25), again showed that determinants of individual chronic conditions significantly differed between Ghana and Malawi.[619] Compared to the general model 1c, the adj. pseudo R² increased to 9.10% (14.48%) in the Ghana-specific model, but decreased to 2.60% (7.11%) in the Malawi model. Consistent with the general model 1c, the following variables remained significant in both country-specific regression models: the two highest age groups, the 4th and 5th wealth quintiles, the *subjective risk experience compared to other households in the community* and the *use of savings.*[620] Female individuals showed a highly significant relationship with chronic conditions in Malawi, which increased the odds by 86.2%, but stayed insignificant in Ghana. Similarly, a significant negative effect of the educational level on individual chronic conditions was observed only in the Malawi model; a one unit higher educational level decreased the odds of chronic conditions by 26.4%. As in the general model 1c, Ghana and Malawi both showed a significant positive relationship of self-perceived relative household risk exposure with individual chronic conditions (see section 7.2).[621,622] In Malawi, individuals who lived a greater distant from the next hospital (>= 3hrs) showed a significant relationship with chronic diseases: their odds for chronic diseases increased by 46.5%. In Ghana, where health insurance was accessible to a large share of society through the NHIS, individuals in those households who acknowledged health insurance as a tool to pay for expensive health care costs, showed a significant increase (by 57.1%) in odds of having a chronic condition, which may be attributed to either adverse selection or better diagnosis among NHIS members.

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[619] Ghana model specification: LR-χ^2(31)=172.04, p<0.001. Count R²=0.953. Malawi model specification: LR-χ^2(31)=100.38, p<0.001. Count R²=0.957.

[620] If the individual belonged to the age group 15-54, the odds for chronic conditions increased by 139.0% in Ghana and 79.1% in Malawi. In the age group 55+, the odds increased by 1310.3% in Ghana and 277.1% in Malawi. The use of savings increased the odds of chronic conditions by 110.2% in Ghana and by 43.6% in Malawi.

[621] An increase of one standard deviation in the subjective general risk exposure of the household increased the odds of chronic conditions by 28.5% in both countries.

[622] The factor *general risk exposure* which was insignificant in the general models 1a-1c, but a 1 SD increase showed inconsistent significant effects in Ghana (17.4% decrease in the odds) and Malawi (14.9% increase in the odds of chronic conditions).

Tab. 25: Determinants of individual chronic diseases: Country comparison (multivariate logistic regression)

	Ghana		Malawi	
Household environment: semi-urban (base:rural)[c]	−0.325	(0.3725)	0.395[*]	(0.2163)
Household environment: urban (base:rural)[c]	0.291	(0.2135)	0.257	(0.2072)
Sex of individual: Female (base: male)[c]	0.270	(0.1817)	0.622[***]	(0.1651)
Education level of individual	0.0388	(0.1066)	−0.306[***]	(0.1084)
Age of individual: Age group 0-4 years (base: 5-15 years)	0.0382	(0.3992)	0.199	(0.2964)
Age of individual: Age group 16-54 years (base: 5-15 years)	0.871[***]	(0.2742)	0.583[***]	(0.2023)
Age of individual: Age group 55+ years (base: 5-15 years)	2.646[***]	(0.3081)	1.563[***]	(0.3484)
Predominant religion: Muslim[c] (base: Christian)	−0.00790	(0.2397)	−0.120	(0.3317)
Predominant religion: Other[c] (base: Christian)	−0.00442	(0.6573)	−0.996	(0.7425)
Child/adult ratio[z]	0.0722	(0.1226)	0.0138	(0.0842)
Wealth index: 1st quintile (base: 3rd quintile)	0.410	(0.3276)	0.00859	(0.3003)
Wealth index: 2nd quintile (base: 3rd quintile)	0.130	(0.3214)	0.0412	(0.2800)
Wealth index: 4th quintile (base: 3rd quintile)	1.073[***]	(0.3016)	0.229	(0.2836)
Wealth index: 5th quintile (base: 3rd quintile)	0.353	(0.3545)	0.720[**]	(0.2797)
Total monthly hh income (quintiles)	−0.0663	(0.0703)	0.0864	(0.0714)
General risks exposure[z]	−0.0835[*]	(0.0474)	0.0721[*]	(0.0432)
Travel time to closest hospital >= 3hrs[b]	−0.0237	(0.1596)	0.382[*]	(0.2210)
Travel time to closest primary facility > 1h[b]	0.00281	(0.0049)	−0.199	(0.1990)
Type of primary health care facility: private (base: public or charitable)[c]	−0.0683	(0.2922)	−0.347	(0.2285)
Satisfaction with quality of care[l,z]	−0.0125	(0.1030)	−0.0890	(0.0640)
General self-perceived risk exposure compared to other households[l,z]	0.273[**]	(0.1061)	0.209[***]	(0.0666)
Share of hh members contributing significantly to the income[z]	1.517[***]	(0.4683)	0.741	(0.5325)
Income diversification	−0.0771	(0.1398)	−0.0225	(0.1428)
Acknowledgment of insurance as SRM tool[b]	0.452[**]	(0.2141)	0.0682	(0.1965)
Individual with health insurance[b]	0.128	(0.2166)	−0.365	(0.7447)
Membership in microfinance[b]	0.145	(0.2558)	0.236	(0.2177)
Household use of credit/loans[b]	0.166	(0.1967)	0.175	(0.1931)
Household use of savings[b]	0.743[***]	(0.2237)	0.362[**]	(0.1707)
Decision-making role in associations[b]	0.260	(0.1961)	−0.153	(0.1973)

Activity level in associations	0.341	(0.4067)	−0.571	(0.4111)
Likelihood of community assistance[l,z]	−0.00705	(0.0796)	−0.0818	(0.0565)
Constant	−5.243***	(0.5560)	−3.877***	(0.4773)
Observations	3085		3997	
Pseudo R^2	0.145		0.071	

Standard errors in parentheses. * *p < 0.10,* ** *p < 0.05,* *** *p < 0.01. Dependent variable: Individual with chronic or permanent illness (binary). Notes: * [b]*=binary/dichotomous variable,* [c]*=categorical variable,* [l]*= likert scale,* [q]*= quintiles,* [z]*= centered variable*

Hospitalization events in the 24 months prior to the survey were reported by 4.57% of individuals (5.41% in Ghana and 3.92% in Malawi). In this study, hospitalization was defined as an inpatient stay with at least one night at the hospital, excluding hospital stays due to maternity events. As discussed in section 2.3.2, particularly long hospitalization stays have been found to be a good predictor of higher future health care costs. Therefore, longer hospitalization stays requiring more than three days at the hospital were analyzed further in detail. Such longer hospitalization stays were reported by 3.08% of individuals in the sample, whereas reporting of longer inpatient stays in Ghana (4.05%) was over one third more than in Malawi (2.33%) (χ^2(1)= 17.33, p<0.001). This was likely a result of the availability of health care providers and health staff; although Malawi with 11 hospital beds per 10 000 population (in the year 2007), had better availability of health care facilities than Ghana, with 9 beds (in the year 2009); medical staff was heavily constrained in Malawi, which only had one fourth of the physician density per 10 000 population (0.019, year 2009) compared to Ghana (0.085, year 2009); Malawi also had only one third of the nursing and midwifery personnel per 1000 population (Malawi 0.343, Ghana 1.046, both in the year 2009), but five times as many other, often low skilled, health workers per 1000 population (Malawi 0.138 (year 2009), Ghana 0.026 (year 2008)).[623]

Similar to chronic conditions, the occurrence of longer hospitalization events depended heavily upon the age of the individuals (figure 11). Individuals in the oldest age group reported the most hospitalizations with 6.69%, followed by small children between 0-4 years (4.42%). The two middle age groups showed the lowest likelihood for longer hospitalization stays, with 1.93% in the 5-15 years cohort and 3.08% in the 16-54 years cohort (χ^2(3)= 31.31, p<0.001). Consistently in each age group, individuals in Ghana were more likely to report longer hospitalizations than in Malawi. However,

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[623] World Health Organization (WHO) (2014): World Health Statistics. Health Workforce. Data by country.; World Health Organization (WHO) (2014): Health systems: Essential health technologies - Data by country. URL: http://apps.who.int/gho/data/node.main.70?lang=en (accessed 2014/05/25).

this country difference was only statistically significant for the age groups 16-54 ($\chi^2(1)$= 12.66, p<0.001) and 55+ years ($\chi^2(1)$= 3.42, p<0.1).

Fig. 11: Percentage of individuals reporting hospitalization (> 3 days) by age group
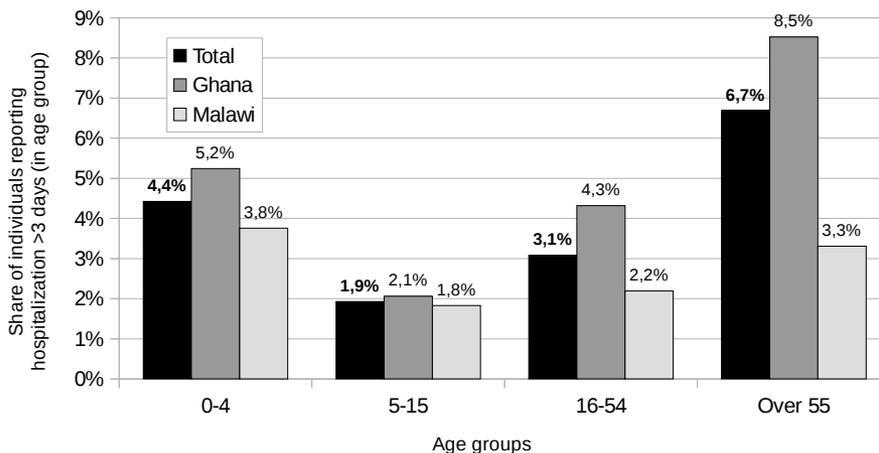
Source: Individual data, Pro MHI Africa dataset.

By analogy with the analysis of individual chronic conditions, the determinants of long hospitalization stays were also analyzed using five regression models. In comparison, the general three models 1a-1c and the Ghanaian model showed a lower explained variance (McFadden Pseudo R^2) compared to the models for individual chronic conditions,[624] which indicated that the occurrence of longer hospitalization stays were less explainable by the available factors and more likely randomly distributed than the occurrence of chronic conditions.[625] For the regression models 1a-1c, no significant levels of collinearity were detected, so that no further adjustments had to be made. However, in the Ghana-specific regression model, the variable *region* showed a high level of collinearity with other variables (i.e. religion and health facility variables). Hence, it was decided to drop the regional distinction from both country-specific regression models.

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[624] Model specification 1a: LR-$\chi^2(16)$=57.16, p<0.001. Count R^2=0.969, Adj. Pseudo R^2=0.012 (0.029). Model specification 1b: LR-$\chi^2(22)$=63.24, p<0.001. Count R^2=0.969, Adj. Pseudo R^2=0.009 (0.032). Model specification 1c: LR-$\chi^2(32)$=150.10, p<0.001. Count R^2=0.969, Adj. Pseudo R^2=0.043 (0.077).

[625] The explained variance in the Malawi model was slightly higher for long hospitalization stays compared to individual chronic conditions.

In the general models 1a-1c (table 26), relatively few factors showed a significant relationship with long hospitalization stays. Households in Malawi experienced fewer long hospitalization stays compared to Ghana; this finding was significant in model 1a and 1b, where the odds of long hospitalization stays were reduced by 37.1% and 34.7%, respectively, but lost significance in model 1c. Consistently over the three models, women experienced a higher likelihood of facing long hospitalization stays, with the odds increased by 29.5% in model 1c.[626] The age group 5-15 years had the least hospitalization events. In all three models, the higher age groups showed a highly significant increase in long hospitalization events, while the relationship of the oldest age group, 55+ years, was the highest with a 266.8% increase in the odds in model 1c.[627] In these three models, wealth had no significant relationship with long hospitalization stays, but higher income significantly increased the occurrence of long hospitalization stays in model 1a and 1b,[628] which might have been an indicator of low accessibility to inpatient services for low-income households. This finding was in line with the factor of health insurance membership of the individual which showed a significant positive relationship with hospitalization stays, which referred to an increase in odds by 72.1% in model 1c. This was another indication that the NHIS seemed able to improve access to inpatient services. Other SRM strategies also resulted in a significant increase in long hospitalization stays, which was a *decision-making role in community associations* (increase of 33.1% in odds of the dependent variable), the *use of savings* (increase of 295.1% in odds) and *use of credit/loans* (increase of 58.1% in odds). The latter two were again unclear regarding the direction of the relationship, as they could have been the result of high costs incurred through long hospitalization stays.

Tab. 26: Determinants of long hospitalization stays (multivariate logistic regression)

	Model 1a	Model 1b	Model 1c
Country Malawi (base: Ghana)^c	−0.464*** (0.1722)	−0.426** (0.1813)	−0.0182 (0.2599)
Household environment: semi-urban (base:rural)^c	0.156 (0.2004)	0.141 (0.2020)	0.190 (0.2068)
Household environment: urban (base:rural)^c	−0.0749 (0.1746)	−0.104 (0.1757)	−0.0201 (0.1812)
Sex of individual: Female (base: male)^c	0.271* (0.1397)	0.270* (0.1398)	0.259* (0.1409)
Education level of individual	0.0976 (0.0858)	0.112 (0.0864)	0.0839 (0.0887)

[626] The hospitalization events excluded explicit maternity-related hospitalization stays, which were recorded in a separate section of the questionnaire.

[627] In model 1c, belonging to the age group 0-4 it increased the odds of long hospitalization stays by 128.7%, in the age group 16-54 by 67.8%.

[628] One standard deviation increase in income quintiles increased the odds of long hospitalization stays in model 1a by 14.9% and in model 1b by 15.1%.

Age of individual: Age group 0-4 years (base: 5-15 years)	0.865***	(0.2168)	0.860*** (0.2170)	0.827***	(0.2188)
Age of individual: Age group 16-54 years (base: 5-15 years)	0.517***	(0.1871)	0.516*** (0.1871)	0.518***	(0.1882)
Age of individual: Age group 55+ years (base: 5-15 years)	1.274***	(0.2757)	1.261*** (0.2762)	1.300***	(0.2803)
Predominant religion: Muslim[c] (base: Christian)	0.309*	(0.1731)	0.204 (0.1879)	−0.0421	(0.2010)
Predominant religion: Other[c] (base: Christian)	0.318	(0.4350)	0.292 (0.4385)	0.201	(0.4458)
Child/adult ratio[z]	0.0445	(0.0695)	0.0358 (0.0700)	0.0459	(0.0737)
Wealth index: 1st quintile (base: 3rd quintile)	−0.186	(0.2269)	−0.193 (0.2287)	−0.0847	(0.2369)
Wealth index: 2nd quintile (base: 3rd quintile)	−0.0775	(0.2097)	−0.0866 (0.2108)	−0.0195	(0.2129)
Wealth index: 4th quintile (base: 3rd quintile)	−0.375	(0.2293)	−0.347 (0.2300)	−0.213	(0.2340)
Wealth index: 5th quintile (base: 3rd quintile)	−0.230	(0.2387)	−0.218 (0.2411)	−0.154	(0.2458)
Total monthly hh income (quintiles)	0.0984*	(0.0534)	0.0995* (0.0536)	0.0214	(0.0567)
General risks exposure[z]			0.0385 (0.0329)	0.00736	(0.0340)
Travel time to closest hospital >= 3hrs[b]			−0.115 (0.2555)	−0.120	(0.2600)
Travel time to closest primary facility > 1h[b]			−0.238 (0.2151)	−0.286	(0.2180)
Type of primary health care facility: private (base: public or charitable)[c]			−0.145 (0.2107)	−0.231	(0.2142)
Satisfaction with quality of care[l,z]			0.0499 (0.0683)	−0.0188	(0.0697)
General risk exposure compared to other households[l,z]			0.0626 (0.0677)	0.0494	(0.0698)
Share of hh members contributing significantly to the income[z]				0.687	(0.4446)
Income diversification				−0.0111	(0.1119)
Acknowledgment of insurance as risk management tool[b]				0.0109	(0.1679)
Individual with health insurance[b]				0.543**	(0.2140)
Membership in microfinance[b]				−0.212	(0.1874)
Household use of credit/loans[b]				0.458***	(0.1575)
Household use of savings[b]				1.374***	(0.1992)
Decision-making role in associations[b]				0.286*	(0.1571)

Activity level in associations				−0.0473	(0.2990)
Likelihood of community assistance[l,z]				0.0259	(0.0625)
Constant	−4.335***	(0.3410)	−4.305*** (0.3452)	−5.630***	(0.4380)
Observations	7082		7082	7082	
Pseudo R^2	0.029		0.032	0.077	

*Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01*
Dependent variable: Hospitalization longer than three days (binary)
Notes: ᵇ=binary/dichotomous variable, ᶜ=categorical variable, ˡ= likert scale, �q= quintiles, ᶻ= centered variable

Regression model 1c, split by country (table 27), again showed some interesting differences between Ghana and Malawi.[629] The only variable which was consistent with the general models 1a-1c was the relationship of *household use of savings* with long hospitalization stays.[630] On the other hand, women only had a significant positive relationship (base: male) in Malawi, referring to an increase of odds by 71.2%. Age was inconsistent: As expected, both countries showed a higher occurrence of long hospitalization stays among the youngest age group (0-4 years),[631] but the older age groups (15-54 and 55+) only showed a significant positive relationship in Ghana, not in Malawi.[632] This is an unexpected finding, because this relationship was consistent in the literature (cp. section 2.3.2). The relationship of the level of household income did not show significant levels in any country. Also, the different wealth quintiles did not show consistent results in the country-specific models.

A result of the country comparison indicated that individual and household level SRM strategies played a larger role in Ghana compared to Malawi: Evidently, access to health insurance was greater in Ghana and, hence, health insurance membership of the individual showed a significant positive relationship with long hospitalizations stays, increasing the odds by 61.7%. Health insurance in Malawi, which played a minor role, did not show a significant relationship. In Ghana, the *use of credit/loans* (resulting in an increase in odds by 79.1%) and the involvement of a higher *share of household members significantly contributing to the hh income* (a one sd higher level increases the odds by 22.5%) as well as having a *decision-making role in community associations* (increase in

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[629] Model specification Ghana: LR-χ²(31)=108.50, p<0.001. Count R²=0.959, Adj. Pseudo R²=0.043 (0.104).
Model specification Malawi: LR-χ²(31)=74.61, p<0.001. Count R²=0.977, Adj. Pseudo R²=0.012 (0.084).

[630] The use of savings was associated with an increase of odds in long hospitalization stays of 345.9% in Ghana and 260.5% in Malawi.

[631] Belonging to the age group 0-4 increased the odds of long hospitalizations stays by 158.4% in Ghana and 99.3% in Malawi.

[632] In Ghana, the age group 16-54 indicated an increase in odds of 98.2% in long hospitalization stays and belonging to the age group 55+ increased the odds by 383.8%.

odds by 50.8%) was significantly associated with long hospitalization stays. These variables pointing at applied SRM strategies remained insignificant in Malawi. Out of the SRM strategies in Malawi, only *household use of savings* was highly significant (leading to an increase in odds by 260.5%), which was also the case in Ghana (increase in odds by 345.9%). The finding that households in Malawi tended to utilize fewer hospitalization stays (models 1a-1b) coupled with the much lower availability of skilled health personnel in Malawi compared to Ghana (section 4.3.6.3), seemed to be related to the inconsistent significant factors in the Malawi model. Few personal and household socio-economic factors or SRM strategy-related factors were related to the use of long hospitalization stays, potentially indicating equitable but restricted access to inpatient services in Malawi.

Tab. 27: Determinants of long hospitalization stays: Country comparison (multivariate logistic regression)

	Ghana		Malawi	
Household environment: semi-urban (base:rural)[c]	0.516	(0.3332)	0.0649	(0.2750)
Household environment: urban (base:rural)[c]	−0.117	(0.2427)	0.0116	(0.2804)
Sex of individual: Female (base: male)[c]	0.0740	(0.1882)	0.538[**]	(0.2186)
Education level of individual	0.0730	(0.1137)	0.0964	(0.1477)
Age of individual: Age group 0-4 years (base: 5-15 years)	0.950[***]	(0.3146)	0.689[**]	(0.3111)
Age of individual: Age group 16-54 years (base: 5-15 years)	0.684[**]	(0.2743)	0.301	(0.2655)
Age of individual: Age group 55+ years (base: 5-15 years)	1.576[***]	(0.3549)	0.912	(0.5768)
Predominant religion: Muslim[c] (base: Christian)	−0.0158	(0.2538)	−0.223	(0.4435)
Predominant religion: Other[c] (base: Christian)	0.332	(0.6522)	−0.225	(0.6487)
Child/adult ratio[z]	0.00591	(0.1263)	0.0360	(0.0935)
Wealth index: 1st quintile (base: 3rd quintile)	−0.263	(0.3130)	0.324	(0.3795)
Wealth index: 2nd quintile (base: 3rd quintile)	−0.619[*]	(0.3169)	0.719[**]	(0.3195)
Wealth index: 4th quintile (base: 3rd quintile)	−0.187	(0.3105)	−0.179	(0.3808)
Wealth index: 5th quintile (base: 3rd quintile)	0.213	(0.3215)	−0.658	(0.4296)
Total monthly hh income (quintiles)	0.107	(0.0767)	−0.0467	(0.0902)

General risks exposure[z]	−0.0113	(0.0478)	0.0824	(0.0530)
Travel time to closest hospital >= 3hrs[b]	−0.933	(0.6076)	0.0530	(0.3007)
Travel time to closest primary facility > 1h[b]	−0.155	(0.3380)	−0.458	(0.3141)
Type of primary health care facility: private (base: public or charitable)[c]	−0.527	(0.3775)	0.0193	(0.2779)
Satisfaction with quality of care[l,z]	0.0374	(0.1209)	−0.0432	(0.0908)
General risk exposure compared to other households[l,z]	0.0161	(0.1147)	0.0520	(0.0950)
Share of hh members contributing significantly to the income[z]	1.078[*]	(0.5533)	−0.610	(0.8742)
Income diversification	−0.119	(0.1464)	0.169	(0.1941)
Acknowledgment of insurance as risk management tool[b]	0.0766	(0.2277)	−0.0636	(0.2560)
Individual with health insurance[b]	0.481[**]	(0.2411)	−0.0712	(1.0488)
Membership in microfinance[b]	−0.318	(0.2809)	0.117	(0.2875)
Household use of credit/loans[b]	0.583[***]	(0.2091)	0.426	(0.2624)
Household use of savings[b]	1.495[***]	(0.3125)	1.282[***]	(0.2670)
Decision-making role in associations[b]	0.411[**]	(0.2044)	0.0946	(0.2725)
Activity level in associations	−0.248	(0.4383)	−0.00522	(0.4557)
Likelihood of community assistance[l,z]	0.113	(0.1024)	−0.0265	(0.0842)
Constant	−5.980[***]	(0.6049)	−5.832[***]	(0.6772)
Observations	3085		3997	
Pseudo R^2	0.104		0.084	

Standard errors in parentheses. [*] *$p < 0.10$,* [**] *$p < 0.05$,* [***] *$p < 0.01$*
Dependent variable: Hospitalization longer than three days (binary)
Notes: [b]*=binary/dichotomous variable,* [c]*=categorical variable,* [l]*= likert scale,* [q]*= quintiles,* [z]*= centered variable*

A variety of analyses were conducted to understand the interdependencies of variables relevant for testing hypothesis H[2a]. The outcomes were also relevant for further high-risk analyses on the household level in subsequent sections. Regarding hypothesis H[2a], it was shown that chronic conditions significantly depended on several personal characteristics that had the potential to predict future high health care utilization. Significantly, a higher prevalence of chronic conditions was found among the oldest age group (55+ years), which was significant in all bivariate and multivariate analyses. Also, the third age group (16-54 years) showed a significant increase in chronic conditions. The increase in total individual health care costs was analog to the prevalence of chronic conditions and, hence, significantly increased with the third (16-54 years) and the highest age group (55+ years). The country of residence itself was not a significant

factor, except for the oldest age group (which was likely an effect of the higher life expectancy in Ghana). Women appeared more likely to have chronic conditions than men, which was significant in all bivariate analyses and in the general multivariate models 1a-1c. The same effect could be confirmed in the Malawi-specific regression model, but not in the Ghana-specific regression model; where the coefficient became insignificant. However, women were shown not to have higher health care costs than men in the same age group, as it was more likely that men accounted for the very costly health care cases. In the general regression models, a higher wealth quintile was positively associated with chronic conditions, a relationship which was weaker and partially significant in the country-specific models.

Generally, long hospitalization stays could not be well explained by the available factors; however, age was a significant factor. Particularly, the highest age group, 55+, had a significant relationship with long hospitalization stays, but the lowest group (0-4 years) also showed increased levels. This was significant in all regression models, except for the coefficient for the oldest age group in the Malawi-specific regression model, where it lost significance. Women tended to have more long hospitalization stays than men, which was confirmed in the general regression models and in the Malawi-specific model, but not in the Ghana model. The country of residence was a less important factor, but showed a significantly higher likelihood for long hospitalization stays in Ghana in model 1a and 1b.

Health insurance membership was a relevant factor in Ghana, where it was significantly related to an increase in longer hospitalization stays, probably an effect of improved access to inpatient care through health insurance. Health insurance did not have a significant relationship with regard to the likelihood of chronic conditions.

Overall, hypothesis H_{2a} was confirmed. The personal characteristics old age and sex of the individual were related to prevalence of chronic conditions and long hospitalization stays. Belonging to the highest age group 55+ years was a highly relevant factor for high health care costs in the sample.

7.3.2.   Individual and household exposure to high health care costs

As discussed in section 2.4.1, and hypothesized in H_{2b}, the distribution of health care costs could be expected to be heavily positively skewed with a concentration of health care costs on relatively few individuals. Generally, such high-cost households and high-cost individuals are vulnerable, as the likelihood is high that SRM strategies on individual- or household level are overburdened by catastrophic health care costs.

Figure 12 shows the concentration curve of total individual health care costs in illness episodes (3 months recall period) in Malawi. The Gini coefficient, a measure of disparity, was very high in Malawi at 0.84, representing a very strong relative concentration of the health care costs. In other words, it showed that the illness costs of the entire group of people facing an illness were concentrated among a few individuals. Only 5.60% of high-cost individuals carried over 50% of the total individual treatment costs of the entire Malawian sample.[633]

Fig. 12: Concentration curve of total individual treatment costs (Malawi)
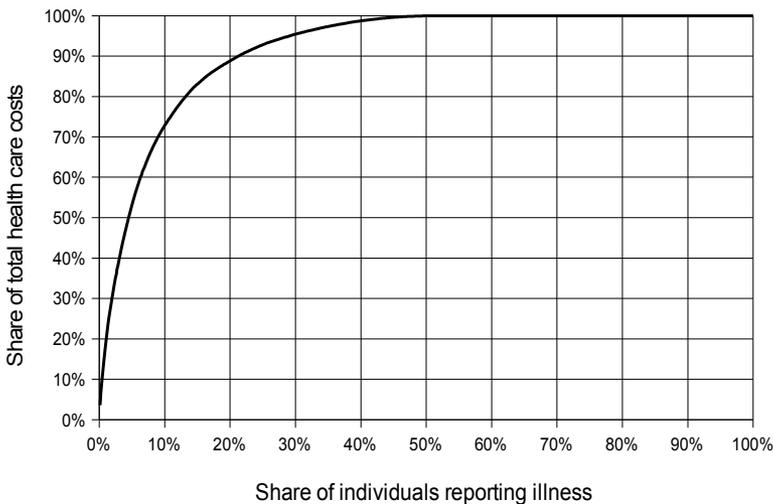
Source: Own calculation. Dataset: Pro MHI Africa, illness episodes, Malawi. N=804 individuals who reported at least one illness episode in the last three months, out of 4000 individuals in the Malawian sample.

In Ghana, the Gini coefficient was even higher at 0.91, showing that the health care costs were more concentrated among fewer individuals than in Malawi. Only 0.9% of individuals carried 50% of the total individual health care costs and 86.92% were carried by the 10% of individuals with the highest costs (out of those having reported an illness episode). Comparing figure 12 and 13 showed that the concentration curve was substantially steeper in Ghana compared to Malawi. However, if the individuals who reported an illness episode in Ghana were separated by those who were insured with the NHIS and those without insurance (figure 13), two clear differences were noticed.

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[633] The 10% of individuals with the highest costs (out of the 804 individuals reporting an illness) comprised 72.9% of aggregated total individual health care costs in Malawi.

Firstly, the concentration curve of the insured individuals was less steep. Secondly, the total share of health care costs borne by the insured individuals was lower (47.5% of total health care costs) than the total health care costs borne by the uninsured households (52.5% of total health care costs). Additionally, the group of insured among the individuals reporting an illness was much larger (400 individuals) than those who were uninsured (148 individuals). After standardizing for the different group sizes, the mean health care costs of the uninsured was almost three times the mean health care costs of the insured: GHS 117.15 (63.35€) versus GHS 39.19 (21.19€). This difference not only stemmed from the individuals experiencing high costs, but also those with low health care costs as the median of the uninsured was more than four times higher than the median of the insured: GHS 12.50 (6.76€) vs. GHS 3 (1.62€).

Fig. 13: Concentration curve of total individual treatment costs (Ghana)
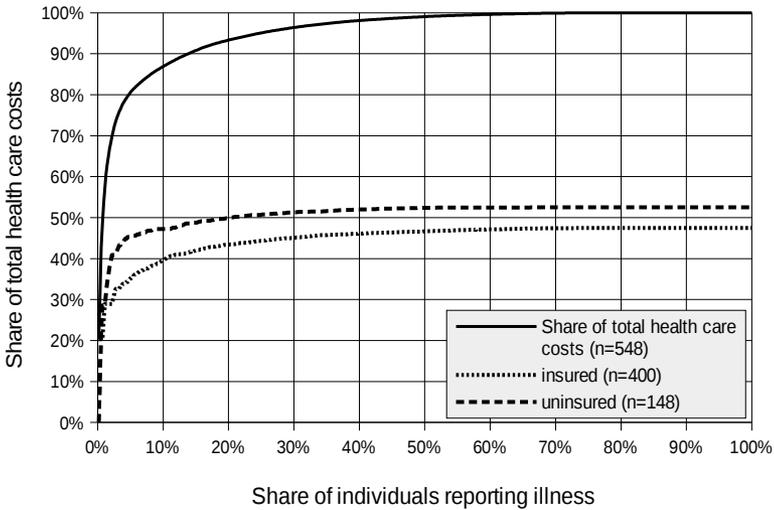
Source: Own calculation. Dataset: Pro MHI Africa, illness episodes, Ghana. N=548 individuals who reported at least one illness episode in the last three months out of 3086 individuals in the Ghanaian sample.

A core-density estimation graph of the distribution of health care costs split by insured and uninsured individuals (figure 14) showed that the density curve of the uninsured was, almost on all expenditure levels, higher than the curve of the insured. An exception of this was the highest cost cases, where 3 out of the 10 most expensive cases were individuals insured at the NHIS, including the single most expensive case.

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These results indicated that the NHIS was able to provide considerable protection from high as well as low/medium health care costs. This partially confirmed hypothesis H_{2c}, that health insurance protected individuals and households from high health care costs. Members of the NHIS were eligible to receive a wide variety of health care for free, which seemed to successfully reduce all levels of health care spending.

Fig. 14: Core-density estimation of health care costs in Ghana
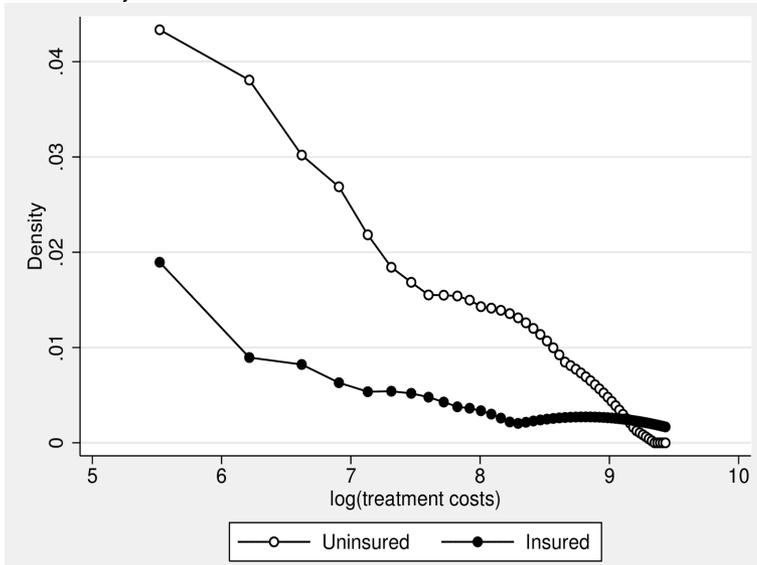
Source: Own calculation. Dataset: Pro MHI Africa, illness episodes, Ghana. N=548 individuals reporting at least one illness episode out of 3086 individuals.

In the next analytical step, the individual direct and indirect health care costs were aggregated on household level. The household was seen as the economic unit dealing with health care costs and one of the main providers of social risk management strategies. Hence, in the multivariate analysis, several factors were tested by using the dichotomous variable of high-cost households as dependent variable: several household-related factors, risk exposure variables and variables representing SRM strategies. The determinants for high-cost households were analyzed in five logistic regression models, three general step-wise regression models 1a-1c and two regression models, split by country. The variable *country* could not be included in the regression models 1a-1c, because the creation of the dependent variable was done independently for each country and then aggregated into one international variable, so that an influence of the

household country was logically eliminated.[634] No significant level of collinearity could be observed in the general models 1a-1c. However, in both country specific regression models, the variable *region* showed a high level of collinearity with other variables (e.g. religion, household environment and health facility variables). Hence, it was decided to drop the variable defining the region from these two regression models.

The general multivariate regression models 1a-1c (table 28) showed that a relatively large share of high-cost households could be estimated by the independent variables, amounting, in model 1c, to 22.3% (Adj. McFadden pseudo R^2).[635] As expected, a variety of household-related variables showed a significant relationship with high health care costs. Consistently over all three general models, the household size and the child/adult ratio were significant and positively associated with high household health care costs. This was not surprising, because the dependent variable represented the household total of direct and indirect health care costs and was not discounted by the number of household members. In model 1c, the odds of being a high-cost household increased by 16.7% with one additional household member (if the increase was by one sd, the odds increased by 44.3%). Similarly, the child/adult ratio was significant, a change by one sd indicated an increase in the odds of being a high cost household by 28.1%. The total monthly household income was significant in models 1a and 1b, but lost significance in model 1c, probably because some SRM strategies also indirectly depended on the income situation of the household. In model 1b, the odds of the dependent variable increased by 24.3% if the household was in an income quintile one level higher.

Model 1b introduced variables on health care access and risk exposure, which substantially increased the adj. McFadden pseudo R^2 from 3.7% (non-adj. 8.0%) to 15.7% (21.7%). A one sd increase in the household-level high-risk variable[636] increased the odds of being a high-cost household in model 1b by 82.1% (one unit change by 1327.8%) and in model 1c by 60.3% (one unit change by 712.4%), while the relationship was highly significant in both models.

High health care costs in the household may have come from one single treatment case, but were more likely the aggregate costs from a number of illness events that ac-

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[634] The share of high-cost households in Ghana was 6.17% (37 hh) and in Malawi 6.16% (51 hh), a comparable share as result of the computation of the variable.

[635] Model specification 1a: LR-χ^2(13)=52.59, p<0.001. Count R^2=0.938, Adj. Pseudo R^2=0.037 (0.080). Model specification 1b: LR-χ^2(19)=143.57, p<0.001. Count R^2=0.939, Adj. Pseudo R^2=0.157 (0.217). Model specification 1c: LR-χ^2(29)=207.07, p<0.001. Count R^2=0.940, Adj. Pseudo R^2=0.223 (0.313).

[636] The household high-risk variable had the values range from 0 to 1 (in total four steps), mean 0.130, sd 0.225, was based on exposure of household members to long hospital stays, chronic conditions and high age of household members. For details, see sections 6.3.

cumulated to a high cost situation. An increase of one sd in the *average illness events per household member*[637] increased the odds of being a high-cost household in model 1b by 125.3% (one unit change by 2739.9%) and in model 1c by 87.9% (one unit change by 1243.8%). Also, the variables related to health care facilities were consistently significant in model 1b and model 1c. If the household normally used a private primary facility, this increased the odds of being a high-cost household by 99.7% in model 1b and 83.0% in model 1c. The distance to the closest hospital[638] also had a significant influence on the dependent variable, one category further from the closest hospital increased the odds of being a high-cost household by 40.2% in model 1b and 41.8% in model 1c. The self-perceived relative exposure to general risks and the number of general risks exposed did not have a significant relationship with the dependent variable.

Tab. 28: Determinants of high cost households (multivariate logistic regression)

	Model 1a	Model 1b	Model 1c
Household environment: semi-urban (base:rural)[c]	0.521[*] (0.2945)	0.383 (0.3144)	0.417 (0.3408)
Household environment: urban (base:rural)[c]	0.201 (0.2792)	0.363 (0.3173)	0.392 (0.3410)
Education level of head of household	0.0177 (0.1422)	0.0123 (0.1490)	−0.0489 (0.1657)
Household size[z]	0.167[***] (0.0501)	0.248[***] (0.0564)	0.154[**] (0.0731)
Age of head of household[z]	0.0221[**] (0.0096)	0.00321 (0.0106)	0.0144 (0.0111)
Predominant religion: Muslim[c] (base: Christian)	−0.173 (0.2949)	−0.220 (0.3342)	−0.228 (0.3819)
Predominant religion: Other[c] (base: Christian)	0.0614 (0.7639)	0.397 (0.8305)	0.339 (0.8608)
Child/adult ratio[z]	0.214[**] (0.1011)	0.209[*] (0.1106)	0.246[**] (0.1213)
Wealth index: 1st quintile (base: 3rd quintile)	−0.585 (0.4249)	−0.583 (0.4548)	−0.569 (0.4815)
Wealth index: 2nd quintile (base: 3rd quintile)	0.321 (0.3276)	0.363 (0.3512)	0.338 (0.3710)
Wealth index: 4th quintile (base: 3rd quintile)	−0.0946 (0.3530)	−0.0917 (0.3828)	0.132 (0.4069)
Wealth index: 5th quintile (base: 3rd quintile)	−0.465 (0.4016)	−0.419 (0.4312)	−0.181 (0.4621)
Total monthly hh income (quintiles)	0.208[**] (0.0901)	0.217[**] (0.0970)	0.0552 (0.1075)

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[637] The variable average illness events per household member had a value range from 0 to1, mean 0.207 and sd 0.243 (for the inclusion into the regression models, the variable had been centered which did not alter the standard deviation).

[638] The variable was classified in five distance classes. For details see section 6.3.

	Model 1	Model 2	Model 3
Type of primary health care facility: private (base: public or charitable)[c]		0.692** (0.3068)	0.604* (0.3271)
Distance to the closest hospital		0.338*** (0.1286)	0.350** (0.1383)
High risk household		2.659*** (0.4716)	2.095*** (0.4954)
Average illness events per hh member[z]		3.346*** (0.4895)	2.598*** (0.5804)
General risks exposure[z]		−0.0023 (0.0571)	−0.0346 (0.0603)
General risk exposure compared to other households[l,z]		0.0592 (0.1133)	0.110 (0.1217)
Income diversification			0.393* (0.2024)
Share of hh members contributing significantly to the income[z]			−0.421 (0.9702)
Acknowledgment of insurance as risk management tool[b]			0.0364 (0.2984)
Household with health insurance[b]			−0.636* (0.3495)
Membership in microfinance[b]			0.00438 (0.3277)
Household use of credit/loans[b]			0.953*** (0.3114)
Household use of savings[b]			2.339*** (0.5409)
Decision-making role in associations[b]			0.235 (0.2972)
Activity level in associations			0.710 (0.4366)
Likelihood of community assistance[l,z]			0.0463 (0.1090)
Constant	−3.626*** (0.4958)	−5.376*** (0.6816)	−7.828*** (0.9544)
Observations	1428	1428	1428
Pseudo R^2	0.080	0.217	0.313

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Dependent variable: High-cost household (binary, 1sd higher than mean of log total hh health care costs)

Notes: [b]=binary/dichotomous variable, [c]=categorical variable, [l]= likert scale, [q]= quintiles, [z]= centered variable

Model 1c, that adds variables on SRM strategies to the model, increased the explanatory power of the regression models to an adj. McFadden pseudo R^2 of 22.3% (non-adj. 31.3%). Again, the causal relationship of these variables needs to be taken with a grain of salt. On the other hand, the SRM strategy *health insurance* was a factor that was able to reduce the amount of health care costs that had to be paid by the household. As expected, the general model 1c showed a negative relationship with high cost households: A household insured for health reduced the odds of being a high-cost household by 47.1%. In the general model 1c, three other SRM strategies had a significant positive relationship with the high-cost household variable: An increase in *income diversification*[639] by one sd increased the odds of high-costs of the household by 30.7% (one unit

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[639] Income diversification was measured in 4 categories on a scale from 0 to 3, mean 1.357, sd 0.682.

increase by 48.1%). The household *use of savings* was highly significant and related to an increase in odds by 936.6% and the *use of credit/loans* was related to an increase in odds by 159.3%, which was highly significant.

As for the regression models in previous sections, model 1c was also estimated separately for each country (table 29).[640] The explanatory power of the regression models was comparable, but differences between the relevant factors in Ghana and Malawi could be observed. The variables on general household characteristics were inconsistent in both country-specific regression models, with the general models 1a-1c: Household size and the child/adult ratio was significant only in the case of Ghana; they were positively associated with high cost households and an increase of the household size by one household member increased the odds by 21.6% (increase of one sd by 70.7%) and an increase of the child/adult ratio by one sd increased the odds by 90.7%. The semi-urban household environment, which was significant in model 1c, was highly significant in Ghana, leading to an increase in odds by 577.7%, but it was not significant in Malawi.

Consistent with the general models, the variable *high-risk household* was highly significant in both countries: an increase by one standard deviation increased the odds by 75.0% (one unit increase by 760.8%) in Ghana and by 42.0% in Malawi (one unit increase by 1034.7%). Also, the *average number of illness events* per household member was significantly positively related to high cost households: an increase by one sd increased the odds by 213.7% in Ghana, but just 42.0% in Malawi. These results, together with the bivariate discussion in section 6.3 on the computation of the high-risk household variables, showed that 17.50% of high-risk households also belonged to the high cost households, while only 5.12% of low/medium risk households could be categorized as high-cost households. Hence, high-risk households were more than three times more likely to incur high health care costs than other households.

With regard to the variables representing SRM strategies, the *use of savings* remained significant in both countries, leading to an increase in odds by 299.1% in Ghana and by 2015.3% in Malawi. The use of credit remained significant only in Ghana and increased the odds by 397.6%, but lost significance in Malawi. This could have been an artifact, mirroring the fact that the partner organizations in Malawi were microfinance institutions, so that members had access to credit for a variety of purposes.

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[640] Model specification Ghana: LR-χ^2(29)=102.93, p<0.001. Count R^2=0.950, Adj. Pseudo R^2=0.155 (0.371).
Model specification Malawi: LR-χ^2(29)=136.76, p<0.001. Count R^2=0.943, Adj. Pseudo R^2=0.200 (0.357).

Health insurance was significant only in Ghana and decreased the odds by 64.6%. Income diversification lost significance in both countries.

Tab. 29: Determinants of high cost households: Country comparison (multivariate logistic regression)

	Ghana		Malawi	
Household environment: semi-urban (base:rural)[c]	1.914[***]	(0.6759)	0.157	(0.4642)
Household environment: urban (base:rural)[c]	0.604	(0.6261)	0.343	(0.4603)
Education level of head of household	−0.0138	(0.2562)	−0.191	(0.2549)
Household size[z]	0.196[*]	(0.1188)	0.158	(0.1173)
Age of head of household[z]	0.0233	(0.0168)	0.00990	(0.0183)
Predominant religion: Muslim[c] (base: Christian)	−0.625	(0.5899)	0.0779	(0.6466)
Predominant religion: Other[c] (base: Christian)	1.257	(1.2745)	−0.133	(1.2463)
Child/adult ratio[z]	0.689[***]	(0.2390)	0.0269	(0.1627)
Wealth index: 1st quintile (base: 3rd quintile)	−0.512	(0.7767)	−0.0653	(0.6993)
Wealth index: 2nd quintile (base: 3rd quintile)	0.546	(0.6399)	0.698	(0.5318)
Wealth index: 4th quintile (base: 3rd quintile)	0.449	(0.6790)	0.328	(0.5642)
Wealth index: 5th quintile (base: 3rd quintile)	0.749	(0.7946)	−0.692	(0.6331)
Total monthly hh income (quintiles)	−0.164	(0.1736)	0.240	(0.1554)
Type of primary health care facility: private (base: public or charitable)[c]	−0.338	(0.7412)	0.656	(0.4144)
Distance to the closest hospital	0.421	(0.2624)	0.156	(0.1895)
High risk household	2.153[***]	(0.8096)	2.429[***]	(0.7560)
Average illness events per hh member[z]	4.637[***]	(1.0290)	1.460[*]	(0.8356)
General risks exposure[z]	−0.0675	(0.1041)	−0.0369	(0.0896)
General risk exposure compared to other households[l,z]	0.0558	(0.2394)	0.205	(0.1517)
Income diversification	0.414	(0.3365)	0.281	(0.2998)
Share of hh members contributing significantly to the income[z]	−1.010	(1.5239)	−0.109	(1.6279)
Acknowledgment of insurance as SRM tool[b]	−0.0183	(0.5147)	−0.00289	(0.4385)
Household with health insurance[b]	−1.039[**]	(0.5074)	0.883	(0.9096)
Membership in microfinance[b]	−0.566	(0.6499)	0.381	(0.5199)
Household use of credit/loans[b]	1.605[***]	(0.5324)	0.601	(0.4690)
Household use of savings[b]	1.384[*]	(0.8054)	3.052[***]	(0.7834)
Decision-making role in associations[b]	0.592	(0.4591)	0.229	(0.4818)
Activity level in associations	0.780	(0.7983)	0.354	(0.6213)

Likelihood of community assistance[l,z]	−0.0969	(0.1792)	0.278	(0.1740)
Constant	−7.279***	(1.5825)	−8.443***	(1.3671)
Observations	600		828	
Pseudo R^2	0.370		0.357	

Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01
Dependent variable: High-cost household (binary, 1sd higher than mean of log total hh health care costs)
Notes: [b]=binary/dichotomous variable, [c]=categorical variable, [l]= likert scale, [q]= quintiles, [z]= centered variable

The analyses in this section refer to three sub-hypotheses of H2: H_{2b}, H_{2c} and H_{2d}. Analyses in both countries showed that health care costs were heavily right skewed and only a small percentage of individuals carried the largest share of health care costs of the entire country-sample. Therefore, hypothesis H_{2b} was confirmed. The concentration of health care costs – in both countries using real data – by far surpassed the hypothesized concentration of health care costs, based on the literature review in section 2.4.

Hypothesis H_{2c} stated that the financial protection mechanism health insurance, which is based on risk-pooling, resulted in a lower likelihood of insured households incurring high health care costs. In the bivariate analysis, the concentration curve of individual health care costs in Ghana, and also the multivariate regression models 1c and the Ghana-specific model, confirmed that households with health insurance were less likely to experience high health care costs than uninsured households.

The results of the relationship of high risk households and high cost households confirmed hypothesis H_{2d} showing that the likelihood of facing high health care costs by high risk households was more than three times as high as for low/medium risk households.

Additionally, it was somewhat surprising that wealth and income quintiles of households had no significant relationship to high cost households in model 1c and the country-specific models, which indicated that high health care costs occurred out of need for health care and were partially the result of patients' lack of negotiation power in the market for health services coupled with high willingness to pay in times of illness.

7.4. Application of social (health) risk management strategies

The literature review in section 4 showed evidence of numerous SRM strategies that were applied on the individual, household and community-levels in Sub-Saharan Africa. The empirical analysis of the application of SRM strategies incorporated some previously discussed SRM strategies and followed three steps. The first one analyzed

the complexity of SRM strategy sets, looking at the aggregated number of strategies applied by households. The second one looked at the use of single SRM strategies by households without considering which other strategies were used. It was briefly shown which strategies households usually coupled and frequently applied in combination. The third step was the most complex, looking at all SRM strategy sets most frequently used by households. In all three steps, univariate and bivariate statistical methods were used. In a final step, multivariate OLS regression models, on the complexity of SRM strategy sets, were estimated in order to identify the significant factors explaining SRM strategy use.

Households used a wide variety of mechanisms which were directly, or only indirectly, used for the purpose of risk management. For example, if a household took out a loan, it could have been for investment or risk management purposes. In the data set used, the purpose of the application of these mechanisms was not always clear. In some instances, the purpose was specified, as the household indicated that it paid health care expenditures and specified a 'loan' as the source of the money. As low-income households often pooled money from different sources, these variables were treated as purpose-agnostic in analysis, meaning that, for example, any loan taken was considered a risk management strategy, even without a specified purpose. Furthermore, due to the use of cross-sectional data, the causal relationship could not always be extracted. For example, income diversification could be a proactive strategy to reduce income fluctuations, but it could also be the result of shocks, when a household needed to engage in different, non-specialized and low-return activities, in order to make its living and to relieve the impact of the shock. Independently, whether a strategy was directly or indirectly set for the purpose of SRM, households tended to maintain SRM strategy sets over a longer period, even if there was no acute need to react to a shock.

Table 30 gives an overview of the SRM strategies that were considered for the calculation of complexity of SRM strategies. The SRM strategies fell into the categories of (micro-)financial services, income-diversification mechanisms and measures of social capital (density, frequency of interactions and value of networks). The household's assets were analyzed separately, because pure asset-holding is also a measure for wealth, which – like household income – influences the access to almost every other SRM strategy.

Tab. 30: Social risk management strategies used for the analysis

SRM classification	Variable	Type of variable(s)/variants
(Micro-) Financial services	Credit/loan/borrowing use by household	binary
	Savings (formal and semi-formal) use by household	binary
	Health insurance membership of household	binary
Income smoothing	Income diversification	count (metric) binary
	Household members contributing significantly to the household income	Count (metric) binary share (metric)
Social networks (density, frequency, value) / social capital	Highest participation in decision-making of all memberships in community associations	ordinal binary
	Highest frequency of attendance of all community associations' memberships	ordinal (2 vars) binary
	Total number of memberships in community associations	Count (metric) ordinal
	Household activity index in community associations (an index based on the two variables "frequency of attendance" and "total number of memberships")	share (metric) ordinal binary
Additional relevant variables		
Assets	Household wealth index (quintiles), MCA incl. durable assets, infrastructure, and animals (categorized)	ordinal
Microfinance	Household membership in microfinance	binary
Partner organization	Membership in a partner organization of the project	binary

Source: author

Seven strategies were dichotomized, in order to create an aggregate variable of SRM use in households. The strategies considered in analysis were: the *use of health insurance, use of savings, use of credit, existence of income diversification, existence of multiple*

significant income earners in the household, a *decision-making role in community associations*, and a *high activity level in social networks/community associations*.[641]

Figure 15 showed that the households in this study applied a variety of SRM strategies, while the complexity of the SRM strategy sets differed highly between households. The average number of SRM strategies applied by households was 2.76, with a median and mode of distribution of 3.

Fig. 15: Number of applied SRM strategies as percentage of households
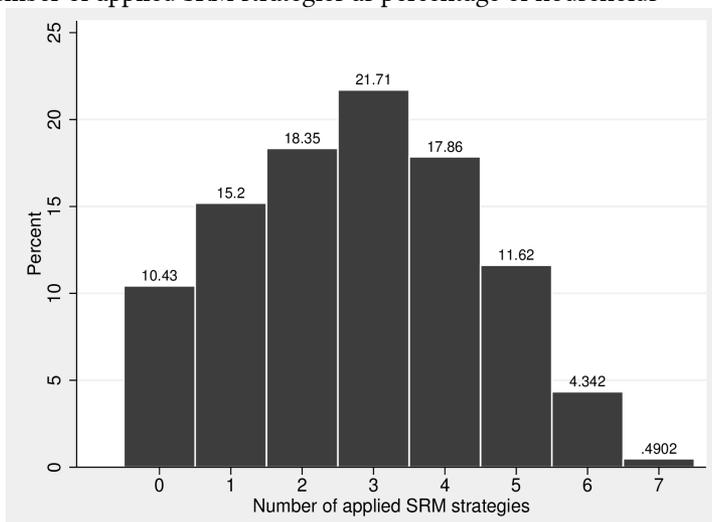
Source: Own calculation. Dataset: Pro MHI Africa. N=1428 households.

The majority of households (56.02%) applied at least three different SRM strategies, but 10.43% of households did not apply any of the seven SRM strategies presented. Figure 16 provides details on the use of several social risk management strategies by households. The foremost SRM strategy employed was the use of formal and informal savings (51.33%), followed by the use of formal and informal credit (47.9%). In total, health insurance was used by 30.53% of households, predominantly in Ghana. As result of the sampling strategy, health insurance uptake was very high in Ghana, with 410 (68.3%) out of 600 households having at least one household member insured for health,

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[641] Two variables which were used in other calculations on SRM strategies were not integrated in this aggregate variable: The variable on membership in microfinance was biased towards Malawi, because the partner institutions of the study in Malawi were microfinance institutions. The other variable not used in this aggregate measure was the wealth index, because wealth (like income) reduces vulnerability to economic shocks per se and would have distorted the aggregate measure on SRM use towards wealthier/richer households.

through any health insurance. The majority of insured households in Ghana were insured through the NHIS (99.0%), with just 4 (1.0%) households insured by any other health insurance scheme. On the other hand, health insurance uptake in Malawi was generally very low. Only 26 (3.1%) out of 828 households had at least one household member insured for health.[642]

Fig. 16: Social risk management strategies as used by households (in percent)
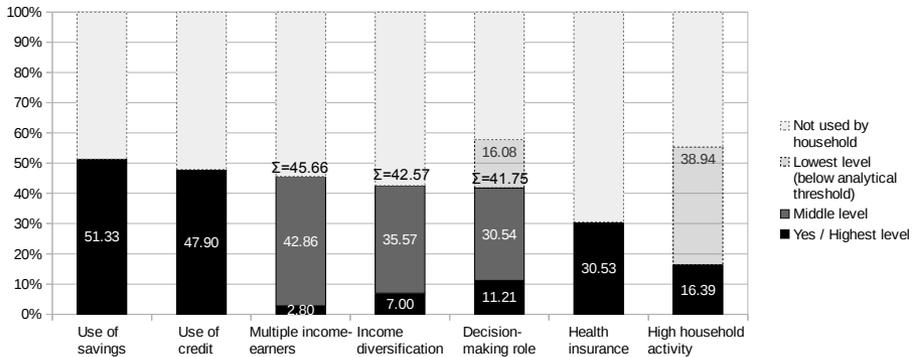
Source: Own calculation. Dataset: Pro MHI Africa. N=1428. Sorted by percentage of use.
Note: The lowest level of SRM use (below analytical threshold) was not considered in further analysis using binary variables: decision-making role is "somewhat active"; household activity level is medium.

In 45.66% of all households, more than one person significantly contributed to the household income. 42.86% of households had two income earners, but only 2.80% of households had three or more (maximum 5). Similarly, 42.57% applied income diversification, with 35.57% having had two relevant types of income sources and only 7% having had more than two different relevant income sources (maximum 3).[643]

Two proxy measures for social capital were taken into consideration as SRM strategies. The first was the decision-making role of households in community associations and social networks, including decision-making roles in the local partner organizations. 41.75% of households reported that they were very actively involved in decision-

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[642] The partner schemes in Ghana were district-wide mutual health insurance schemes (DMHIS). Therefore, the quota for membership in the local partner organization equaled health insurance policy holding by the household. This distorted the figure for health insurance in Ghana. A slight bias towards credit use in Malawi stemmed from the local partner organizations in Malawi who were microfinance institutions. 37.43% of all households using credit stemmed from Ghana and 62.57% from Malawi, although the expected percentages were 42.0% (Ghana) and 58.0 (Malawi), when corrected for the sample distribution between the countries.

[643] The households were asked to mention up to three relevant income sources, such as agricultural income, business income, salaries, wages, remittances, credit/loans.

making (30.54%) or even had a leadership role (11.21%) in community associations and social networks. The second variable was a combined variable measuring the overall activity level of households in community associations and social networks, with the aim of measuring actual and active household participation in community associations.[644] The variable was calculated by first multiplying the highest level of the ordinal variable group attendance of the household (ranging from 0 "Never" to 5 "Once a week") by the number of household memberships in community associations (ranging from 0 to 7) and then categorizing the resulting value into three activity levels. For the calculations concerning SRM strategies, the variable was dichotomized as households with high activity levels versus households with low/medium activity levels.

Most of the single SRM strategies correlated to some extent. Table 52 (in Appendix 2) presents a pairwise correlation matrix using the measure Φ. The table shows weak but significant relationships between the SRM strategies. Health insurance and income diversification were moderately related, as was credit use and decision-making role in community associations, income diversification and multiple income earners, as well as a decision-making role and high household activity levels in community associations or social networks.[645]

As we saw in figure 15, most households applied more than one strategy. Therefore, it was of interest which pairs of SRM strategies were combined by the households. Table 31 shows the most popular pairs of SRM strategies applied by households. As the calculation base was the entire sample of all 1428 households, it was possible in the table to identify the strategy pairs absolutely applied most often as well as those relatively applied most often.

In absolute terms, the pair of strategies credit and savings was popular (6.93%), which might have had two reasons. First, many institutions that provided credit, also provided savings accounts; for example, microfinance institutions and rotating savings

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[644] The respondents were asked to give information on participation in nine difference types of community associations and social networks, including the partner organizations. Additionally, the households had the possibility to mention up to three additional groups in which the household was a member.

[645] The identified strong relationship between these pairs of SRM strategies was expected. Decision-makers in community associations were more likely to show a high activity level in these associations and, particularly in Malawi, the partner organizations maintained group-lending mechanisms, so that in these organizations leadership/decision-making role and credit use was highly correlated. The relationship between income-diversification and multiple income earners was a calculation artifact, as single and very small households were unable to provide both. The moderate relationship of health insurance and income diversification was not expected, but both could be additionally related to the wealth level of the household. Some SRM strategy pairs were not significantly correlated: Health insurance and credit use; health insurance and high household activity level; income diversification and high household activity level in community associations.

and credit associations (ROSCAs). Second, savings (which included cash savings at home) are available relatively quickly, so that the sequence might have been that first the savings were dissolved and then the credit was taken. Also, the combination of credit and household's decision-making role in community associations was common (6.68%), which might have been partially an effect of membership in the Malawian partner institutions, which were community-based MFIs who relied on decision-making processes within their loan groups. Being an MFI member could have also resulted in higher roles in other community associations: 65.50% of households who combined these two strategies were members in the partner institution in Malawi, although their share in the overall sample was 20.10%. For this reason, the variable *MFI membership* was not considered in further bivariate analyses. Another common pair was income diversification and multiple income earners (6.55%), which likely, to some extent, depended on a third variable, which was *household size*, as it is a predictor of both SRM strategies: The mean size of households using this combination was 5.63, compared to 4.32 for all other households. Also, the popular combination of multiple income earners and the use of savings was not surprising (5.87%).

Tab. 31: Frequency of pairs of SRM strategies

	Health insurance	Credit	Savings	Income diversification	Multiple income-earners	Decision-making role	High hh activity level
Health insurance	1.82%	2.51%	4.33%	3.84%	2.98%	2.05%	0.84%
Credit	2.51%	3.29%	6.93%	4.04%	4.42%	6.68%	1.47%
Savings	4.33%	6.93%	4.41%	4.73%	5.87%	4.46%	1.23%
Income diversification	3.84%	4.04%	4.73%	1.33%	6.55%	2.98%	0.86%
Multiple income-earners	2.98%	4.42%	5.87%	6.55%	1.68%	3.97%	1.27%
Decision-making role	2.05%	6.68%	4.46%	2.98%	3.97%	2.38%	2.37%
High household activity	0.84%	1.47%	1.23%	0.86%	1.27%	2.37%	0.28%

10.43% of households apply no SRM strategy out of the measured SRM strategies. All strategy combinations equal 89.57%; together with those household not applying any SRM strategy it equals 100%. N=1428 households. In households applying strategy combinations > 2, the applied strategy was divided by the factorial of the number of applied strategies in the set in order to not double-count strategy pairs in the table.
Source: Pro-MHI-Africa household data.

In relative terms, it was obvious that households having a high level of activity in community associations were also more likely to have had a decision-making role (2.37%), relatively the most frequently paired strategies for households with high activity. For those households insured for health, the most frequently coupled strategy was savings (4.33%), followed by income diversification (3.84%) and multiple income earners (2.98%). The combination of health insurance with credit was less frequent (2.51%). This could have been an indication that households applying health insurance had less need to take out credit, in order to pay for health care. The gray shaded diagonal in the diagram shows the SRM strategies when they were not used by households in combinations with other SRM strategies. Savings, if applied as the only SRM strategy, was used by 4.41% of households, followed by 3.29% credit use as the only SRM strategy.

The above figures allowed the comparison of the complexity of SRM strategy sets, using the total number of applied strategies in a household, as well as the percentage of households using a particular SRM strategy. However, an important additional element in the analysis of SRM strategy sets was the combination and use of multiple strategies at the same time, which gave some insights into the question which strategies were accessible in combination, and for the question which SRM strategy was used first and which SRM strategies were used later, with increasing severity of shock (sequence of application). Generally, the identified strategy sets were very diverse, as the households in the sample applied a total of 119 different combinations of SRM strategies. For this reason, the analysis of the sets was limited to the most often applied strategy sets covering more than 50% of households in the different sub-groups observed. For this reason, depending on the N of the observed group, between 5 and 19 SRM sets were displayed in the following figures in order to be able to compare the relevant sub-groups.

First, looking at all households (figure 17), the 19 most frequently applied sets of SRM strategies covered 50.77%.[646] By far the most frequent 'set' used, by 149 households, was the application of no SRM strategy at all. This was somewhat surprising, because – as initially noted – the study could not clearly distinguish between the purposes for which the strategies were originally put into practice. For example, the strategy *multiple income earners* could have had several reasons and the primary reason was not necessarily risk management. Those households not applying any of the selected SRM

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[646] In these 19 most frequently used sets of SRM strategies by all households, 239 Ghanaian households (33.01%) and 485 (66.99) Malawian households were represented. Adjusting for the different sample sizes, Ghana was underrepresented in this overview (adj. 39.28% instead of expected 50%) suggesting that sets of SRM strategies in Malawi were more homogeneous as compared to Ghana. The higher uptake of insurance in Ghana and therefore more potential SRM set combinations could be a reason for this.

Fig. 17: Most frequently applied sets of SRM strategies of all households (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
149								0
63								1
47								1
40								5
40								2
35								2
34								1
30								4
30								3
30								2
27								5
27								4
27								3
26								2
26								1
25								2
24								3
24								1
21								4
725 hh (= 50.77% of all hh)	26.3%	42.1%	57.9%	36.8%	52.6%	26.3%	0.0%	2.42

Source: Pro-MHI-Africa household data. N=1428 households. 19 SRM sets, total of 119 SRM sets.
Note: Column percentages/means refer to the share of strategy sets and are not weighted by the number of households applying a particular set of SRM strategies.

strategies over-proportionally belonged to the lowest wealth quintile (34.90% compared to 18.30% of all other households ($\chi^2(4)=29.270$, $p<0.001$)) and to the lowest income quintile (40.27% compared to 17.83% of all other households ($\chi^2(4)=73.148$, $p<0.001$)). Particularly, the smaller households did not show any application of SRM strategies: 10.07% of those households were single households, although single households comprised only 4.13% of the overall sample. Another 64.43% of the households not applying any SRM strategy had 2-4 household members (compared to 42.79% in the sample). The majority of those households not applying any strategy were located in Malawi (89.93%).[647]

Only five (26.3%) of the 19 most frequently used SRM strategy sets included health insurance, which could have been a result of the higher representation of Malawian households in these sets. None of the 19 sets included very high levels of household activity. Although credit (in 42.1% of sets) and savings (57.9% of sets) were two of the most popular single SRM strategies in general, they were only found together in six of

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[647] The sample size in Malawi (828 hh) was 38% higher than the sample size in Ghana (600 hh). 2.50% of all Ghanaian households and 16.18% of all Malawian households did not apply any of the included SRM strategies.

the 19 sets (31.6%). This was another indication that the use of savings was a default strategy and (formal or informal) credit became necessary in fewer cases where savings sources were exhausted. Income diversification (in 36.8% of sets) and multiple income earners (52.6% of sets) went hand in hand and were a combined strategy in seven out of the 19 sets, whereas the strategy multiple income-earners was only used three times independently from income diversification. Decision-making roles in community associations and health insurance were applied in five sets (26.3%), but without clear association to other strategies.

7.4.1. Main country-specific differences in the application of SRM strategies

As already indicated in the discussion of figure 16, country-specific differences played an important role in the application of SRM strategies (see table 32). The difference in the mean of applied SRM strategies between the countries was close to one (3.34 (median 3) in Ghana and 2.34 (median 2) in Malawi), which was mostly the result of the higher uptake of health insurance in the Ghanaian sample, with 68.33% compared to 3.14% in Malawi. Hence, the existence of the NHIS complemented other SRM strategies in Ghana and did not replace them. Generally, different SRM strategies were used in Ghana and Malawi. Particularly remarkable was the much higher level of income diversification in Ghana, at 61.33%, compared to Malawi, at just 28.99%, and similarly, the strategy of multiple income-earners per household (54.5% Ghana, 39.25% Malawi). This large difference could have been explained – to some extent – by a slightly smaller household size and slightly lower average age of household members in Malawi.[648] Credit was more often used in Malawi (51.69% compared to 42.67%), but savings were more often used in Ghana 61.17% (Malawi 44.32%). Another clear difference was found in the decision-making role in community associations, which seemed to be more frequently used by households in Malawi with 49.52% (Ghana 31.00%).

Tab. 32: Application of SRM strategies by country

Country	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
Ghana	68.33%	42.67%	61.17%	61.33%	54.50%	31.00%	14.83%
Malawi	3.14%	51.69%	44.32%	28.99%	39.25%	49.52%	17.51%
Δ	65.19%***	9.02%**	16.84%***	32.35%***	15.25%***	18.52%***	2.68%

*Source: Pro-MHI-Africa household data. N=1428 households, Ghana N=600, Malawi N=828. Δ is in absolute values. Sorted by groups of SRM strategies: Financial strategies, diversification strategies, social capital strategies. χ^2-test, significance level: * p < 0.10, ** p < 0.05, *** p < 0.01*

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[648] Average household age in Ghana was 24.75 years compared to 21.28 years in Malawi. Average household size in Ghana was 5.15 compared to 4.83 in Malawi.

The misrepresentation between Ghanaian and Malawian households in the overall view of the applied SRM sets (figure 17) suggested analyzing the most frequent sets separated by country. The figures 18 (Ghana) and 19 (Malawi) show clear differences

Fig. 18: Most frequently applied sets of SRM strategies in Ghana (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
26								5
26								3
24								2
24								1
21								4
19								4
19								3
18								6
17								3
15								2
15								0
14								4
13								5
13								4
13								3
13								2
12								1
302 hh (= 50.33% of Ghana hh)	64.7%	35.3%	64.7%	70.6%	52.9%	17.6%	0.0%	3.06

Source: Pro-MHI-Africa household data. N=600 households (Ghana). 17 SRM sets, total of 101 SRM sets.

between SRM-related behavior in the two countries. The first and most important difference was the existence of health insurance targeting low-income households in Ghana, in the form of the NHIS. In 11 out of the 17 most frequently used SRM sets in Ghana (64.7%), health insurance was part of the strategy set. As discussed earlier, health insurance was almost inaccessible to the informal sector in Malawi and the government pursues a tax-based and donor-based health care system. In Ghana, those SRM strategy sets played a major role that were based on health insurance, savings, income diversification and – with a smaller concurrence – multiple income earners. Credit was employed in six out of the 17 (35.3%) most frequently used sets. Decision-making roles was of less importance (17.6%) and high household activity level played no role at all. On the other hand, due to the absence of health insurance in Malawi, SRM strategy sets combining credit, savings and decision-making roles dominated the ten most frequently used sets, with only minor focus on high household activity level (10%), income diversification (10%) and multiple income earners (20%). The higher use of social capital related strategies in Malawi could point to a higher need for risk-sharing in the absence of risk-pooling (health insurance). However, the reliance of Malaw-

Fig. 19: Most frequently applied sets of SRM strategies in Malawi (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
134								0
51								1
43								1
40								2
35								5
32								1
30								2
23								4
23								3
21								4
432 hh (= 52.17% of Malawi hh)	0.0%	70.0%	60.0%	10.0%	20.0%	60.0%	10.0%	2.30
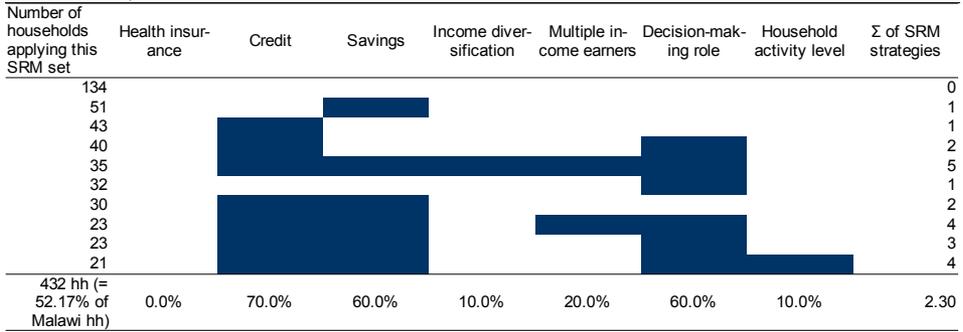
Source: Pro-MHI-Africa household data. N=828 households (Malawi). 10 SRM sets, total of 75 SRM sets.

ian households on credit, savings and decision-making role could also have been an artifact of the applied 50% quota on the sample for microfinance membership. Both Malawian partner institutions, FINCA and MUSCCO offered credit and savings and centered on a group-lending concept. Hence, a separation of households who were members in one of the partner organizations and non-member households was necessary to understand the influence of this sampling artifact.

Indeed, the number of SRM strategies applied by members of a local partner institution in Malawi (mean of 3.24 (median 3)) exceeded the application of SRM strategies by non-member households (mean 1.56 (median 1)). Also, the composition of strategies differed as depicted in table 33, particularly the use of credit and a decision-making role of households; non-member households demonstrated relatively high levels (29.25% and 29.71%, respectively) which were actually increased in the member households (77.26%, +48,01, and 72.09%, +42.39, respectively). At first glance, this could be reflective of the group lending processes in the Malawian partner institutions, that involved local meetings and decision-making. However, even excluding decision-making roles of households in local partner institutions, member households still held decision-making roles in community associations (69.00%) more often than non-member households (29.02%). Hence, one can speak of the privileged role households who were members of FINCA and MUSCCO played in their communities. However, the causal effect was unclear, whether membership in the partner institutions empowered households in the social sphere (beyond the increased access to credit and potential economic empowerment) or whether more influential households were more likely to be-

come members of one of the partner institutions. Drawing such conclusions was not possible using data from a cross-sectional household survey.

Tab. 33: SRM strategies by membership in local partner institution (Malawi)

	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
Non-Member household	0.91%	29.25%	39.46%	20.41%	26.76%	29.71%	9.07%
Member household	5.68%	77.26%	49.87%	38.76%	53.49%	72.09%	27.13%
Δ (absolute values)	4.78%***	48.01%***	10.42%**	18.35%***	26.73%***	42.39%***	18.06%***

*Source: Pro-MHI-Africa household data. N=828 households in Malawi. Δ is in absolute values. χ^2-test, significance level: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

Being a member of a partner institution also corresponded with a high household activity level in community associations and social networks, which significantly increased (+18.06%) with membership in the partner organizations, as did income diversification (+18.35%) and multiple income-earners (+26.73%).

Fig. 20: Most frequently applied sets of SRM strategies of member households in the local partner organizations in Malawi (over 50% of households)

Source: Pro-MHI-Africa household data. N=387 member households (Malawi). 10 SRM sets, total of 68 SRM sets.

Differences between member and non-member households were confirmed, when the most frequently applied sets of SRM strategies were studied. Figures 20 and 21 show that there was a significant difference between member households and non-member households in Malawi, in terms of their use of sets of SRM strategies. In comparison, membership in the local partner institutions in Ghana led to a much lower difference in the application of SRM strategies (see appendix 2) compared to Malawi. In Malawi,

non-member households showed a lower complexity of SRM sets than member households. Income diversification, multiple income-earners and a high household activity level in community associations were not applied in any of the most frequently used five SRM sets that covered over 50% of the non-member households. A decision-making role in community associations was found in only one SRM set. The only relevant SRM strategies in these sets were savings (40%) and credit (40%), which were only applied together in one of the five SRM sets. In contrast, member households applied a wide variety of SRM strategies in the most frequently used sets. Particularly, the combination of credit and a decision-making role in community association was visible, as they were always used together (9 out of 10 SRM sets), in six sets combined with savings and in six combined with multiple income-earners. Income diversification and high household activity level played a smaller role in three of the ten sets, respectively.

Fig. 21: Most frequently applied sets of SRM strategies of non-member households of the local partner organizations in Malawi (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
114								0
46			▬					1
29		▬						1
25		▬▬▬						2
25						▬		1
239 hh (= 54.20% of non-member hh)	0.0%	40.0%	40.0%	0.0%	0.0%	20.0%	0.0%	1.00
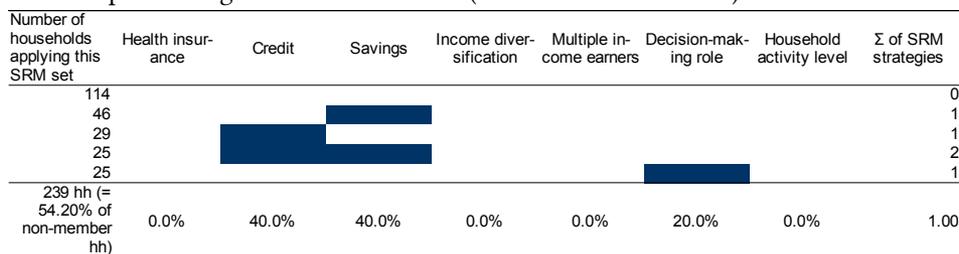
Source: Pro-MHI-Africa household data. N=441 non-member households (Malawi). 5 SRM sets, total of 51 SRM sets.

Both analyses, the one regarding the application of single SRM strategies and the one regarding strategy sets, suggested a more in-depth look at potential socio-economic differences between member and non-member households. Analysis confirmed that there were socio-economic differences between member and non-member households in Malawi. Households who were members in the local partner organizations were wealthier (mean 3.41, median 4) than non-member households (mean 2.63, median 3)[649], according to the asset index, and had a higher mean in monthly total household income: 3.44 (median 4) compared to 2.58 (median 2).[650] On average, member households had a larger household size (mean 5.40 compared to 4.33 for non-member households). As already mentioned above, due to limitations of the study, it remained unclear whether more wealthy households had a better chance to become members in

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[649] Wealth index in quintiles.
[650] Monthly total household income in quintiles.

both partner institutions or whether the membership had significantly improved their wealth status. Still, the higher socio-economic status of member households could not fully explain the substantially higher use of SRM strategies. According to the most frequently applied SRM sets, the partner organizations FINCA and MUSCCO seemed to effectively improve access to credit and savings, compared to non-member households. As nine out of ten SRM sets contained a decision-making role, they also seemed to be effective in empowering households to take active roles in community associations, as well as to increase activity levels of households in community associations, although some of this might have been as a result of participation in the organization's own committees. In these SRM sets, member households also showed a slightly higher economic activity, as income diversification was part of three SRM sets and multiple income earners were found in six sets among the member households. Hence, a generally higher reliance on social capital related SRM strategies could not be confirmed in Malawi, as such differences were limited to member households.

7.4.2. Household characteristics and application of SRM strategies

Socio-demographic factors influenced the complexity and composition of SRM strategies of a household. The age of the head of household corresponded to the complexity of SRM sets and indicated that the sets of SRM needed to be built over lifetime, with a decreasing slope reaching a peak at a certain age (see figure 22). The peak was reached in the age group 55-64, which showed an increase of 72.73% over the youngest age group of head of households (14-24 years) and 36.67% over the second age group (25-34 years) (Bonferroni multiple-comparison test (Bonf.), p<0.001). The reduction from the second-oldest to the oldest age group (65+) was not statistically significant; the difference from the oldest to the youngest group was smaller and significant (Bonf., p<0.001). Interestingly, the household size showed a similar relationship with the complexity of SRM sets. The peak was reached at the household size 8-10 and complexity was 258.22% higher than that of single households (Bonf., p<0.001). The reduction from the second-largest household size to the largest (>10 members) was not significant, but the difference between single households and the size 2-4 was significant, albeit smaller (Bonf., p<0.001). Part of the difference in the household size was certainly a calculation artifact, because some SRM strategies could not be pursued in a single household (e.g. multiple income earners) or had an increasing probability with larger household size (e.g. the definition of health insurance in a household was that at least one household member was insured for health). Also, household size and age of head of household were moderately correlated (0.249 Pearson correlation coefficient,

Fig. 22: Relation of age of head of household and household size to complexity of SRM strategies
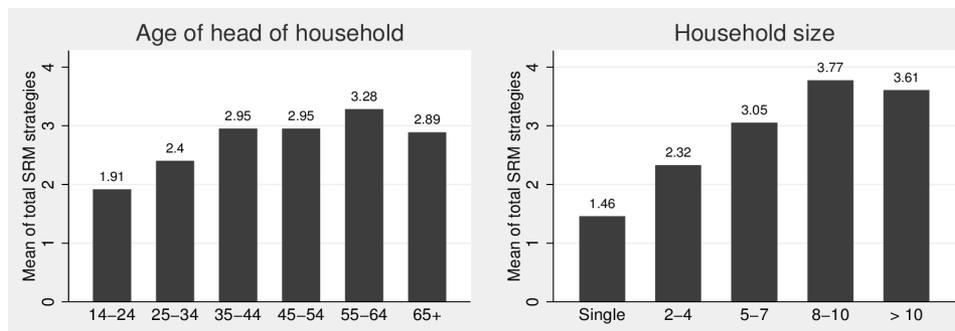
Source: Own calculation. Dataset: Pro MHI Africa

p<0.001), one year of additional age of the head of household added 0.045 SRM strate-gies to the set (OLS regression, t(1426)=9.69, p<0.001).

Tab. 34: Application of SRM strategies by age of head of household and hh size

Group#	Age group	Health in-surance	Credit use	Savings use	Income diversifi-cation	Multiple income earners	Decision-making role	High hh activity level
1	14-24	20.00%	34.29%	51.43%	28.57%	25.71%	25.71%	5.71%
2	25-34	19.73%	45.74%	48.88%	33.86%	41.93%	38.57%	11.88%
3	35-44	30.00%	51.79%	54.36%	44.87%	50.77%	46.15%	17.69%
4	45-54	36.30%	51.25%	49.82%	47.33%	47.33%	44.84%	18.86%
5	55-64	43.66%	48.59%	51.41%	56.34%	51.41%	52.82%	23.24%
6	>=65	53.13%	39.58%	53.13%	47.92%	42.71%	31.25%	20.83%
Δ (g5-g1)		23.66%***	14.31%	−0.02%	27.77%***	25.69%***	27.10%***	17.53%**

Group#	House-hold size	Health in-surance	Credit use	Savings use	Income diversifi-cation	Multiple income earners	Decision-making role	High hh activity level
1	Single	33.90%	23.73%	23.73%	22.03%	0.00%	30.51%	10.17%
2	2-4	27.00%	39.44%	44.35%	36.99%	39.44%	33.39%	12.11%
3	5-7	28.82%	53.99%	55.56%	46.18%	54.34%	48.61%	18.06%
4	8-10	42.36%	67.36%	70.14%	56.25%	56.25%	57.64%	27.78%
5	> 10	63.16%	55.26%	71.05%	57.89%	47.37%	42.11%	23.68%
Δ (g4-g1)		8.46%	43.63%***	46.41%***	34.22%***	56.25%***	27.13%***	17.61%**

Source: Pro-MHI-Africa household data.
Bonferroni multiple-comparison test, significance level: * p < 0.10, ** p < 0.05, *** p < 0.01

Table 34 shows the relationship of the usage of single SRM strategies with age of the household head and the household size. The age of the head of household had a clear and significant effect on all social capital variables, such as *decision-making role* (+27.10%) and *high household activity level in community associations* (+17.53%). With

over 25% percentage points difference between age group #5 and #1, *income diversifica-tion* and *multiple income earners* showed a clear relationship with the *age of the head of household*. The difference in *credit/loan use* by the household was not significant.[651] The increase in *health insurance usage* (+33.13%) from the lowest to the oldest age group was partially an effect of the higher relative age of the head of households in Ghana, and a result of lower life expectancy and the HIV/AIDS crisis in Malawi. In Malawi, only 27.18% were 45 years or older (in Ghana: 49.25%) and only 3.26% were 65 years or older (Ghana: 11.56%). This led to an over-representation of Ghana in these age groups, and, therefore, the provision of the NHIS in Ghana was more visible in these groups. The household size had a strong relationship with usage of single SRM strategies. All SRM strategies were increasingly used with increasing household size, except for health insurance which showed a small but insignificant increase.[652] The sex of the head of household had a weak relationship with the use of SRM strategies, households with a female head had 2.47 (median 2), a slightly lower mean than the number of SRM strategies in households with a male head, 2.83 (median 3) (Φ=0.1205, χ^2(7) = 20.7430, p < 0.01). In terms of usage of particular SRM strategies, most strategies had less than five percent difference (see table 35), except for *multiple income-earners*, which was used by *female headed households* at only 16.23% (−36.14% percentage points) and *in-come diversification* at 37.36% (−6.41%). This could have been partially an effect of the smaller mean household size of 4.06, compared to 5.17 household members in a house-hold with a male head. In contrast, *female headed households* more often showed a high *household activity level in community associations* at 20.75% (+5.36%).

Tab. 35: SRM strategies by sex of head of household

	Health in-surance	Credit use	Savings use	Income di-versifica-tion	Multiple income earners	Decision-making role	High hh activity level
Male	29.75%	48.15%	51.85%	43.77%	52.36%	41.36%	15.39%
Female	33.96%	46.79%	49.43%	37.36%	16.23%	42.26%	20.75%
Δ (F-M)	4.21%	−1.36%	−2.41%	−6.41%[*]	−36.14%[***]	0.91%	5.36%[**]

Source: Pro-MHI-Africa household data. N=1428 households. 265 households are with a female head of household. χ^2-test, significance level: [*] *p < 0.10,* [**] *p < 0.05,* [***] *p < 0.01*

In addition to the household size and the sex of the household head, the child/adult ra-tio of the household also had an effect on the consistency of SRM strategies. The differ-ence here was tested with the dichotomous form of the variable, which was 1 when the number of children (<18 years) equaled or was higher than the number of adults (>= 18

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[651] Comparison between the second-oldest age group #5 and the youngest group #1.
[652] Comparison between the second-largest household size 8-19 and single households.

years) in a household, and had the value 0 if the number of adults exceeded the number of children. The mean of the number of SRM strategies applied was slightly higher among households with a child/adult ratio >=1, a mean of 2.93 compared to 2.65 (both median 3). Although this difference seemed to be small, the measure of association Φ still indicated a weak but statistically significant relationship ($\Phi=0.1301$, $\chi^2(7) = 24.1774$, $p < 0.01$). The main differences (table 36) stemmed from the higher use of financial services among those households with a high child/adult ratio: health insurance (+5.75%), credit use (+10.51%) and savings use (+8.35%). With a child/adult ratio (<1) and a consistently lower average age of household members (17.54 compared to 26.02 years) the strategies *income diversification* and *multiple income earners* were slightly reduced. Generally, the mean household size (6.21) was higher than for households with a low child/adult ratio (4.18). This clearly showed that the relationship of pure household size with these two different diversification strategies was decoupled, when the age distribution of the household was integrated into the equation.

Tab. 36: SRM strategies by child/adult ratio (dichotomous: <1; >=1)

	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
< 1	28.31%	43.84%	48.17%	43.26%	46.35%	39.95%	15.53%
>=1	34.06%	54.35%	56.52%	41.49%	44.57%	44.02%	17.75%
Δ	5.75%**	10.51%***	8.35%***	−1.78%	−1.78%	4.07%	2.23%

Source: Pro-MHI-Africa household data. N=1428 households. 552 households have a child/adult ratio >=1.
*χ^2-test, significance level: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

As risk awareness and the financial means of a household were correlated with the educational level of the household head, it had been hypothesized that the use of SRM strategies increased with higher educational level of the head of household. However, the data did not confirm a linear relationship between the four levels of education and the number of SRM strategies (see table 37). The mean decreased from "no formal education or not completed primary school" (mean 2.95, median 3) to "completed primary school" (mean 2.31, median 2) in order to increase again with "completed secondary school" (mean 2.73, median 3). Only the highest educational level "completed tertiary education" (mean 3.23, median 3) exceeded the lowest educational group.

All the increases in the mean, from the second lowest educational level to the higher levels, were statistically significant (p<0.01 Bonf.). With regard to the single SRM strategies, the only strategy that showed a consistent increase over the four educational levels was a household decision-making role, which was in the highest educa-

tional group, 56.84%, an increase of 23.03% percentage points compared to the lowest educational group.

Tab. 37: SRM strategies by educational level of head of household

	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
Level 1	47.22%	48.87%	55.88%	49.28%	43.92%	33.81%	16.08%
Level 2	8.37%***	50.57%	47.15%	29.66%***	37.26%	42.21%	15.97%
Level 3	25.30%***	45.47%	49.74%	42.05%*	48.55%	45.13%***	16.41%
Level 4	38.95%	50.53%	50.53%	47.37%	60.00%**	56.84%***	18.95%

Source: Pro-MHI-Africa household data. N=1428 households.
*Notes: Level 1 = "no formal education or not completed primary school" (485 hh), level 2 "completed primary school" (263 hh), level 3 ="completed secondary school" (585hh) and level 4="completed tertiary education" (95 hh). Bonferroni multiple-comparison test, significance level (vs. base level: Level 1): * p < 0.10, ** p < 0.05, *** p < 0.01.*

The predominant religion of the household had an effect on the use of SRM strategies. With an average of 3.56 (median 4), Muslim households applied more strategies in relation to predominantly Christian households, with a mean of 2.53 (median). The mean of "other or no religion", which comprised only 34 households, was the lowest at 2.29 (median 2).[653] Again, this is partially a result of a country/regional effect, because 80.86% of Muslims in the sample lived in Ghana (particularly in the Northern region sub-sample which was mainly (87.86%) Muslim) and, therefore, had better access to health insurance as an SRM strategy. The assumption of a regional effect was confirmed by the difference in the uptake of health insurance shown in table 38, which was much higher among Muslim population (65.74%) compared to the other two groups.

Tab. 38: SRM strategies by predominant household religion

	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
Christian	20.19%	44.58%	46.82%	38.32%	44.77%	42.80%	15.61%
Muslim	65.74%***	59.26%***	66.67%***	58.64%***	49.07%	37.96%	19.14%
Other	20.59%	44.12%	50.00%	23.53%	41.18%	35.29%	14.71%

*Source: Pro-MHI-Africa household data. N=1428 households. Households: 1070 Christian, 324 Muslim ,34 other. Bonferroni multiple-comparison test, significance level (vs. base level: Christian): * p < 0.10, ** p < 0.05, *** p < 0.01. Category 'other religion' was not significant in any oneway comparison.*

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[653] The difference between "other or no religion" and "Christian" was not significant, whereas the difference with "Muslim" was significant (Bonf., p<0.001).

As previously discussed, the wealth level of households may be essential for social risk management in two ways. First, it reduces the vulnerability of households and second it enables households to have better access to other SRM strategies. As it influenced both, it can be assumed that there was a relationship between the wealth quintile of a household and the number of applied SRM strategies. In the sample, the lowest wealth quintile was able to maintain a mean of 2.37 (median 2) SRM strategies, whereas the wealthiest quintile applied a mean of 3.2 (median 3) SRM strategies.[654] The difference in SRM strategy application between the wealth quintiles was statistically significant ($\chi^2(28)$ = 68.789, p < 0.001). Table 39 shows the dependency of SRM strategies on the wealth quintile of the household. Strong, statistically significant differences between the 5th quintile (wealthiest) and the 1st quintile (poorest) were found for the variables *multiple income earners in the household* (+25.04% percentage points) and i*ncome diver-sification* (+12.06%). Similarly, the uptake of health insurance was associated with the wealth quintile of the household (+12.38%). The data also confirmed that the wealthiest quintile of households was more influential in community associations as they had more very active or leadership decision-making roles in community associations (+17.66%), as compared to the least wealthy quintile. The *use of credit* and the *use of savings* as well as *high household activity level in community associations* were higher with the wealthiest quintile of households, but they were not statistically significant.

Tab. 39: Application of SRM strategies by wealth quintiles

Quintiles	Health in-surance	Credit use	Savings use	Income di-versifica-tion	Multiple income earners	Decision-making role	High hh activity level
Quintile 1	25.87%	43.36%	48.25%	36.01%	36.36%	33.92%	12.94%
Quintile 2	29.41%	51.56%	53.98%	39.45%	40.83%	40.83%	15.22%
Quintile 3	28.37%	50.71%	53.19%	40.78%	42.55%	38.65%	13.83%
Quintile 4	30.77%	46.15%	48.25%	48.60%	47.20%	43.36%	19.93%
Quintile 5	38.25%	47.72%	52.98%	48.07%	61.40%	51.58%	20.00%
Δ (Q5-Q1)	12.38%**	4.36%	4.73%	12.06%**	25.04%***	17.66%***	7.06%

*Source: Pro-MHI-Africa household data. N=1428 households. Bonferroni multiple-comparison test, significance level: * p < 0.10, ** p < 0.05, *** p < 0.01.*

The uptake of health insurance by wealth quintile needed to be viewed separately by country, due to the systemic differences in health care financing between Ghana and Malawi. In Malawi, health insurance membership was severely limited to wealthy households. The majority of insured households fell into the highest wealth quintile

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[654] 2nd quintile: mean 2.71 (median 3), 3rd quintile: 2.68 (3), 4th quintile: 2.84 (3).

with a mean of 4.5 (median 5), whereas the uninsured households averaged a mean wealth quintile of 2.9 (median 3).[655] In Ghana, on the other hand, the findings confirmed the pro-poor orientation of the NHIS: The mean wealth quintile of uninsured households was 2.8 (median 3) and, hence, only slightly lower than the mean wealth quintile of insured households which was 3.1 (median 3).[656]

A general assumption of the hypothesis group H3 was that households applied a wide array of social risk management strategies. The majority of households used three or more of the selected SRM strategies, although a tenth of the households did not apply any of the tested SRM strategies. Furthermore, it was hypothesized that several socio-economic and geographic characteristics had a significant relationship with the complexity of SRM strategies, as well as the use of particular sets of SRM strategies (hypothesis H_{3a}). Several socio-economic and geographic variables have been found to be significant factors, but also some SRM strategies themselves had levels of correlation with each other.

Between Ghana and Malawi, a significant difference was identified. Households in Ghana applied significantly more SRM strategies than in Malawi. This difference can be largely attributed to the SRM strategy *health insurance*, which had a wide outreach in Ghana, but was barely existent in the Malawian sample. Also, the composition of SRM strategies significantly differed between the countries: While *health insurance*, *use of savings*, *income diversification* and *multiple income earners* were significantly higher in Ghana, in Malawi *credit use* and *decision-making roles in community associations* were used significantly more often. In Malawi, a significant difference was detected between members and non-members of the partner organizations, which were microfinance institutions.

There was also a significant relationship between the complexity of SRM strategies and the age of the head of household and household size, respectively. With both age of head and household size, the complexity of SRM strategies steadily increased, but reached a peak in the age group (55-64 years) and household size (8-10), respectively. This finding was consistent with the increased use of most of the single SRM strategies. Other factors were also related to the complexity of SRM strategies in the household. Female headed households showed slightly less complex SRM strategy sets compared to other households. Also, female headed households showed a reduced *income diversification* and fewer *multiple income earners*, while *high household activity level in*

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[655] The mean of quintiles (1 lowest quintile, 5 highest quintile) equaled always 3.

[656] Leaving out the four households who were insured with other health insurance schemes did not make any difference regarding the wealth status of households insured with the NHIS vs. uninsured households.

community associations and social networks was increased. The education of the head of household did not have a significant relationship with the complexity of SRM strategies. Some single SRM strategies were significant when comparing single educational levels, but no linear relationship was confirmed. The predominant religion of the household was, again, a highly significant factor, as Muslim households used significantly more complex SRM strategy sets; although it was assumed that the real effect resulted from a country/regional difference, particularly an effect stemming from the Northern region in Ghana, which was the only predominantly Muslim region. The household wealth quintiles were highly significant and positively related to the complexity of SRM strategies. In Ghana, no relationship between the uptake of health insurance (in the NHIS) and the household wealth quintiles was found, indicating equitable access to the scheme.

In conclusion, hypothesis H_{3a} was confirmed with regard to a variety of variables that had a relationship with both the complexity of SRM strategies and the use of single SRM strategies and certain SRM strategy sets: household country, membership in local partner organization (Malawi), age of head of household, household size, sex of head of household, household religion and the wealth quintile.

7.4.3. High risk exposure and household's SRM strategies

It was hypothesized that households exposed to high health risks and those having experienced high health shocks, such as high health care costs, changed their behavior with regard to social risk management (hypotheses H_{3b}-H_{3e}). In this section, the relationship between the complexity and sets of SRM strategies with the household exposure to general risks and high health risks was analyzed (hypotheses H_{3b} and H_{3c}). It was assumed that high-risk households built more complex sets of SRM strategies and also focused on different kinds of sets of SRM strategies depending on their risk status.

Depending on the level of household exposure to general risks (without health risks) it was expected that households adopted their risk management behavior accordingly. The variable for exposure to general risks was the simple total number of different kinds of risks (without health risks) that the household had experienced over the last 3 years which had a negative economic impact on the household. The resulting total was grouped into four categories. Depending on the risk class of household's exposure to the reported general risks, a clear and continuous change in the complexity of applied sets of SRM strategies was identified (figure 23). Households reporting zero risks had a mean of 2.61 (median 3) strategies, a mean of 2.60 (median 3) in the risk class "1-3 risks", a mean of 3.15 (median 3) in the risk class "4-6 risks" and a mean of

Fig. 23: Number of SRM strategies by exposure of households to severe general risks, without health risks (4 classes)
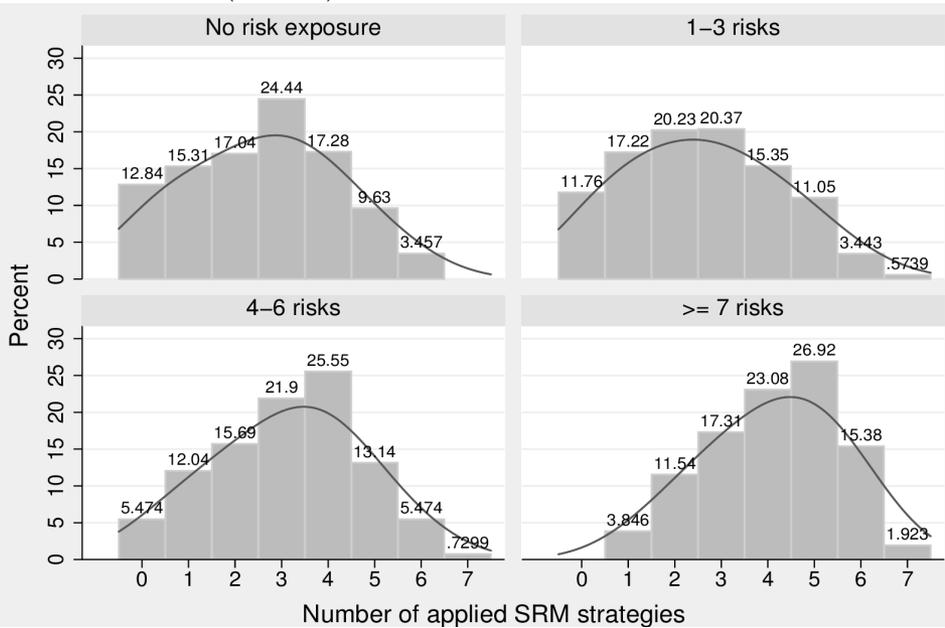
Source: Pro-MHI-Africa household data. N= 1428 households. 405 hh in class "no risk exposure", 697 hh in "1-3 risks", 274 hh in "4-6 risks" and 52 hh in class ">=7 risks".

4.12 (median 4) in the highest risk class ">= than 7 risks". Using the Bonferroni multiple comparison test, only the difference between the risk class of "1-3 risks" and "no general risk exposure" was not statistically significant, whereas all other differences were highly significant (Bonf., p<0.01). Figure 23 shows the changes in the complexity of SRM strategies graphically. The Gaussian kernel density plot in the figure shows that with increasing risk exposure, the highest density moved to more complex SRM strategy sets (in the graph to the right side) and the entire distribution changed from a right skewed distribution in the lowest risk class to a left skewed distribution in the highest risk class. Further comparison of these two extreme groups, showed that 12.84% of the lowest class applied none of the measured risk management strategies, compared to zero percent in the highest risk class. No household in the lowest risk class applied a set with seven SRM strategies, compared to 1.92% in the highest risk class. The analysis on the relative use of each of the SRM strategies painted a similar picture in table 40. The use of all single SRM strategies increased from the lowest to the highest risk class, except for the variable *decision-making role in community associa-*

tions, which decreased from 45.43% to 44.23% (−1.20%). There was only a small increase from the second lowest risk class to the highest risk class (+4.92%), but both were not statistically significant (Bonf., p=1.00). For all other SRM strategies, there was a strong increase, ranging from +16.32% (income diversification) to +30.73% (health insurance).

Tab. 40: SRM strategies by household exposure to general risks, without health risks

	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
No risk #1 exposure	28.89%	42.47%	50.12%	37.53%	43.21%	45.43%	13.09%
#2 1-3 risks	25.11%	46.63%	48.64%	41.03%	44.62%	39.31%	14.78%
#3 4-6 risks	41.24%	55.11%	54.74%	51.82%	48.18%	42.70%	21.17%
#4 >= 7 risks	59.62%	69.23%	80.77%	53.85%	67.31%	44.23%	36.54%
Δ (g4-g1)	30.73%***	26.76%***	30.65%***	16.32%	24.10%***	−1.20%	23.45%***

Source: Pro-MHI-Africa household data. N = 1428 households.
Bonferroni multiple-comparison test, significance level: * p < 0.10, ** p < 0.05, *** p < 0.01
Notes: Δ (g4-g1) for income diversification not statistically significant. Δ (g3-g1) is statistically significant at p<0.01 and Δ (g3-g2), p<0.05.

The finding that the complexity of SRM strategy sets consistently increased with increasingly severe general risk exposure (without health risks) led to the initial confirmation of the hypothesized positive relationship of high risk households and their application of more complex sets of SRM strategies (hypothesis H$_{3b}$).

Further analyses concentrated on the high (health) risk variable at household level that had been conceptualized in section 6.3 and discussed further in section 7.3. Similar to the exposure of households to general risks, it was expected that households who carried high health risks anticipated higher future health shocks and associated health care costs, higher than the average. Therefore, for those households classified as high-risk households, it was assumed that they built up SRM strategies in anticipation of shocks. The analysis confirmed this hypothesis: The complexity of SRM sets significantly differed between low or medium risk households (mean 2.67, median 3) and high-risk households (mean of 3.78 and a median of 4) (t(1426)=-7.01, p<0.001).

Table 41 shows the details of the differences between SRM strategies used by low/medium risk households and high-risk households. All single SRM strategies were more likely to be used by high-risk households. The strongest, statistically significant increases resulted from health insurance usage (+24.40% percentage points), savings usage (+25.21%), income diversification (+22.60%) and credit usage (+15.02%). Also, high-risk households more often had statistically significantly higher household activity levels in community associations (+13.68%) and slightly more decision-making roles

in community associations (+8.46%), which was statistically significant on the 10%-level. There was a minor, not statistically significant, higher percentage of multiple in-come-earners. The latter was somewhat surprising, because the mean household size of high risk households (5.98) was higher when compared to low/medium risk house-holds (4.87) and a logistic regression of household size on the existence of multiple in-come-earners in a household showed that there was a 19.5% increase in odds of having multiple-income earners if there was one additional person in the household (LR-χ^2-test(1), p<0.001). Hence, this result indicated that high health risks in a household might have hampered household members from starting income-earning activities.

Tab. 41: SRM strategies by health risk classification of household

	Health in-surance	Credit use	Savings use	Income di-versifica-tion	Multiple income earners	Decision-making role	High hh activity level
Low/medium risk	28.40%	46.58%	49.19%	40.60%	45.59%	41.14%	15.12%
High risk	52.80%	61.60%	74.40%	63.20%	47.20%	49.60%	28.80%
Δ (high-low)	24.40%***	15.02%***	25.21%***	22.60%***	1.61%	8.46%*	13.68%***

Source: Pro-MHI-Africa household data. N = 1428 households. 125 households classified as high-risk households. χ^2-test, significance level: * p < 0.10, ** p < 0.05, *** p < 0.01

In the sample, the combination of SRM strategies strongly differed between high-risk households and those with low or medium health risk (see figures 24 and 25). The 125 (=8.75%) high-risk households applied 57 different sets of SRM strategies in total, whereas the much larger group of low/medium risk households (91.25%) applied 118 different sets. Comparing the most frequently applied sets of SRM strategies, covering over 50% of the two sub-groups, high-risk households applied all single SRM strategies substantially more often than low or medium risk households, except for *multiple in-come-earners*, which showed a slightly lower percentage. Particularly, the combination of credit and savings was much more popular among high-risk households (in 11 of the 16 sets (68.8%)), in connection with health insurance (in 7 out of the 16 sets (43.8%)), but played only a minor role in the most frequently applied sets among low/medium risk households. These three strategies were also frequently applied in connection with income diversification (in 8 out of the 16 sets (50%)), which was also applied much more often in high-risk households than in low/medium risk households. A remarkable six SRM sets used by high-risk households included a high household activity level (none in the low/medium-risk group) and a slightly higher use of deci-sion-making roles in community associations. Multiple income earners seemed to be applied slightly more often by low-risk households. The most frequently used 'set' of

Fig. 24: Most frequently applied sets of SRM strategies of high-risk households (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
7								2
6								4
5								4
4								7
4								6
4								5
4								5
4								4
4								1
4								0
3								6
3								5
3								4
3								4
3								3
2								6
63 hh (= 50.04% of high-risk hh)	68.8%	68.8%	81.3%	68.8%	50.0%	43.8%	31.3%	4.13

Source: Pro-MHI-Africa household data. N=125 high-risk households. 16 SRM sets, total of 57 SRM sets. Note: Column percentages/mean are not weighted by the number of households applying a particular set of SRM strategies.

Fig. 25: Most frequently applied sets of SRM strategies of low-risk households (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
145								0
61								1
45								1
39								2
36								5
33								1
30								3
30								2
28								2
26								4
25								4
25								3
25								2
25								2
24								5
24								1
23								3
22								1
666 hh (= 51.11% of low-risk hh)	22.2%	44.4%	55.6%	33.3%	50.0%	27.8%	0.0%	2.33

Source: Pro-MHI-Africa household data. N=1303 Low/Medium risk households. 18 SRM sets, total of 118 SRM sets.

SRM strategies among low/medium risk households was the application of none of the tested SRM strategies at all.

As previously discussed, old age was included as one of the variables in the high-risk household indicator and the Ghanaian sample contained more individuals in the older age groups. Therefore, it was important to analyze the country-related differences within the high-risk group. Figures 26 (Ghana) and 27 (Malawi) showed that there was a clear difference between high-risk households in Ghana and Malawi, with regard to their SRM sets.

Fig. 26: Most frequently applied sets of SRM strategies of high-risk households in Ghana (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
6								4
4								7
4								6
4								5
4								4
4								4
4								1
3								5
3								4
3								4
39 hh (= 50.65% of high-risk hh)	90.0%	70.0%	80.0%	70.0%	50.0%	50.0%	30.0%	4.40

Source: Pro-MHI-Africa household data. N=77 high-risk households in Ghana. 10 SRM sets, total of 36 SRM sets.

While in Ghana health insurance was applied in 90.0% of the most frequent sets of SRM strategies by high-risk households, health insurance was not an accessible SRM strategy for high-risk households in Malawi (0.0%). While savings use in the SRM sets in Malawi was higher (88.9% of sets compared to 60.0% in Ghana), the strategies credit use and income diversification were approximately equal. Multiple income-earners were more commonly part of the most frequent sets in Ghana (50.0%) than in Malawi (33.3%), while the social capital-related strategies *decision-making role in community associations* (Gh: 50.0%; Mw: 77.8%) and high *household activity level* (Gh: 30.0%; Mw: 44.4%) were more frequently part of the set in Malawi than in Ghana.

The analysis of high-risk households confirmed hypothesis H$_{3b}$, that high-risk exposure of households was related to a significantly higher complexity of SRM strategy sets. The interpretation of the findings regarding hypothesis H$_{3c}$ was more complicated; the hypothesis stated that the high-risk exposure of households was related to higher application of those SRM strategies that could have been considered pro-active strategies, compared to other groups.

Fig. 27: Most frequently applied sets of SRM strategies of high-risk households in Malawi (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
5								2
3								6
3								5
3								0
2								5
2								4
2								4
2								4
2								4
24 hh (= 53.33% of high-risk hh)	0.0%	66.7%	88.9%	66.7%	33.3%	77.8%	44.4%	3.78

Source: Pro-MHI-Africa household data. N=48 high-risk households in Malawi. 9 SRM sets, total of 27 SRM sets.

In the general analysis, it was seen that high-risk households were significantly more likely to use a wider variety of SRM strategies. Particularly, the use of those SRM strategies, that could be considered proactive, significantly increased. Results showed a significant increase of over 20% in usage of health insurance and income diversification, two strategies that could be considered pro-active. The use of savings had a similar increase and a strong pro-active component, although savings could also be used as a reactive SRM strategy. The mostly reactive strategy use of credit increased by about 15%. Two more proactive strategies that were more often used by high-risk households were a high *household activity level in community associations* with an increase of about 14 percentage points and a *decision-making role in community associations* with an increase of about 8 percentage points. These differences were also confirmed by analyzing the most frequently applied sets of SRM strategies. Particularly, a high *household activity level* increased from 0% of sets among low/medium households to 31% of sets among high-risk households. A remarkable finding in the most frequently applied sets of SRM strategies of high-risk households in Ghana was that 90% of sets included health insurance as a strategy. This indicated an above average uptake of health insurance by high-risk households. It also indicated that high-risk households were – to some extent – aware of their high health risk status and acted accordingly, in a proactive manner, in order to protect the household from high health care costs. It also indicated a level of adverse-selection from the viewpoint of the insurer. Generally, hypothesis H_{3c} was confirmed.

7.4.4. Exposure to high health care costs and household's SRM strategies

It was hypothesized that the experience of high health shocks, particularly of high health care costs, was related to the application of more complex sets of SRM strate-

Fig. 28: Most frequently applied sets of SRM strategies of high-cost households (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
9								5
8								4
5								6
5								5
5								4
5								2
4								4
4								1
45 hh (= 51.11% of high-cost hh)	0.0%	87.5%	100.0%	50.0%	62.5%	62.5%	25.0%	3.88

Source: Pro-MHI-Africa household data. N=88 high-cost households. 8 SRM strategies, total of 36 SRM strategies.

gies. This was confirmed in analysis: High-cost households had a mean of 4.07 (median 4) SRM strategies, compared to 2.67 (median 3) in low or medium cost households (t(1426=-7.734, p<0.001).

Fig. 29: Most frequently applied sets of SRM strategies of low/medium-cost households (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
149								0
59								1
47								1
40								2
34								1
31								5
31								2
30								3
30								2
27								3
26								2
25								5
25								2
25								1
24								1
23								4
22								4
21								3
21								3
690 hh (= 51.49% of low-cost hh)	21.1%	47.4%	52.6%	36.8%	52.6%	26.3%	0.0%	2.37

Source: Pro-MHI-Africa household data. N=1340 low/medium cost households. 19 SRM sets, total of 119 SRM strategies.

Figures 28 and 29 show the most frequently applied sets of SRM strategies for high-cost households and low/medium cost households, respectively. An important finding was that the strategy health insurance was not among the most frequently applied SRM strategy sets of high-cost households. This could have been an indication that the aim of social and micro health insurance, to protect households from high health care costs, was successful.

The most frequently used SRM strategy sets of high-cost households included the use of savings (used in all eight sets (100%)) and credit (used in seven out of the eight sets (87.5%)). These seemed to be the typical SRM strategies used in case of a health shock and associated treatment costs. The SRM sets of high-cost households often included a decision-making role of the household and multiple income-earners, both at 62.5%. Income diversification played a role in 50% of sets, but high activity levels in community associations could only be found in two out of the eight most frequent SRM sets (25%).

Given this absence of health insurance in the most frequently applied sets of SRM strategies of high-cost households, the question became whether this was, rather, the result of a country-effect. Figures 30 (Ghana) and 31 (Malawi) show that there was, in fact, a significant country-effect. High-cost households in Ghana used health insurance in 4 out of 6 of the most frequent SRM sets, whereas the high-cost households in Malawi did not use health insurance.

In both countries, credit and savings were the main SRM strategies for these health shocks. In Ghana, income diversification was used much more often (100%) than in

Fig. 30: Most frequently applied sets of SRM strategies of high-cost households in Ghana (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
7								4
3								6
3								4
2								6
2								5
2								5
19 hh (= 51.35% of high-cost hh)	66.7%	83.3%	100.0%	100.0%	83.3%	50.0%	16.7%	5.00

Source: Pro-MHI-Africa household data. N=37 high-cost households in Ghana. 6 SRM strategies, total of 21 SRM strategies.

Malawi (50%). In Malawi, high-cost households more frequently had a decision-making role in community associations (83.3%) compared to Ghana (50%).

When restricting the focus on SRM strategies only on those applied during illness episodes, the sequence of the application of household SRM strategies could be analyzed, depending on the extent of health care costs. This gave a better understanding in which order SRM strategies were applied as the intensity of a health shock increased. Figure 32 shows the use of the main SRM strategies that paid for the reported household illness episodes in the last three months (allowing for multiple responses).

Fig. 31: Most frequently applied sets of SRM strategies of high-cost households in Malawi (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
7								5
5								6
5								5
4								4
4								4
3								2
28 hh (= 54.90% of high-cost hh)	0.0%	100.0%	100.0%	50.0%	66.7%	83.3%	33.3%	4.33

Source: Pro-MHI-Africa household data. N=51 high-cost households in Malawi. 6 SRM strategies, total of 21 SRM strategies.

The graphs in figure 32 show a main difference between Ghana and Malawi. In the Ghanaian sample, health insurance (mostly in the NHIS) was the most frequent SRM strategy in the first quartile of illness costs. The relative use of health insurance decreased in higher cost quartiles, but was still around 50% in the third and fourth quartile. This – in conjunction with the steep rise in the use of savings between the first and second quartile – indicated that health insurance effectively reduced overall health care expenditures at the household level. As expected, in Malawi, health insurance usage was very low. It is interesting, in the Malawian case, that the first quartile was dominated by no payment source. When the illness costs of the households in the first quartile were analyzed in more detail, all of these households reported zero health care costs (204 households equal 40.72% of all Malawian households reporting illness episodes). In comparison, in Ghana, only 61 households (equals 17.73% of all Ghanaian households reporting illness episodes) reported zero cost. This indicated that basic health care in Malawi was apparently provided without additional cost, as promised by the Malawian government, albeit it was unclear how large the difference was in self-treatment and non-utilization of health care facilities, in the comparison of Malawi and Ghana.

In both countries, savings seemed to be the most quickly available SRM strategy. When health care costs increased, the use of savings was strongly increasing, with a descending slope reaching 78.57% in Ghana and 90.98% in Malawi, in the highest quartile. On the other hand, the use of borrowing slowly grew with an increasing slope, reaching 33.33% in Ghana and 26.23% in Malawi. Selling assets constantly increased in Ghana from the first to the highest quartile, reaching 21.43%; in Malawi, on the other hand, assets sales remained very low and only significantly increased in the fourth quartile to 8.20%. In-kind payments did not show a clear direction in either country and averaged 10.71% in Ghana and 4.10% in Malawi, in the second to fourth quartile. These findings on the sequence of SRM strategies in use, confirmed the observation by Devereux that several SRM strategies were used in multiple iterative layers with increasing intensity (see section 4.3).

Fig. 32: SRM strategies by health care costs quartiles (illness episodes)
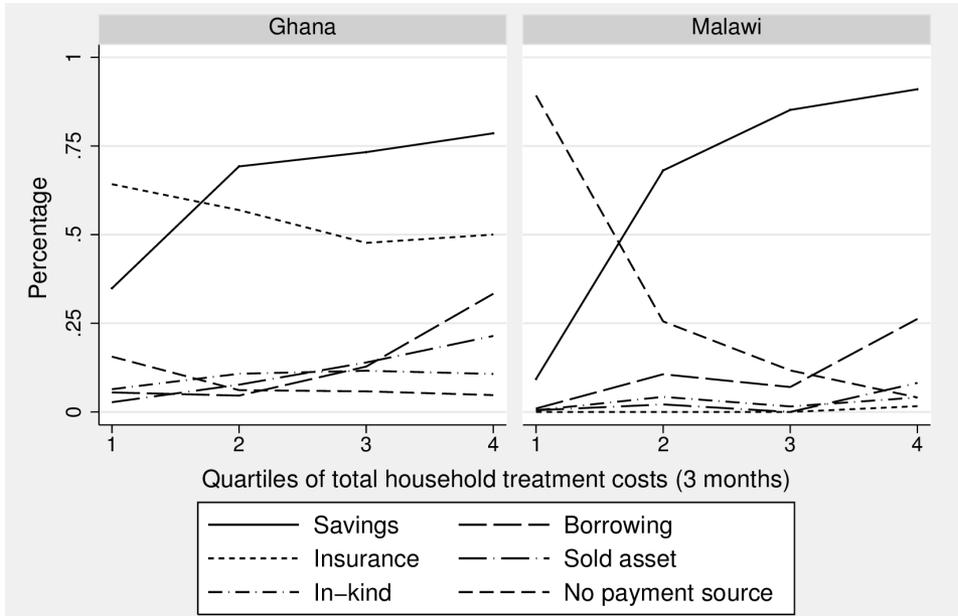
Source: Pro-MHI-Africa household data. N=845. Illness episodes
Note: The source "Other" was omitted in the chart, as it was reported only by 5 households.

Fig. 33: Details on the use of savings by health care costs quartiles (illness episodes)
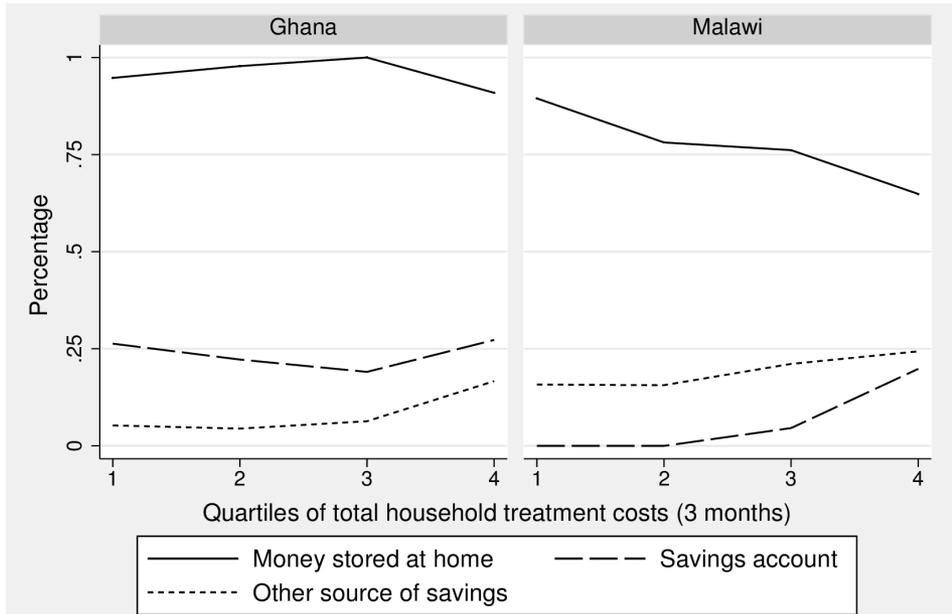

Source: Pro-MHI-Africa household data. N=483 (household using savings in illness episodes). Ghana N=212, Malawi N=271. Savings is base at 100%. Multiple response in savings details.

While figure 32 shows the high relevance of savings in paying for health care, figure 33 shows the details of the sources of savings, out of all households having used savings as a strategy (allowing for multiple responses). Clearly, cash stored at home was the most frequently used strategy in all health care expenditures quartiles. While the use of cash stored at home as one of the savings sources remained close to 100% in Ghana, with increasing health care costs, it seemed to be increasingly substituted by other savings sources in Malawi. Similarly, while the use of savings accounts (from formal sources such as banks and MFIs, but also from informal sources such as ROSCAs) hovered around 25% in Ghana, it increased in Malawi from 0% in the first quartile to 19.82% in the highest quartile. The use of other savings sources, which included business savings, current income/salaries, sales of farm or other products, and other not further specified sources, increased from the first to the highest quartile. In Ghana, it increased from 5.26% in the first quartile to 16.67% in the highest quartile, in Malawi from 15.79% to 24.32%, respectively.

Figure 34 shows the details of borrowing sources. Generally, borrowing was used by a smaller number of households (96 hh) compared to savings (483 hh). Due to this

Fig. 34: Details of borrowing by health care costs quartiles
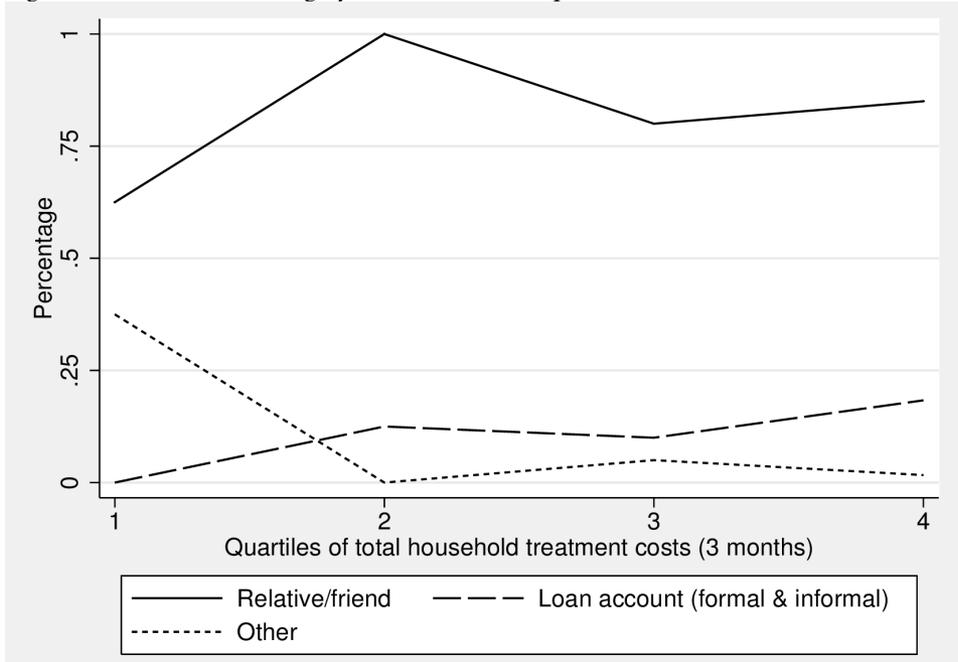
Source: Pro-MHI-Africa household data. N=96 (household usings borrowing in illness episodes). Borrowing is base at 100%. Multiple response in borrowing details.

smaller number, figure 34 shows the details of borrowing sources for both countries together. The main source of borrowing was informal, through friends or relatives. It increased (with a peak of 100% in the second quartile) from 62.5% in the first to 85.0% in the fourth quartile. Borrowing from formal sources, such as banks and MFIs, or from informal sources, such as credit clubs, for the explicit use to pay for health care expenditures did not seem to be widespread, as only 14 households made use of these sources. Their use increased from 0% in the first quartile to 18.3% (11 households) in the highest quartile. Eight out of these households borrowed from one of the local partner organizations in Malawi. The category *other borrowing sources* was only relevant in the first quartile, used by 37.5% of borrowing households, but played only a minor role in the higher quartiles.

It was hypothesized that high-cost households used more complex sets of SRM strategies than other households (hypothesis H_{3d}), which was confirmed in analysis. High-cost households showed a substantial and significant increase in the complexity of SRM strategy sets. Additionally, it was seen in the general analysis that *health insur-*

ance could not be found among the most frequent sets of SRM strategies of high-cost households. In the Ghana-specific analysis, high-cost households used health insurance in about 67% of most the frequently used SRM sets.[657] Not only did this indicate that high-cost households were not more likely to use health insurance than other households, but it also showed that the financially protective effect of health insurance (i.e. NHIS) was limited. Generally, it should be noted that *use of credit* (in 88% of most frequently used SRM strategy sets) and *use of savings* (in 100% of sets) were used substantially more often than other strategies; credit and savings also had the highest percentage point increase from low/medium cost households to high-cost households. The analysis on the application of SRM strategies, dependent on the health care costs quartiles, gave a similar picture. While the use of savings steadily increased from the first quartile, the use of credit ("borrowing") started at a low level in the first cost quartile, but steadily increased with higher costs. In Ghana, the sale of assets also increased with the cost quartiles, but stayed on a lower level. Health insurance in Ghana played an important role as an SRM strategy and was the most frequently used strategy in the lowest cost quartile. In the analysis of health care costs quartiles, health insurance had some protective effect against higher health care costs. However, the share of insured households remained at about 50% for the higher health care cost quartiles, which challenged the social protection function of health insurance in Ghana. In Malawi, an interesting finding was the payment category *no payment source*, which was reported by the majority of households in the first quartile of total household treatment costs; as expected, with increasing cost levels, this category, indicating no elaborate payment source, steadily decreased. This indicated that some health care in Malawi was provided for free or at rates that did not require a particular payment source, in line with the government's promise. In comparison, in Ghana, *no payment source* was only relevant in the first cost quartile, where it was reported by about 18% of households.

7.4.5. Relationship of high-risk and high-cost households with SRM strategies

In the previous two sections, it has been shown that both types of households, those who were classified as high-risk households and those who experienced high health care costs, behaved differently than other households regarding social risk management.

As was already discussed in section 6.3 on the operationalization of the high-risk variable, there was some interaction between the two variables of high-risk household

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[657] Overall, 68.3% of households in Ghana had health insurance. Out of those, who experienced high costs, 56.8% held an insurance policy.

and high-cost household. In this regard, it was hypothesized that high-cost households who were also high-risk households had a significantly different set of SRM strategies, compared to other high-cost households (hypothesis H_{3e}). It was of major interest to understand the interactions of these two variables towards social risk management. Table 42 shows how the complexity of SRM strategy sets differed depending on the inter-dependent influence of both of the variables.

Tab. 42: Relationship of high-risk and high-cost with complexity of SRM strategies

	Low/medium risk hh	High risk hh
Low/medium cost hh	2.59 (3)	3.76 (4)
High cost hh	4.13 (4)	3.86 (4)

Source: Pro-MHI-Africa household data. N = 1428 households. Anova model specification F(3,1424)=37.86, p<0.001. Mean of number of SRM strategies, the median is given in brackets.

The data in Table 42 indicated that high-risk households that did not incur high costs, had a considerably higher mean (3.76) of SRM strategies, as compared to low/medium risk households that did not also face high costs (2.59); this difference was highly statistically significant (Bonf., p<0.001). However, the indication that low/medium risk households that faced high costs applied a higher number of SRM strategies (4.13) than high-cost and high-risk households (3.86) was somewhat surprising. The difference was not statistically significant (Bonf., p=1.00). When a low/medium risk household faced high costs, the average number of applied SRM strategies substantially increased from 2.59 to 4.13, which was highly significant (Bonf., p<0.001). On the other hand, comparing high-risk households that did not face high costs to those households that did, one noticed that there was only a small increase (from 3.76 to 3.86), which was not statistically significant (Bonf., p=1.00). These findings confirmed the hypothesis that high-risk households were aware of their risk status and built more complex sets of SRM strategies in anticipation of future costs, even without recently encountering high costs. On the other hand, low/medium risk households seemed to be able to mobilize a substantial number of SRM strategies when facing high costs. Assuming that the household risk status was relatively stable for a longer time period than high-costs (which corresponded to the 3 months recall period), it could be assumed that those SRM strategies that were mobilized relatively quickly by low/medium risk households, more likely referred to reactive SRM strategies than proactive strategies.

The analysis in table 43 went into more depth concerning this hypothesis. A variety of SRM strategies significantly increased for low/medium-risk households that faced high costs, compared to those low/medium-risk households that did not: Credit use (+35.9 % (percentage points)), savings use (+ 48.8%), income diversification (+15.4%),

multiple income earners (+19.7%) and decision-making roles in community associations (+27.60%). In contrast, the difference in use of SRM strategies by high-risk households that faced high costs (#4) over those high-risk households that did not (#2) was not significant, except for the use of health insurance, which was 29.12 percentage points lower among high-risk & high-cost households (statistically significant, Bonf. $p<0.05$). This was expected, as health insurance aims for financial protection from high costs, which was partially confirmed by this finding.

Tab. 43: Use of SRM strategies in relationship to high-risk and high-costs

	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
#1 Low risk & low cost hh	28.56%	44.74%	46.68%	39.81%	44.50%	39.56%	14.64%
#2 High risk & low cost hh	57.69%	59.62%	70.19%	61.54%	47.12%	51.92%	27.88%
Δ (#2-#1)	29.13%***	14.87%**	23.51%***	21.73%***	2.62%	12.36%*	13.24%***
#3 Low risk & high cost hh	25.37%	80.60%	95.52%	55.22%	64.18%	67.16%	25.37%
Δ (#3-#1)	–3.19%	35.86%***	48.84%***	15.42%*	19.68%**	27.60%***	10.73%
#4 High risk & high cost hh	28.57%	71.43%	95.24%	71.43%	47.62%	38.10%	33.33%
Δ (#4-#1)	0.01%	26.69%*	48.56%***	31.62%**	3.12%	–1.47%	18.69%

*Source: Pro-MHI-Africa household data. N = 1428 households. Bonferroni multiple-comparison test, significance level: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

Above, more detailed analysis confirmed the hypothesis that high-risk households built their set of SRM strategies on a longer term, while those low/medium risk households facing high costs more rapidly changed their SRM-related behavior. In the case of high costs for low/medium risk households, the use of several SRM strategies was heavily increased (compared to group #1) and exceeded the use by high-risk & high cost households in some strategies: credit use, savings use, multiple income earners and decision-making roles in community associations. While the first three strategies were more likely to be reactive strategies, the increased use of decision-making roles for those households could be considered a proactive strategy. In comparison, high-risk & high cost households more often used health insurance, income diversification and high household activity levels in community associations, compared to low/medium risk households facing high costs. These findings referred back to hypothesis H_{3c}, regarding the hypothesized relationship that high-risk exposure of households

led to higher application of pro-active SRM strategies, compared to other groups. Generally, the hypothesis was confirmed. Additionally, through this analysis, it was confirmed that high-risk households did not significantly change (or did not have to change) their SRM-related behavior when faced with high costs. However, the hypothesis could not necessarily be confirmed with regard to low/medium risk households that faced high costs. While the higher use of the strategies *health insurance*, *income diversification* and *high activity levels in community associations* among high-risk households pointed in this direction, the fact that low/medium risk households facing high costs more often had *decision-making roles in community associations* did not support this hypothesis. On the other hand, the lower use of the – assumingly – ad hoc and reactive strategies *use of credit* and *multiple income earners* by high-risk & high-cost households, compared to low/medium risk households facing high-costs, supported the hypothesis. The differences between the two groups, regarding the use of single SRM strategies, was not significant.[658]

Tab. 44: High-risk / high-cost hh and complexity of SRM strategies by country

	Ghana	Malawi
	mean (median) SRM strategies	mean (median) SRM strategies
#1 Low/medium risk and cost household	3.16 (3)	2.20 (2)
#2 High-risk, but low/medium cost household	4.19*** (4)	2.94** (3)
#3 Low/medium risk but high-cost household	4.18*** (4)	4.10*** (4)
#4 High-risk&high-cost-household	4.11 (4)	3.67** (4)

*Source: Pro-MHI-Africa household data. N = 1428 households, Ghana N=600, Malawi N=828. Bonferroni multiple-comparison test (base: #1), significance level: * p < 0.10, ** p < 0.05, *** p < 0.01.*

In table 44 the application of SRM strategies was broken down by country and the high risk / high cost status of the household. In both countries, low/medium risk households applied highly significantly more SRM strategies when they faced high costs. High-risk households, even when they did not experience high costs, applied significantly more SRM strategies on average than low/medium risk households who also did not face high costs. Comparing high-risk households who faced high costs with those that did not was not significant in neither country (Bonf., p=1.00). Hence, the country-specific analyses confirmed the general findings.

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[658] Both groups were rather small: Group #3: 67 households, group #4: 21 households. Testing single SRM strategies between the two groups with Kolmogorov-Smirnov test also did not show significant results.

Tab. 45: Use of SRM strategies in relationship to high-risk and high-costs in Ghana

Relationship of high-risk and high-cost	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
#1 Low/medium risk and low/medium cost household	66.67%	38.79%	56.57%	58.99%	53.74%	28.48%	12.73%
#2 High-risk, but low/medium cost hh	86.76%	52.94%	76.47%	70.59%	55.88%	47.06%	29.41%
Δ (#2-#1)	20.10%***	14.15%	19.90%***	11.60%	2.15%	18.57%**	16.68%***
#3 Low/medium risk but high-cost household	53.57%	71.43%	92.86%	75.00%	67.86%	42.86%	14.29%
Δ (#3-#1)	−13.10%	32.64%***	36.29%***	16.01%	14.12%	14.37%	1.56%
#4 High-risk&high-cost-household	66.67%	88.89%	100.00%	77.78%	44.44%	11.11%	22.22%
Δ (#4-#1)	0.00%	50.10%**	43.43%**	18.79%	−9.29%	−17.37%	9.49%

*Source: Pro-MHI-Africa household data. Households in Ghana, N=600. Bonferroni multiple-comparison test (base: #1), significance level: * p < 0.10, ** p < 0.05, *** p < 0.01.*

Analog to table 43, tables 45 and 46 analyzed the effect of household's high risk / high cost status on the application of SRM strategies more in detail, but split by country.

Tab. 46: Use of SRM strategies in relationship to high-risk and high-costs in Malawi

Relationship of high-risk and high-cost	Health insurance	Credit use	Savings use	Income diversification	Multiple income earners	Decision-making role	High hh activity level
#1 Low/medium risk and low/medium cost household	3.10%	48.72%	40.08%	26.99%	38.33%	46.96%	15.92%
#2 High-risk, but low/medium cost hh	2.78%	72.22%	58.33%	44.44%	30.56%	61.11%	25.00%
Δ (#2-#1)	−0.33%	23.50%**	18.25%	17.45%	−7.77%	14.15%	9.08%
#3 Low/medium risk but high-cost household	5.13%	87.18%	97.44%	41.03%	61.54%	84.62%	33.33%
Δ (#3-#1)	2.02%	38.46%***	57.35%***	14.04%	23.21%**	37.65%***	17.41%**
#4 High-risk&high-cost-household	0.00%	58.33%	91.67%	66.67%	50.00%	58.33%	41.67%
Δ (#4-#1)	−3.10%	9.62%	51.59%***	39.68%**	11.67%	11.37%	25.74%

Source: Pro-MHI-Africa household data. Malawian households N = 828.
*Bonferroni multiple-comparison test (base: #1), significance level: * p < 0.10, ** p < 0.05, *** p < 0.01.*

Comparing the differences between Ghana and Malawi in the SRM-related behavior of high-risk households that did not encounter high costs (#2) and low/medium risk households that did not encounter high costs (#1), substantial differences could be observed. While the use of five out of the seven SRM strategies increased when a household was at high-risk in Malawi, only the increase in credit use (+23.50 percentage points) was statistically significant. In Ghana, on the other hand, high-risk households, even without high cost exposure, significantly increased the use of health insurance (+20.10%), savings (+19.90%), decision-making roles (+18.57%) and high household activity levels (+16.68%). No significant differences were detected in either country between those high-risk households (#4) that incurred high costs compared to high-risk households that did not (#2). These results were consistent with the international view in table 43. Again, these results indicated that the household's awareness of the potential for high health risks went along with building more complex sets of SRM strategies. This was the case in Malawi (although only the difference in credit use was significant), but particularly true in Ghana. With regard to the use of health insurance, the use in Malawi was very low in both groups (#2 and #1), but there was a large increase in health insurance use in the group high-risk, low-cost households (+20.10%) in Ghana. This could have been either the result of adverse selection that high-risk households were more likely to become members of a health insurance scheme, or it was the result of better access to health care and, with it, better diagnosis of chronic conditions and improved access to inpatient care.

Similar to the findings in table 43, low/medium-risk households that were exposed to high costs (group #3) drastically changed SRM-related behavior, compared to low/medium-risk households that did not experience high costs (group #1): In Malawi, a substantial number of SRM strategies (five out of seven) showed a significant increase: Credit use (+38.46%), savings use (+57.35%), multiple income earners (+23.21%), decision-making roles (+37.65%), high household activity in community-associations (+17.41%). In Ghana, on the other hand, only credit (+32.64%) and savings use (+36.29%) increased significantly.

There were no significant differences in either country regarding the use of SRM strategies between high-risk households facing high costs (group #4) and low/medium-risk households facing high costs (#3). Generally, it should be noted that the entire high-risk and high-cost group was a rather small sub-group (9 households in Ghana, 12 households in Malawi) and, therefore, not all differences showed statistical significance. Looking in more detail at group #3, one can see that apparently low/medium-risk households could mobilize a substantial number of SRM strategies when faced

with high costs, although the strongest increases were among credit and savings. This was consistent in both countries.

Analyzing the interactions of the high-risk and high-cost household variables with the applied social risk management strategies, allowed for a more detailed discussion of hypothesis H_{3e}. The hypothesis stated that high-cost households who were also high-risk households had a significantly different set of SRM strategies, compared to other high-cost households. The first part of the hypothesis was not confirmed, as no significant difference in the complexity of SRM sets could be found between high-risk & high-cost households and low/medium risk households facing high costs. In fact, the mean in complexity of SRM strategy sets of the latter group was even slightly higher. With regard to the use of the single SRM strategies, no significant differences could be found between high risk & high cost households and low/medium risk households facing high costs. There were variations between the two groups in both the general and in the country-specific analyses, but these differences remained insignificant. Hence, hypothesis H_{3e} was rejected.

7.4.6. Multivariate analysis on complexity of SRM strategies

After the bivariate analysis of the complexity of SRM strategies, five multivariate OLS regression models were estimated, three models (1a-1c) that added variables step-wise (see table 47), and two country-specific regression models (table 48). While the first model 1a (adj. R^2 28.6%) included core household characteristics and variables related to the socio-economic status of the household,[659] model 1b added risk exposure and risk experience variables (adj. R^2 35.1%).[660] Model 1c added perception variables and insurance-related variables (adj. R^2 36.6%).[661] Since the distribution of the dependent variable was not skewed and the homoscedasticity assumption was not violated, standard OLS estimators were used.[662] All indicators in the five estimated models showed a negligible level of collinearity, so that no further adjustments had to be made.[663]

Model 1a showed that a variety of household characteristics influenced the complexity of applied SRM strategies. First of all, the country variable was highly significant; Malawi showed a 0.776 points lower complexity in SRM strategies than in Ghana. Since health insurance was one of the factors used for the SRM complexity index, this

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[659] Specification of model 1a: F(11,1416)=52.89, p<0.001.
[660] Specification of model 1b: F(19,1408)=41.65, p<0.001.
[661] Specification of model 1c: F(24,1403)=35.27, p<0.001.
[662] The null hypothesis of the Breusch-Pagan test (model 1c) for heteroscedasticity had to be rejected (χ^2(1)=0.02, p=0.8939). The test for normality showed an insignificant level of skewness (p=0.2028).
[663] In the Ghana regression model 1c, the factor *region* had a VIF of 6.58, which was still negligible, but was again a sign for relationship between predominant type of religion and region in Ghana.

could be largely attributed to the existence of the NHIS in Ghana. This country differ-
ence was highly significant in all three general models 1a-1c. A consistently significant
level in all general models was also found in the educational level of the head of house-
hold; an increase by one educational level increased the SRM complexity by 0.140 in
model 1a and 0.099 in model 1c. The difference in the complexity of SRM sets between
religions was highly significant: A predominantly Muslim household was related to an
increase of 0.553 in model 1a and 0.316 in model 1c, but belonging to another religion
did not show a significant relationship. Household size was also consistently highly
significant and positively associated with SRM complexity, as one additional household
member increased complexity by 0.188 in model 1a and 0.176 in model 1c. Total house-
hold income was another consistent factor which was highly significant in all three
general models: If a household reached a higher income quintile, the SRM complexity
increased by 0.318 in model 1a and by 0.297 in model 1c. Household wealth levels were
not significant in any of the general models. The use of more complex sets of SRM
strategies seemed to be more income-dependent and less wealth-dependent. Appar-
ently, income improved access to other SRM strategies, while wealth could be seen as
an SRM strategy itself, by accumulating assets.

Several factors added in model 1b proved to be significant, which indicated that the
factors related to risk exposure and health care provider choice influenced the social
risk management behavior. If the primary health care facility normally used was a pri-
vate facility, this had a significant positive effect on the complexity of applied SRM
strategies by 0.250 points in model 1b and 0.216 points in model 1c. An increase by one
point in satisfaction with the quality of health care (measured on a five-point Likert
scale) increased the complexity of SRM strategies by 0.088 in model 1b and 0.076 in
model 1c. Both high-cost experience and high-risk experience of households were
highly significant factors for an increase in SRM strategies: If a household belonged to
the high-cost group, the complexity of applied SRM strategies went up by 0.661 in
model 1b and 0.668 in model 1c. An increase in one unit[664] of the high-risk status of a
household produced an increase in the complexity in SRM strategies by 0.661 in model
1b and 0.668 in model 1c. The household exposure to general risks (last three years)
had a significant positive relationship with the SRM complexity, so that one additional
general risk to which the household was exposed, increased the SRM complexity by
0.0987 in model 1b and 0.0859 in 1c.[665] As mentioned above, several villages or commu-

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[664] As mentioned above, the high-risk variable had a value range from 0 to 1 with four categories in
total.
[665] The variable *household exposure to general risks* had a value range from 0 to 11 and a mean of 2.76,
sd 2.09.

nities had an extraordinarily high general risk exposure. The village-level risk exposure had a significant positive relationship with the use of SRM strategies. A one point increase in the variable *villages classified by general risks* increased the complexity of SRM strategies by 0.250 in model 1b and 0.216 in model 1c.[666] Model 1c that added variables on risk and insurance perception slightly increased the adj. R^2, by 1.5 percentage points to 36.6%. The variable *self-perceived relative household exposure to general risks compared to other households in the community* (measured on a five point Likert scale) showed a highly significant, but negative relationship with SRM complexity; a one point increase of this relative risk exposure decreased the SRM complexity by 0.109. This subjective measure could have been an indication of some form of desperation and, therefore, a stronger reliance on reactive SRM strategies and limited access to proactive strategies.[667] The variables on *perception of health insurance as a risk management tool* (0.188) and *knowledge of the functioning of health insurance* (0.272) were significantly associated with a higher complexity of SRM strategies and may have served as a proxy of general risk awareness of the household.

Tab. 47: Determinants of SRM set complexity (multivariate linear regression)

	Model 1a		Model 1b		Model 1c	
Country Malawi (base: Ghana)[c]	−0.776[***]	(0.0888)	−0.704[***]	(0.0946)	−0.658[***]	(0.0975)
Household environment: urban/semi-urban (base:rural)[b,c]	0.0893	(0.0855)	0.0977	(0.0865)	0.111	(0.0856)
Age of head of household	0.00548[*]	(0.0033)	0.000126	(0.0032)	−0.00071	(0.0032)
Female head of household[b]	0.109	(0.1052)	0.0349	(0.1007)	0.0303	(0.0998)
Education level of head of household	0.140[***]	(0.0486)	0.125[***]	(0.0465)	0.0987[**]	(0.0463)
Predominant religion: Muslim[c] (base: Christian)	0.553[***]	(0.1051)	0.317[***]	(0.1140)	0.316[***]	(0.1131)
Predominant religion: Other[c] (base: Christian)	−0.113	(0.2502)	−0.140	(0.2398)	−0.108	(0.2376)
Household size	0.188[***]	(0.0202)	0.176[***]	(0.0197)	0.176[***]	(0.0195)
Child/adult ratio	−0.0357	(0.0441)	−0.0453	(0.0421)	−0.0446	(0.0417)
Wealth index (quintiles)	0.00545	(0.0342)	0.0289	(0.0329)	−0.00511	(0.0332)
Total monthly hh income (quintiles)	0.318[***]	(0.0306)	0.300[***]	(0.0293)	0.297[***]	(0.0291)

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[666] The value range of *villages classified by general risks* could take the values −1, 0, 1. Seven villages with 237 households were classified as villages with clustered high general risk exposure. Nine villages had a clustered general risk exposure below average comprising 70 households. The other 188 villages were classified to have normal risk exposure, comprising 1119 households.

[667] The mean SRM complexity of households rating themselves to be more or much more exposed to risks compared to other households was at 2.61, while the mean of the other households was 2.80.

	1a coef	1a SE	1b coef	1b SE	1c coef	1c SE
Type of primary health care facility: private (base: public or charitable)[c]			0.250**	(0.0984)	0.216**	(0.0982)
Satisfaction with quality of care[l,z]			0.0882***	(0.0319)	0.0762**	(0.0318)
Villages classified by general risks			0.258**	(0.1134)	0.216*	(0.1136)
Distance to the closest hospital			0.00943	(0.0377)	0.0129	(0.0375)
Average illness events per hh member			0.930***	(0.1533)	0.901***	(0.1524)
High cost household[b]			0.694***	(0.1562)	0.682***	(0.1546)
High risk household			0.661***	(0.1688)	0.668***	(0.1678)
Exposure to number of general risks			0.0870***	(0.0194)	0.0859***	(0.0195)
Self-perceived relative risk exposure[l,z]					−0.109***	(0.0336)
Willingness to take risks[l,z]					−0.00171	(0.0259)
Insurance knowledge[b]					0.272***	(0.0820)
Acknowledgment of insurance as risk management tool[b]					0.188**	(0.0824)
Likelihood of community assistance[l,z]					0.0394	(0.0272)
Constant	0.561**	(0.2259)	0.223	(0.2664)	0.00911	(0.2670)
Observations	1428		1428		1428	
Adjusted R^2	0.286		0.351		0.366	

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Dependent variable: Complexity of SRM strategies
Notes: [b]=binary/dichotomous variable, [c]=categorical variable, [l]= likert scale, [q]= quintiles, [z]= centered variable.

Testing the contribution of the variables to the explained variance of the three general models, in model 1a four variables were identified to substantially contribute: Income quintiles showed a medium effect (ω^2=0.0704); a small to medium effect was shown by the variables *country* (ω^2=0.0504) and *household size* (ω^2=0.0569); and a small effect by Muslim *religion* (ω^2=0.0185). Analyzing the effect sizes in model 1c (the results of which are similar but slightly lower than model 1b) showed that the contribution by religion was reduced. In total, in model 1c, seven variables substantially contributed to the explained variance: The income quintiles maintained a medium effect size (ω^2=0.0685) and *household size* remained at a small to medium effect size (ω^2=0.0544). The other five variables showed a small effect: *household country* (ω^2=0.0307), *average*

illness episodes per hh member (ω^2=0.0236), *household general risk exposure* (ω^2=0.0130), *high-cost household* (ω^2=0.0130) and *high-risk households* (ω^2=0.0105).

The model 1c split by country showed quite similar patterns in Ghana and Malawi; the explanatory power of the country-specific models was also comparable (see table 48).[668] A variety of variables from the general model 1c remained significant factors in the country-specific models: Household size (Gh: 0.125, Mw: 0.211), total monthly household income (Gh: 0.204, Mw: 0.335), average illness events per hh member (Gh: 0.899, Mw: 0.905), high-cost household (Gh: 0.429, Mw: 0.841), high-risk households (Gh: 0.803, Mw: 0.467), household exposure to general risks (Gh: 0.0925, Mw: 0.0742) and with a negative relationship, self-perceived relative risk exposure (Gh: –0.100, Mw: –0.0951). Overall, this showed a high consistence between the country-specific models and the general model. However, there were also differences between the general models 1c and the Ghanaian or Malawian model. While the *risk level of villages* lost significance in both country models, *satisfaction with health care providers* remained significant only in Ghana. A number of variables lost significance in the Ghanaian model, while retaining a significant level in Malawi: *Educational level of the head of household*, *Muslim religion*, *use of private primary providers*, *health insurance knowledge* and *health insurance perception*. Contrary to the general model 1c, the *household environment* gained significance in the Malawian model showing a higher SRM complexity for urban/semi-urban households. In Ghana, on the other hand, several household-related variables became significant and were inversely related to SRM complexity: The *age of the head of household*, having a *female head of household*, and high *child/adult ratio* were associated with a lower SRM complexity. Also, in Ghana, the *willingness to take risks* and the *likelihood of community assistance* became significant and were positively associated with SRM complexity.

Tab. 48: Determinants of SRM set complexity: country comparison (multivariate linear regression)

	Model 1c: Ghana		Model 1c: Malawi	
Region of household (base MW: Central region, base GH: Greater Accra region)	0.356	(0.2549)	0.0402	(0.1217)
Household environment: urban/semi-urban (base:rural)[b,c]	–0.116	(0.1323)	0.294[**]	(0.1230)
Age of head of household	–0.00790[*]	(0.0041)	0.00669	(0.0048)
Female head of household[b]	–0.367[**]	(0.1434)	0.200	(0.1387)

[668] Specification of the Ghana regression model: $F_{(24,575)}$=13.32, p<0.001, and the Malawi model: $F_{(24,803)}$=18.06, p<0.001.

Education level of head of household	0.0477	(0.0605)	0.114[*]	(0.0687)
Predominant religion: Muslim[c] (base: Christian)	−0.0797	(0.1792)	0.338[*]	(0.1850)
Predominant religion: Other[c] (base: Christian)	−0.438	(0.3731)	0.0930	(0.3068)
Household size	0.125[***]	(0.0256)	0.211[***]	(0.0304)
Child/adult ratio	−0.126[**]	(0.0639)	−0.00521	(0.0550)
Wealth index (quintiles)	−0.0519	(0.0471)	−0.00281	(0.0494)
Total monthly hh income (quintiles)	0.204[***]	(0.0418)	0.335[***]	(0.0413)
Type of primary health care facility: private (base: public or charitable)[c]	0.0761	(0.1604)	0.241[*]	(0.1285)
Satisfaction with quality of care[l,z]	0.186[***]	(0.0610)	0.0246	(0.0388)
Villages classified by general risks	0.0207	(0.0561)	−0.00462	(0.0543)
Distance to the closest hospital	0.0834	(0.1918)	−0.133	(0.1936)
Average illness events per hh member	0.899[***]	(0.2210)	0.905[***]	(0.2086)
High cost household[b]	0.429[*]	(0.2196)	0.841[***]	(0.2120)
High risk household	0.803[***]	(0.2112)	0.467[*]	(0.2622)
Exposure to number of general risks	0.0925[***]	(0.0246)	0.0742[**]	(0.0298)
Self-perceived relative risk exposure[l,z]	−0.100[*]	(0.0600)	−0.0951[**]	(0.0422)
Willingness to take risks[l,z]	0.0915[**]	(0.0414)	−0.0463	(0.0352)
Insurance knowledge[b]	0.178	(0.1266)	0.244[**]	(0.1100)
Acknowledgment of insurance as risk management tool[b]	−0.0483	(0.1142)	0.335[***]	(0.1187)
Likelihood of community assistance[l,z]	0.0735[*]	(0.0434)	0.000407	(0.0366)
Constant	0.662	(0.8940)	−1.646[***]	(0.3597)
Observations	600		828	
Adjusted R^2	0.331		0.331	

Standard errors in parentheses. [*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$
Dependent variable: Complexity of SRM strategies
Notes: [b]=binary/dichotomous variable, [c]=categorical variable, [l]= likert scale, [q]= quintiles, [z]= centered variable.

The estimated regression models revealed some relevant factors that added to the explained variance. Consistently, in both countries, the factor of the *household income quintile* represented a small effect ($\omega^2=0.0381$) in Ghana and a medium effect ($\omega^2=0.7467$) in Malawi. Also, *household size* showed a small effect ($\omega^2=0.0382$) in Ghana, but a small to medium effect ($\omega^2=0.0553$) in Malawi. Small effect sizes in both countries were detected for the *average number of illness episodes per household member,* in Ghana $\omega^2=0.0263$ and in Malawi $\omega^2=0.0217$. *High-risk households* only substantially contributed to the explained variance in Ghana ($\omega^2=0.0228$), while the effect size in Malawi was negligible ($\omega^2=0.0026$). Also, the factors *satisfaction with health care providers* ($\omega^2=0.0143$) and *severe general non-health related risk exposure* ($\omega^2=0.0223$) were only relevant in Ghana. On the other hand, the (small) effect size of *high-cost households* remained relevant in Malawi ($\omega^2=0.0180$), but not in Ghana ($\omega^2=0.0048$).

The multivariate analysis confirmed most of the hypotheses that were already discussed in the sections 7.4.1-7.4.5. Most factors tested in hypothesis H_{3a} remained significant in the multivariate models: *Household country* (Ghana was related to more complex sets of SRM strategies), *household size*, *religion* and the *educational level of the head of household*. The *household wealth level* was not significant in the multivariate models, but the *household income level* showed a highly significant relationship in all five regression models. The hypotheses H_{3b} stating that high-risk households used more complex sets of SRM strategies and the hypothesis H_{3d} stating that high-cost households applied more complex SRM strategies were both confirmed in the multivariate analysis. Hypothesis H_{3b} was also confirmed for high exposure to general risks. In terms of risk exposure, the *average illness episodes per household member* was also highly significant and positively associated with the *complexity of SRM strategy sets* in all five models.

7.5. Health insurance as SRM strategy and demand for health insurance

7.5.1. Willingness to pay for health insurance

As described in section 5.2.2, the measure willingness to pay (WTP) is a proxy for the demand for the health risk management strategy *health insurance* and corresponded to the maximum willingness to pay for a hypothetical health insurance product by the household head. The variable used in the analysis referred to the WTP for health insurance per individual in the household. As described in section 6.3, the distribution of the dependent variable on WTP was heavily right-skewed. Therefore, the natural loga-

rithm of the variable (after conversion of the local currencies to Euro) was calculated, in order to create a standard normal distributed outcome variable, which reduced the level of heteroscedasticity,[669] and, therefore, allowed for normally distributed residuals in the regression model.[670] After the log transformation, the Breusch-Pagan test, a test for heteroscedasticity, still suggested heteroscedastic variances.[671] Therefore, the Huber/White sandwich estimator was used in all regression models, instead of the typically used ordinary-least-square estimation, as it produced more robust estimates and reduced heteroscedasticity.[672] Variance inflation factors were calculated in order to detect collinearity, but no substantial collinearity was detected for all six regression models on WTP.

Table 49 shows the three general regression models 1a-1c that introduced variables step-wise, while table 50 adds the general regression model 2, including all factors and the two country-specific regression models.[673] A variety of factors significantly influenced the willingness to pay for health insurance per individual in the household. Model 1a tested household-specific variables and variables that were directly linked to the applied WTP elicitation method. The willingness to pay level in the dependent variable referred to the highest accepted price in the bidding game, per individual in the household, and was the division of the total household WTP divided by the number of members that the respondent (usually the head of household) intended to insure. Hence, the variable *share of household members to be insured* had to be included in the models as a control variable, because a higher share increased the total household expenditure on health insurance and, therefore, was an important factor.[674] Hence, a negative relationship with the WTP per person was assumed. This assumption was confirmed by the four general regression models (1a-2) that showed that an increase in the share of household members decreased the WTP per person by 100.3% in model 1c and

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[669] Kohler et al. (2008): Datenanalyse mit Stata, p. 238.

[670] Due to the log transformation, the interpretation of the regression coefficients changed, see section 6.3.

[671] The null hypothesis of the Breusch-Pagan H_0: constant variances (= homoscedasticity) had to be rejected, because the p-value is close to 0, ($\chi^2(1)=7.27$, p=0.0070).

[672] Fahrmeir et al. (2009): Regression, p. 131 and 135f; Stata Press (ed.) (2013): Stata user's guide release 13, p. 309f.

[673] Specification of model 1a: $F(10,1397)=24.66$, p<0.001, $R^2=0.1701$, Adj. $R^2=0.164$.
Specification of model 1b: $F(19,1388)=19.73$, p<0.001, $R^2=0.2279$, Adj. $R^2=0.217$.
Specification of model 1c: $F(24,1383)=18.44$, p<0.001, $R^2=0.2494$, Adj. $R^2=0.236$.

[674] The variable on the share of household members to be insured ranged from 0 to 4. Hence, some respondents aimed to insure more individuals than the definition of the household in the questionnaire defined. However, out of 1415 households, only 24 aimed to insure a larger share than 1. The mode of the distribution was 1, which was reported by 996 respondents. The mean was 0.87 and the median was 1.

95.4% in model 2.[675] A positive response to the control question, whether the household would buy the health insurance product at the final WTP price if the product existed, was positively associated with the WTP level; a one unit change increased the WTP level by 31.3% in model 1c and 33.9% in the model 2. This means that those households that did not express the intention to purchase the product at the final bid were more likely to give lower WTP levels than the other households.[676]

Tab. 49: Determinants of Willingness to Pay (multivariate linear regression)

	Model 1a		Model 1b		Model 1c	
Share of hh members intended to be insured	−1.029***	(0.1821)	−1.027***	(0.1652)	−1.003***	(0.1657)
Accepting to buy insurance at WTP price level[b]	0.345*	(0.1785)	0.353**	(0.1702)	0.313*	(0.1710)
Country Malawi (base: Ghana)[c]	−0.115	(0.0826)	−0.134	(0.0939)	−0.107	(0.0950)
Age of head of household	−0.00314	(0.0027)	−0.00362	(0.0026)	−0.0052*	(0.0027)
Female head of household[b]	0.149*	(0.0869)	0.236***	(0.0849)	0.212**	(0.0830)
Education level of head of household	0.195***	(0.0358)	0.113***	(0.0390)	0.117***	(0.0385)
Household size	−0.110***	(0.0160)	−0.0764***	(0.0205)	−0.0704***	(0.0205)
Predominant religion: Muslim[c] (base: Christian)	−0.471***	(0.0874)	−0.288***	(0.0921)	−0.302***	(0.0926)
Predominant religion: Other[c] (base: Christian)	−0.279	(0.2087)	−0.227	(0.1966)	−0.168	(0.2009)
Child/adult ratio	−0.0363	(0.0335)	0.00278	(0.0334)	0.00454	(0.0328)
Income diversification			−0.234***	(0.0487)	−0.228***	(0.0484)
Share of hh members contributing significantly to the income			0.819***	(0.1925)	0.842***	(0.1912)
Wealth index (quintiles)			0.0839***	(0.0269)	0.0800***	(0.0265)
Total monthly hh income (quintiles)			0.119***	(0.0246)	0.108***	(0.0240)
Type of primary health care facility: private (base: public or charitable)[c]			0.0968	(0.0844)	0.125	(0.0845)
Satisfaction with quality of care[l,z]			0.0788***	(0.0251)	0.0637**	(0.0254)
Household environment: urban			−0.177**	(0.0704)	−0.149**	(0.0705)

[675] Regarding the interpretation of coefficients in a regression model with a log transformed dependent variable, see section 6.3 on the WTP variable.

[676] 43 (3.0%) of households indicated that they would not buy the insurance product at the final bid, out of 1428 households.

(base:rural)[b,c]						
Villages classified by general risks			-0.177^{**}	(0.0833)	-0.0781	(0.0890)
Distance to the closest hospital			0.0390	(0.0319)	0.0414	(0.0321)
Average illness events per hh member					0.370^{***}	(0.1383)
High cost household[b]					0.0790	(0.1111)
High risk household					0.484^{***}	(0.1440)
General risks exposure					-0.0641^{***}	(0.0168)
Willingness to take risks[l,z]					0.0466^{**}	(0.0217)
Constant	0.553^{*}	(0.2897)	0.0243	(0.3299)	0.0816	(0.3361)
Observations	1408		1408		1408	
Adjusted R^2	0.164		0.217		0.236	

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable: Logarithm of household willingness to pay in Euro equivalent (per person that is intended to be insured)
Notes: ^{b}=binary/dichotomous variable, ^{c}=categorical variable, ^{l}= likert scale, ^{q}= quintiles, ^{z}= centered variable

Several household-related variables showed a significant relationship with the WTP per individual. Urban households showed a 14.9% (model 1c) and 14.4% (model 2) lower WTP level, compared to rural or semi-urban households. The household located in a *village classified to be highly exposed to general risks* was only significant in model 1a, where it showed a negative relationship. The age of the head of household was not significant in the models 1a and 1b, but became significant in the more comprehensive models. The relationship was negative and, with every additional year of age, the WTP level per individual decreased by 0.58% in model 1c and 0.76% in model 2. The educational level of the head of household, on the other hand, was consistently significant in all models. One additional level increased the dependent variable by 11.7% in model 1c and 10.7% in model 2. Consistently, in all regression models, a female head of household showed a significant positive relationship which increased the WTP by 21.2% in model 1c and by 20.3% in model 2. Another household determinant was the household size, which had a significant negative relationship in all general models, so that each additional household member decreased the WTP, per individual, by 7.04% in model 1c and by 6.71% in model 2. Also, the predominant religion of the household, Islam compared to Christianity, had a significant negative relationship with the WTP per individual in all three general models, but lost significance in both country-specific models; in the general model 1c, being predominantly Muslim reduced the WTP level by 30.2% and by 23.7% in model 2. The country of the household was insignificant in all

general models except for model 2, where households in Malawi showed a 23.9% lower WTP level per individual.

Model 1b added variables related to the economic status of the household and health infrastructure-related variables. Both the wealth level of the household and the income level were positively related to the level of WTP per individual, in all general models. A one quintile higher wealth level increased the WTP by 8.0% in model 1c and 5.3% in model 2. The income level of the households had a stronger relationship than the wealth level, as one quintile higher household income level increased the WTP level by 10.80% in model 1c and 10.3% in model 2. Also, the *share of household members who contribute significantly to the household income* was positively associated with the WTP level, which was significant in all general models: a one unit increase of this variable increased the WTP level by 84.2% in model 1c and 70.6% in model 2.[677] Only one facility-related variable showed consistently significant coefficients, which was the *satisfaction level with quality of care*: A one step increase on the five-point Likert scale increased the WTP level by 6.4% in model 1c and 6.5% in model 2. This was not surprising, as the quality of health care increased or decreased the value of a health insurance product.

Several risk exposure variables on the household-level were added to model 1c. While *high-cost households* did not show a significant relationship with WTP levels, the household experience with illness episodes (*average illness events per household member*) was highly significant in the models 1c and 2. A one unit increase in the household average increased the WTP level by 37.0% in model 1c and 49.1% in model 2. *High-risk households* were highly significant in all regression models, including the country-specific models, showing a positive relationship: A one unit increase in the high-risk status increased the WTP by 48.4% (model 1c) and 54.9% (model 2). On the other hand, *household exposure to general risks in the last three years* reduced the willingness to pay level, a one unit increase in general risk exposure reduced the WTP level by 6.41% in model 1c and 6.73% in model 2.

Model 2 added a variety of variables related to SRM strategies in order to test the relationship of other SRM strategies with the demand for health insurance, with WTP as proxy. Those SRM strategies which were a potential alternative to health insurance had a negative relationship with the WTP level. This was the case for the proactive strategy of risk diversification, in the form of the four scale variable *income diversification*

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[677] A one unit increase in the variable *share of household members contributing significantly to the income* was logically almost impossible. The value range of the variable was from 0 to 1, but only two households indicated to have no income earner and the 5% percentile was at a share of 12.5% of hh members.

which was highly significant in all models: A one unit increase reduced the WTP level by 20.3% in model 2. The variables representing risk mitigation strategies were also negatively related: a one unit change in the attitude variable *likelihood of community assistance*[678] related to a decrease in WTP by 7.4% and the *household use of savings* in a decrease of 16.5%. Also, the SRM strategy *household use of credit/loans* had a negative relationship, as it reduced the WTP by 25.7%. Hence, there seemed to be some substitutive effect between the other SRM strategies and WTP for health insurance, so that the application of the other SRM strategies crowded out the demand for health insurance. On the other hand, the variable *household activity level in community associations*[679] was highly significant and positively related (change in WTP by +55.0%), as was the membership in microfinance institutions (change in WTP by +22.4%). Likewise, the variable *existence of insurance knowledge* was positively related to WTP levels (+11.2%) as well as the variable *acknowledgment of insurance that it can help to pay for costly treatments* (+13.4%). Households that were insured for health showed the tendency (not significant) of a negative relationship with the WTP level, compared to those households without insurance.

As already discussed above, the experience with health insurance strongly differed between Ghana and Malawi. For this reason, a country comparison of willingness to pay levels (see table 50) displayed many differences between the two countries.[680]

A variety of factors in the country-specific regression models were consistent with the four general models, in terms of direction of relationship and significance: The *age of the head of household*, which was significant in general models 1c and 2, was negatively related, so that one additional year decreased the WTP by 0.76% in Ghana and by 0.68% in Malawi in model 2. Also, consistent with the general models were the following variables:[681] The *educational level of the household head* (Gh: +11.3%, Mw. +10.1%), *high-risk household* (Gh: +80.4%, Mw. +37.2%), *general risk exposure* (Gh: −6.6%, Mw: −7.3%), the *level of income diversification* (Gh: −17.3%, Mw: −15.4%) and the *activity level in community associations* (Gh: +91.0%, Mw: +33.3%). However, some significant factors in the general models lost significance in both country-specific models: *predominant religion of the household*, *insurance knowledge* and the SRM strategy *use of*

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[678] The variable *likelihood of community assistance* was measured on a five-point Likert scale.

[679] The variable *household activity level in community associations* had in total three categories in a value range from 0 to 1.

[680] Specification of model 2: $F_{(33,1374)}=17.41$, $p<0.001$, $R^2=0.2818$, Adj. $R^2=0.265$.
Specification of Ghana-specific model: $F_{(32,560)}=14.88$, $p<0.001$, $R^2=0.3734$, Adj. $R^2=0.338$.
Specification of Malawi-specific model: $F_{(32,782)}=8.93$, $p<0.001$, $R^2=0.2520$, Adj. $R^2=0.221$.

[681] In brackets given is the percentage change in the dependent variable after one unit change in the independent variable.

savings. All factors that showed significant coefficients in the country-specific models did not change the sign, compared to the general models, so that the tendency of direction was always confirmed.

Tab. 50: Determinants of Willingness to Pay: Country comparison (multivariate linear regression)

	Model 2	Ghana	Malawi
Share of hh members intended to be insured	−0.954*** (0.1685)	−0.406 (0.3509)	−1.137*** (0.1369)
Accepting to buy insurance at WTP price level[b]	0.339* (0.1740)	1.424*** (0.3568)	0.140 (0.1707)
Country Malawi (base: Ghana)[c]	−0.239* (0.1236)		
Age of head of household	−0.00758*** (0.0027)	−0.0125*** (0.0037)	−0.00678* (0.0039)
Female head of household[b]	0.203** (0.0819)	0.278* (0.1449)	0.0918 (0.0968)
Education level of head of household	0.107*** (0.0384)	0.113** (0.0565)	0.101** (0.0500)
Household size	−0.0671*** (0.0202)	−0.0354 (0.0271)	−0.103*** (0.0279)
Predominant religion: Muslim[c] (base: Christian)	−0.237*** (0.0914)	−0.193 (0.1580)	−0.227 (0.1420)
Predominant religion: Other[c] (base: Christian)	−0.128 (0.1974)	−0.373 (0.4012)	−0.0528 (0.1777)
Child/adult ratio	−0.00268 (0.0332)	0.0369 (0.0704)	−0.0407 (0.0335)
Income diversification	−0.203*** (0.0480)	−0.173** (0.0695)	−0.154** (0.0642)
Share of hh members contributing significantly to the income	0.706*** (0.1937)	1.230*** (0.2850)	0.153 (0.2556)
Wealth index (quintiles)	0.0527** (0.0267)	0.00601 (0.0441)	0.0786** (0.0338)
Total monthly hh income (quintiles)	0.103*** (0.0242)	0.0527 (0.0400)	0.127*** (0.0311)
Type of primary health care facility: private (base: public or charitable)[c]	0.145* (0.0856)	0.0841 (0.1568)	0.136 (0.1022)
Satisfaction with quality of care[l,z]	0.0648** (0.0255)	0.0988* (0.0591)	0.0370 (0.0274)
Household environment: urban (base:rural)[b,c]	−0.144** (0.0700)	0.0842 (0.1242)	−0.264*** (0.0790)
Villages classified by general risks	−0.0586 (0.0889)	0.121 (0.1433)	−0.217 (0.1367)
Distance to the closest hospital	0.0266 (0.0327)	0.0781 (0.0547)	−0.0344 (0.0386)
Average illness events per hh member	0.491*** (0.1419)	0.941*** (0.2540)	0.105 (0.1592)
High cost household[b]	0.109 (0.1150)	−0.123 (0.1941)	0.208 (0.1516)
High risk household	0.549*** (0.1417)	0.804*** (0.2047)	0.372** (0.1884)

General risks exposure	−0.0673*** (0.0166)	−0.0665** (0.0261)	−0.0730*** (0.0219)
Willingness to take risks[l,z]	0.0327 (0.0221)	−0.0491 (0.0396)	0.0902*** (0.0263)
Household with health insurance[b]	−0.105 (0.1043)	−0.125 (0.1204)	−0.133 (0.2235)
Insurance knowledge[b]	0.112* (0.0675)	0.177 (0.1195)	0.0966 (0.0806)
Acknowledgment of insurance as risk management tool[b]	0.134* (0.0706)	0.0208 (0.1131)	0.193** (0.0887)
Likelihood of community assistance[l,z]	−0.0740*** (0.0204)	−0.199*** (0.0368)	0.00962 (0.0261)
Membership in microfinance[b]	0.224*** (0.0775)	0.0576 (0.1470)	0.171* (0.0945)
Household use of credit/loans[b]	−0.257*** (0.0650)	−0.449*** (0.1063)	−0.110 (0.0846)
Household use of savings[b]	−0.165** (0.0683)	−0.172 (0.1165)	−0.101 (0.0843)
Decision-making role in associations[b]	0.00815 (0.0675)	−0.116 (0.1113)	0.0850 (0.0819)
Activity level in associations	0.550*** (0.1618)	0.910*** (0.2789)	0.333* (0.1914)
Constant	0.332 (0.3343)	−1.529** (0.6942)	0.820** (0.3233)
Observations	1408	593	815
Adjusted R^2	0.265	0.338	0.221

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable: Logarithm of household willingness to pay in Euro equivalent (per person that is intended to be insured)
Notes: [b]=binary/dichotomous variable, [c]=categorical variable, [l]= likert scale, [q]= quintiles, [z]= centered variable.

However, there were also substantial differences between the two countries: The household *wealth quintile* (Mw: +7.9%) and the *total household income quintile* (Mw: +12.7%) were positively related to the WTP level, which was significant in Malawi, but not in Ghana. In Ghana, the *share of hh member contributing significantly to the income* was highly significant (+123.0%), but not in Malawi. Satisfaction with quality of care was also a significant factor only in Ghana (+9.9%). On the other hand, in Malawi, the variable *household environment* was highly significant (if an urban household, the WTP was reduced by −26.4%), but without significance in Ghana. Contrary, the *average illness events per hh member* was a highly significant factor in Ghana (+94.1%), while it was insignificant in Malawi.

There were also differences in the dependency of WTP levels on SRM strategies. While the *likelihood of community-assistance* (−19.9%) and the *household use of credit/loans* (−44.9%) were highly significant in Ghana, they were not significant factors in Malawi. In Malawi, on the other hand, the *acknowledgment of insurance as risk management tool* (+19.3%) and the *membership in microfinance* (+17.1%) was significant, which were not significant factors in Ghana.

In the estimated regression models on WTP levels, a variety of factors substantially added to the explained variance of the models. For better comparability, only the Ω^2 values of model 2 and the two country models were presented and discussed. Analyzing the factors substantially contributing to the explained variance manifested substantial differences between Ghana and Malawi, because none of the factors had a relevant effect size in both countries. First, the effect sizes of the factors in the general model 2 are presented, in order to be able to contrast them with the country-specific results.

In model 2, the *share of household members intended to be insured*, a factor internal to the WTP evaluation method, had the strongest, but still a small negative effect size ($\omega^2=0.0457$). Five other factors were relevant and showed a small effect size: A negative relationship was seen in *income diversification* ($\omega^2=0.0122$), *general risk exposure* ($\omega^2=0.0110$) and household *use of credit/loans* ($\omega^2=0.0107$). A positive relationship, with a small effect size, could be found for the variables *total monthly household income* ($\omega^2=0.0119$) and *high-risk households* ($\omega^2=0.0104$).

The relevant factors in the Malawian model were closer to the general model than those of the Ghana-specific model. In the Malawian model, the *share of household members intended to be insured* showed a medium negative effect size ($\omega^2=0.0854$). Together with the relevance of the factor *total household income* ($\omega^2=0.0202$) and the negative relationship of the *household size* ($\omega^2=0.0160$), this could be interpreted as budgetary constraints for higher WTP levels. Another relevant factor adding to the explained variance in the Malawi-specific regression model was the factor *household environment* ($\omega^2=0.0125$), showing a small negative effect in urban households compared to rural and semi-urban households. *Exposure of the household to general risks* showed a small (negative) effect of $\omega^2=0.0145$. Only in the Malawian model, the variable *willingness to take risks* substantially added to the explained variance with $\omega^2=0.01442$.

The relevant factors for willingness to pay in Ghana were fundamentally different from those in Malawi. Two household-related factors substantially contributed to the explained variance: The *age of the head of household*, with a small negative effect size ($\omega^2=0.0162$), and the *share of household members contributing significantly to the household income*, with a small positive effect ($\omega^2=0.0270$). Two variables related to risk exposure with a small positive effect size were *high risk household*, with $\omega^2=0.0247$, and the *average illness events per hh member*, with $\omega^2=0.0273$. The application of some SRM strategies substantially added to the explained variance in the Ghana-specific model: *likelihood of community assistance* ($\omega^2=0.0397$) and *household use of credit/loans*

(ω^2=0.0287), with a small negative effect size, while the *household activity level in community associations* showed a small positive effect size (ω^2=0.0202).

Relationships with the WTP level have been hypothesized for risk exposure variables, several SRM strategies and socio-economic characteristics. Hypothesis H_{4a}, stating a positive relationship of *household wealth quintiles* and *household income quintiles* with WTP, was generally confirmed. Both, wealth and income were significantly and positively related in all general models and in the Malawi-specific model, but both lost significance in the Ghana regression model. The hypothesis H_{4b}, on certain characteristics of the household head, was confirmed with regards to the educational level of the head of household; it was positively related to willingness to pay and significant in all regression models. Insurance knowledge was positively related, but only significant in the general model (model 2) and lost significance in the country-specific models. Similarly, the *acknowledgment of health insurance as risk management strategy* was positively related, but only significant in model 2 and the Malawi-specific model. Hence, hypothesis H_{4b} was only confirmed regarding the educational level, while health insurance attitudes and knowledge showed a positive tendency, but were not significant in all models.

The variables on risk exposure gave mixed results in relation to WTP: While it was hypothesized (hypothesis H_{4c}) that exposure to general (non-health) risks lead to higher WTP, this could not be confirmed. Contrary to the hypothesis, general risk exposure was significant in all models, with a negative relationship to WTP. Apparently, general risk exposure did not sensitize for better protection from health risks. It could be either that protection from other risks was valued higher by the household or the household's risk management capacities were already bound with other types of risk. On the other hand, hypothesis H_{4d}, stating that high-risk households (health risks) were related with higher WTP, was confirmed, as it was significant in all regression models. With regard to high-cost households (recall period 3 months), it was hypothesized (H_{4e}) that a short-term experience of high costs did not lead to changes in the willingness to pay. This hypothesis was confirmed as the high-cost household variable was not a significant factor in any of the regression models.

The relationship between other applied SRM strategies and WTP levels was mixed. It was hypothesized that (hypothesis H_{4f}) there was a crowding out effect so that the application of other SRM strategies reduced the level of WTP. In fact, a variety of SRM strategies showed a negative relationship, such as *income diversification*, *use of savings* (significant in model 2, but not in the country-specific models), *use of credit/loans* (significant in model 2 and Ghana) and *likelihood of community assistance* (significant in

model 2 and Ghana). On the other hand, positively related to WTP levels were the SRM strategies *activity level in community associations*, *share of hh members contributing significantly to the income* and the *membership in microfinance* (significant in model 2 and Malawi). Hence, hypothesis H_{4f} could not be confirmed as such. Most SRM strategies showed a significant relationship, but not necessarily in the same direction. Hypothesis H_{4g}, stating that households who were insured for health in Ghana (NHIS member households) showed a higher level of WTP, could not be confirmed. The tendency of the variable was a negative relationship with WTP, but it was not significant.

7.5.2. Health insurance as SRM strategy in relation to risk exposure and other SRM strategies

While the willingness to pay level measured the potential demand for a hypothetical product, the variable *household insured for health* measured the actual positive decision to purchase health insurance coverage. This part of the analysis was also split into three regression models, one general model and two country-specific models; but the Malawi-specific model needed to be interpreted with caution, because micro health insurance or social health insurance was not available in Malawi and private health insurance products were barely accessible to low-income households. Therefore, only 26 households (3.14%) in the Malawian sample were insured for health, which made the regression model less reliable. It was decided not to include the WTP level in the model, because the WTP level on the day of the interview could not serve as an explanatory variable for having a health insurance contract. Table 51 shows the three regression models with health insurance membership of at least one household member as the dependent variable. Generally, the explanatory power of the models were quite low, as indicated by the adj. Pseudo R^2, between a meager 0.6%, in the case of Ghana, and 4.0%, in the Malawian case.[682] No substantial level of collinearity was detected, so no further adjustments had to be made.

Systemic differences between Ghana and Malawi were the reasons why the signs of the independent variables differed. For example, the high-risk status of a household was a significant predictor for household health insurance, with a positive relationship in the general and Ghana model, but with a negative relationship in the Malawi-specific model. In the general model, a one unit change of the household health risk status

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[682] Specification of general model: LR-χ^2(4)=57.70, p<0.001. Count R^2=0.703, Adj. Pseudo R^2=0.027 (0.328).

Specification of Ghana model: LR-χ^2(4)=14.42, p<0.01. Count R^2=0.683, Adj. Pseudo R^2=0.006 (0.019).

Specification of Malawi model: LR-χ^2(4)=19.28, p<0.001. Count R^2=0.969, Adj. Pseudo R^2=0.040 (0.0834).

increased the odds by 221.9% (a change of one sd by 30.1%) in the general model and by 223.5% (one sd by 35.7%) in the Ghana model. Contrary to the first two models, in the regression on Malawi, a one unit increase in the high-risk variable reduced the odds of holding health insurance by 97.4% (of one sd by 50.6%). This indicated that high-risk households in Malawi had less access to enter a private health insurance scheme than other low- or medium-risk households.

Tab. 51: Health insurance membership in relation to SRM sets and risk exposure (multivariate logistic regression)

	General		Ghana		Malawi	
Complexity of SRM sets (excl. health insurance)	0.141***	(0.0399)	0.0393	(0.0681)	0.475***	(0.1289)
General risk exposure of household (non-health, severe risks)	0.233***	(0.0706)	0.0836	(0.1007)	−0.129	(0.2716)
High-risk household (health)	1.169***	(0.2588)	1.174***	(0.3984)	−3.664**	(1.7600)
High cost household	−0.708***	(0.2662)	−0.857**	(0.3665)	0.0105	(0.7970)
Constant	−1.549***	(0.1331)	0.449**	(0.2047)	−4.414***	(0.5229)
Observations	1428		600		828	
Pseudo R^2	0.033		0.019		0.083	

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Dependent variable: Health insurance membership (at least one household member), dichotomous
Notes: [b]=binary/dichotomous variable, [c]=categorical variable, [l]= likert scale, [q]= quintiles, [z]= centered variable.

The number of applied SRM strategies (without health insurance) was positively related to health insurance membership. This relationship was highly significant in the general model (one additional unit increased the odds by 15.1% and one additional sd by 24.3%) and in the Malawian model (one additional unit increased the odds by 60.8% and one additional sd by118.1%).

Exposure to severe general, non-health related risks was a significant predictor only in the general model, but in none of the country-specific models; in the general model, a one unit increase in severe general risk exposure increased the odds of being insured for health by 26.2% (one sd change by 21.3%).

Assuming a financial protective effect from health insurance, the variable *high-cost household* was more likely an effect from not being covered by health insurance than the other way around. Hence, the interpretation of the negative relationship of high-cost households and health insurance membership, needed to be taken with caution. Being a high-cost household decreased the odds of holding a health insurance policy

by 50.8% in the general model and by 57.5% in the Ghana-specific model. The relationship was not significant in Malawi.

A significant relationship of variables related to SRM strategies and risk exposure with health insurance membership was hypothesized. Regarding severe general risk exposure (non-health) a positive relationship with health insurance membership was expected (hypothesis H_{5a}). This hypothesis was partially confirmed, because general risk exposure was significantly and positively related to health insurance membership in the general model. In Ghana, there was a positive tendency, without significance. Furthermore, high-risk (health) households were expected to have a positive relationship with health insurance membership (hypothesis H_{5b}), which was confirmed in the general model and in Ghana, where high-risk households were a highly significant factor for health insurance membership. In the Malawi-specific regression model, the factor was significant, but negatively related to health insurance membership. This was likely due to the private health insurance market in Malawi, which is accessible only for wealthier households and formal sector employees, who were also less likely to belong to the high-risk group. Since health insurance aims to protect members from high health care costs, it was hypothesized that high-cost households were less likely insured for health (hypothesis H_{5c}), which was confirmed in the case of the general model and in Ghana, where the factor showed a significant negative relationship.

Regarding the relationship of other SRM strategies with health insurance membership, there was a related discussion in the previous section on the determinants of willingness to pay. Similarly, in this analysis, regarding health insurance membership, it was hypothesized that a more complex set of SRM strategies was related to a lower likelihood that the household was member of a health insurance scheme (hypothesis H_{5d}). This hypothesis could not be confirmed. The complexity of SRM strategies was significant in the general and the Malawi-specific model, but showed, contrary to the hypothesis, a positive relationship with health insurance membership in all models. Hence, in this analysis, a crowding out effect of health insurance by other SRM strategies could not be confirmed, but rather a complementary relationship may have been present.

8. Conclusion

The scope of this study centered on the problem of the vulnerability of individuals and households to general risks and health risks, in low-income countries. The study analyzed household's and individual's social risk management strategies to counter these

risks. Also, higher level social risk management institutions (e.g. regional and national) were considered. Generally, among the most vulnerable groups are those individuals and households that are highly exposed to risks. The literature review indicated that high risk individuals and households carried the majority of the burden of risks, challenging their existing SRM strategies. In this regard, the main research question was posed *in what ways high risk exposure is related to the application of social risk management strategies by households and individuals in developing countries.*

The core underlying conceptual framework to address this research question was the Social Risk Management framework, originally developed by Holzmann and Jørgensen. As outlined in sections 3.1 and 3.2, the framework served as an excellent basis, but had to be adapted and conceptually improved in order to address the criticism that was raised by several researchers and in order to make the framework suitable for academic inquiry. The adapted framework (section 3.3) was improved in terms of selectivity and exclusivity of the different types of social risk management strategies. While the main types of proactive and reactive SRM strategies from the original framework could be kept, the sub-types were newly established, in order to capture all possible SRM strategies. The resulting sub-types ranged on a continuum from the proactive sub-types *reduction or elimination of the probability of a risk*, to *limiting the extent of the shock or its impact*, and the *mitigation of the impact of the shock* to the reactive sub-type *relieving the impact of the shock*.

This adapted framework allowed the author to comprehensively categorize the evidence of social risk management strategies in Sub-Saharan Africa. This included an analysis of the sequence in which different SRM strategies were applied, depending on the severity of the risk or shock.

The main findings of the literature review on the evidence of SRM strategies in Sub-Saharan Africa suggested a more dynamic view of social risk management than employed by other authors. Specifically, the concepts of *redundancy* and *subsidiarity* of SRM strategies on multiple levels, from the individual and household levels, to the community and regional levels, as well as to the national and global levels, had been included in the framework. The principle of subsidiarity postulates that there are advantages if SRM is pursued on the lowest possible level. However, redundant SRM strategies have to be established on higher levels, so that they can start to play a role if lower level strategies tend to fail, or if they are overburdened from an extraordinary scope of risks and/or the severity or duration of the shock.

A static view of SRM also reaches its limits when considering *iterative layers of SRM strategies*, which is commonly the case in Sub-Saharan African societies. Several SRM

strategies may already be used in situations without or with only minor shock exposure, but they are also used with an increasing intensity in the case of a higher severity or longer duration shock. Multiple, iterative layers of risk management strategies, for example, include mutual borrowing and gift-giving, occasionally asking for assistance and offering help. These frequent and iterative interactions create a situation of reciprocal bond and the expectation of help in times of need.

Furthermore, evidence suggested that it is difficult to consider *SRM strategies as generally being proactive or reactive.* In this regard, the details of applied SRM strategies are important and differentiate between strategies that are proactive and those that are reactive. For example, income diversification (portfolio diversification), which is commonly seen as a proactive strategy aimed at mitigating a shock, can also fall into the category of reactive strategies, if the household has to engage in different low-skilled and low-yield activities to make its living in order to relieve the impact of a shock. Similarly, borrowing can serve multiple SRM-related purposes, from proactive investments in portfolio diversification or education, to reactive borrowing, in order to ensure the survival of household members.

In order to answer the main research question, numerous analyses were conducted, using the data of the Pro MHI Africa cross-sectional internationally comparative household survey from Ghana and Malawi, representing 1428 households with 7088 individuals.

In order to evaluate SRM behavior of individuals and households depending on their risk exposure, it was essential, in a first step, to evaluate individual's and household's actual level of exposure to high general risks and high health risks. In order to better understand the extent of risk exposure, three kinds of risk exposure were operationalized from the household survey dataset: (1) Risk exposure to (severe) general risks of the household (in the last three years), (2) high health risk households (based on internationally acknowledged risk factors such as chronic or permanent illness conditions, previous utilization patterns (long hospitalization events) and belonging to a high age group) and (3) high-cost households (based on health care costs of illness episodes, recall period 3 months). Analysis of general risk exposure revealed that the vast majority of households (72.1%) in both countries had been exposed to an array of general risks that had negative economic impact on the household within the last three years (mean 2.4 risks).

However, section 7.2 showed that there was substantial variation in general risk exposure, which significantly depended on regional factors (country, region and sometimes community-level). The socio-economic status of households was also a signifi-

cant factor in general risk exposure, showing that the highest wealth quintile experienced the least general risk exposure (a relationship which was confirmed in the general and Ghana-specific model, but which was not significant in Malawi). The household total monthly income (quintiles) was not a significant factor. These findings confirmed the hypothesis that wealthier households had better means of reducing or eliminating general risk exposure.

Concerning health risks, the analysis in section 7.3 showed that a relatively small percentage of households (8.75%) could be considered *high-risk households* and, similarly a small share of individuals and households faced extraordinarily high health care costs, carrying the majority of health care costs in the entire sample. While in Malawi 5.6% of households caused 50% of total aggregated individual health care costs, in Ghana a relatively small percentage of just 0.9% of households caused 50% of total aggregated health care costs. Although, at first sight, this small percentage could indicate outliers, the health care utilization patterns of those individuals were not unrealistic. This high level of risk exposure made those households particularly vulnerable and substantially challenged their SRM capacities. Although health risks were generally randomly distributed, it was shown that certain personal characteristics, such as belonging to a higher age group (55+ years), sex (being female) or pre-existing health conditions (such as chronic or permanent diseases or long hospitalization stays), were significant predictors of a higher likelihood of future health shocks. Ultimately, these factors (independently or in combination) resulted in high health care costs. This means that if individuals carried one or more of the risk factors, they were more likely to show future high health care costs. The identified factors were in line with the literature review in section 2.3.2 and 2.4.2 and, therefore, were integrated into the definition of high-risk households (as mentioned above). Analyses also confirmed the hypothesis that health care costs were heavily right skewed and only a relatively small percentage of individuals and households were exposed to high health care costs that concentrated a large share of total aggregated health care costs on a few individuals and households in the sample.

The analysis of high-risk households showed that they were more than three times more likely to belong to the group of high-cost households than other households. This led to the main assumption that the experience of such high-risk households also triggered them to subsequently build up their sets of SRM strategies and change their general risk management behavior.

The analysis of the household application of (health) risk management strategies revealed that households applied a wide variety of SRM strategies. The core strategies

that could be operationalized in the household dataset, and which were applied by households, included (but were not limited to): *Health insurance*, the *use of formal and informal savings*, the *use of formal and informal credit/loans*, *income diversification*, *multiple income earners in the household*, a *decision-making role in community associations* as well as a *high activity level of the household in community associations and social networks*. The majority of households (56%) applied three or more of the seven SRM strategies tested (mean 2.76, median 3).

The complexity of SRM strategy sets, as well as the use of a particular SRM strategy type, depended on a variety of socio-economic characteristics and geographic factors. A significant (positive + or negative -) relationship was confirmed for the *country of the household* (with a higher complexity of SRM strategies in Ghana), *membership in local partner organization* (Malawi) (+), *age of head of household* (+ with peak at age group 55-64 years), *household size* (+ with a peak at 8-10), *female head of household* (-), *household religion* (+ for Muslim households) and *wealth quintiles* (+). The *education of the head of household* was not found to be significant. The significant factors were confirmed through multivariate analysis, except for household wealth quintiles, which lost significance in the multivariate view. In this analysis, the total household income quintiles were highly significant and positively associated with the complexity of SRM strategy sets. As mentioned above, the complexity of SRM strategy sets was higher in Ghana than in Malawi. The difference was largely a result of the high uptake of the NHIS in Ghana, while health insurance outreach was very low in Malawi. This finding indicated that health insurance did not crowd out other SRM strategies.

Multiple analyses in sections 7.4.3-7.4.6 provided evidence for the question, in what ways were exposure to high general and high health risks associated with household's application of particular sets of SRM strategies. Regarding general risk exposure, it was confirmed that experience with severe general risks was highly related to more complex sets of household's SRM strategies. Since the operationalized variable for general high risk exposure referred to shocks actually experienced within the last three years, the prospective classification of the high-risk status of households provided more insights into the planned SRM-related behavior of households. As hypothesized, it was confirmed that households classified as high-risk (health) households applied, on average, a significantly more complex set of SRM strategies. It was also confirmed that this behavioral change referred to an increased use of several SRM strategies, with a relatively clear focus on proactive SRM strategies, such as *health insurance*, *decision-making roles*, *high activity level in community associations and social networks*. However, the *use of credit/loans* also significantly increased among high-risk households, so that the

general finding of a tendency towards proactive strategies needed to be interpreted with caution. In Ghana, the uptake of health insurance in the NHIS by high-risk households was substantially above average. This confirmed the hypothesis that high-risk households were aware of their high health risk status, consequently building up sets of SRM strategies in anticipation of high future costs. It also confirmed some level of adverse selection in the health insurance scheme. This assumption was further established in the split view on high-risk households that experienced high costs and those not having experienced high costs. High-risk households did not significantly change their SRM-related behavior when they also faced high costs. Apparently, exposure to severe general risks and particularly the factor of being a high-risk household, allowed for a longer planning time for the household to diversify and build-up their sets of SRM strategies.

However, high-cost households (based on the health care costs in illness episodes with a recall period of 3 months) showed a substantial and significant increase in the complexity of SRM strategy sets, even if they were classified as low/medium risk households. This increase was not unexpected, as high-cost households were urged to activate and utilize their available SRM strategies, due to the experienced high costs. Hence, the causal relationship could not be conclusively evaluated. Those strategies that increased the most among high-cost households were the *use of credit* and the *use of savings*, but other SRM strategies were also increased. This indicated that high-cost households tended to apply ad-hoc SRM strategies, in order to deal with the high costs. Being a high-cost household in Ghana was negatively associated with the use of health insurance. Households that had at least one household member insured for health (in the NHIS) were significantly less likely to belong to the high-cost households than uninsured households. The results indicated that the NHIS provided some financial protection from high health care costs, as well as from low/medium health care costs, although a large share of insured households still showed high health care costs. It was also confirmed that membership in the NHIS in Ghana was not dependent on the wealth quintile of the household. On the other hand, the Malawian tax- and donor-financed health care system provided some protection from health care costs. Services at public (and most CHAM) health care facilities were supposed to be free at point of service, which was partially confirmed in analysis. 41% of households in Malawi who reported at least one illness episode also reported zero health care costs, compared to 18% of households in Ghana.

However, the hypothesis that high-cost households, who are also high-risk households, have a significantly different set of SRM strategies compared to other high-cost

households, could not be confirmed. The complexity of SRM strategy sets did not significantly differ between the two groups and the comparison in use of single SRM strategies showed some variation, although it was not significant. There were some indications that high-risk households built strategy sets containing more pro-active strategies, such as *health insurance*, *decision-making roles* and a *high activity level in community associations and social networks*. These SRM strategies were more frequently applied by high-risk households facing high costs. However, in comparison with low/medium risk households facing high costs, the results were mixed. Differences between these two groups were not significant and showed exceptions, such as the relatively higher use of the proactive *decision-making roles in community associations* by low/medium risk households facing high health care costs.

The household willingness to pay (WTP) for a hypothetical health insurance product served as a proxy for the demand for the SRM strategy *health insurance*. In order to evaluate the implications of high risk exposure in combination with household's set of SRM strategies on the demand of health insurance, several analyses (section 7.5.1) were conducted. Several socio-economic household characteristics were positively related to the WTP level, such as the *household wealth* and *total monthly income quintiles*, the *educational level of the household head* and (with some restrictions) *positive attitudes towards and knowledge of health insurance.*

Contrary to the hypothesized direction, household exposure to general (non-health) risks was negatively related to WTP. On the other hand, high-risk (health) households were consistently and significantly positively associated with WTP levels. For those households having experienced general risks, but without exposure to health risks, this seemed to be a logical step, not to highly value protection from health risks, as they (potentially) faced other kinds of risk.

The higher levels of WTP for a hypothetical insurance product by high-risk households confirmed the hypothesis that they were aware and sensitized by their risk status and built SRM strategies in anticipation of future shocks (in the form of high health care costs). Also, the hypothesis that high-cost households (3 months recall period) did not proactively build their SRM strategy sets (also with regard to health insurance/WTP) was generally confirmed. The variable of high-cost households was not a significant factor in the WTP analysis.

The relationship of other SRM strategies with WTP led to mixed results. While some SRM strategies showed a negative relationship (*income diversification*, *use of savings*, *use of credit*, *likelihood of community assistance*), other SRM strategies showed a positive relationship (*activity level in community associations*, *membership in microfinance*,

share of household members contributing significantly to the household income). Hence, it was not generally confirmed that the application of other SRM strategies created a crowding out effect on WTP (demand for health insurance). Contrary to the hypothesis, health insurance membership was not a significant factor in relation to WTP.

In addition to the analysis of the WTP measure as proxy for demand for health insurance, the actual decision to become a member of a health insurance scheme provided more information on the relationship of health insurance with risk exposure and the application of other SRM strategies. However, the analysis of health insurance membership had the disadvantage of being mainly restricted to Ghana (due to the very low outreach of health insurance in Malawi) and that the available variables explained only a small part of the variance in the membership variable.

The first indication of the interplay between health insurance and other SRM strategies was found in the general analysis of the household application of SRM strategies. This finding indicated that the existence of health insurance did not crowd out other SRM strategies (and vice versa), but that the strategies were rather complementary. Put more generally, it seemed that access to SRM strategies was rather positively associated with additional SRM strategies. For example, in the case of Ghana, the wide use of health insurance within the NHIS did not reduce the use of other SRM strategies, but rather complemented them.

The analysis with health insurance membership as the dependent variable (section 7.5.2) showed that health insurance membership was related to a variety of risk exposure and SRM-related variables. High-risk households, and household exposure to general risks, were significantly and positively related to health insurance membership. However, the relationship with general risk exposure was only significant in the general model covering both countries and the model on Malawi. As expected, high-cost households were significantly and negatively related to the uptake of health insurance membership. Hence, this sub-analysis also confirmed that some protection from high health care costs could be attributed to health insurance membership. The relationship with other SRM strategies (complexity of sets of SRM strategies (without health insurance)) also showed a complementary character, so that more complex SRM strategy sets were positively related to health insurance membership.

In conclusion, several sub-analyses confirmed that household exposure to high risk led to an increased complexity in the sets of SRM strategies. Those strategies that were increasingly used by high-risk (health) households pointed to a subsequent building-up of proactive SRM strategies, although this finding was not as clear as expected, in comparison to low/medium risk households facing high costs. The high uptake of

health insurance by high-risk households was a further indication of the orientation towards proactive strategies. This systematic build-up of SRM strategy sets by high-risk households was also confirmed by the finding that the appearance of high-costs among high-risk households did not lead to a significant difference in their application of SRM strategies. High health risk exposure not only led to a higher level of health insurance membership, but also a higher WTP. Although the exposure to general (non-health) risks was positively related to health insurance membership, it showed a negative relationship with WTP levels.

Given the concentration of the economic burden of general risks, and particularly of health risks on relatively few individuals and households, the findings plead for an increased targeting of programs supporting social risk management for the most vulnerable groups. The least wealthy households were certainly among the most vulnerable, as they had less access to SRM strategies, but this study also revealed that certain risk factors (for general risks or health risks) made a substantial difference in the burden of (future) risks that individuals and households had to carry. The findings indicated that such high-risk households were aware – to some extent – of their high risk status and, consequently, built more complex sets of (proactive) SRM strategies in anticipation of future shocks. The high probability of future shocks made those high-risk households vulnerable to falling into destitution and overburdening their existing SRM strategies. Targeting this relatively small share of high-risk households, in order to improve their proactive SRM capacities and to establish redundant SRM strategies on higher levels, can protect them from the high burden of health shocks. The findings also showed that (micro) health insurance provided some level of financial protection from high health care costs, without crowding out other SRM strategies. This confirmed that health insurance was a well-suited element in the SRM strategy set of low-income households. However, smaller insurance schemes generally have actuarial limits to include those high-risk households and, therefore, might require a subsidization for the inclusion of such high-risk groups, for example in the form of risk adjustment mechanisms.

The adapted social risk management framework provided a suitable basis for the analysis in this study. To improve future analyses using the framework, this study calls for a better understanding of the transition of the same type of SRM strategy from the proactive side to the reactive, erosive side of social risk management strategies. Further research is also required to identify suitable structures to support the application and accessibility of proactive SRM strategies for all individuals and households, specifically for high-risk households.

9. Appendices

Appendix 1: Distribution and outliers' detection of willingness to pay

Fig. 35: Distribution of original and transformed willingness to pay variable
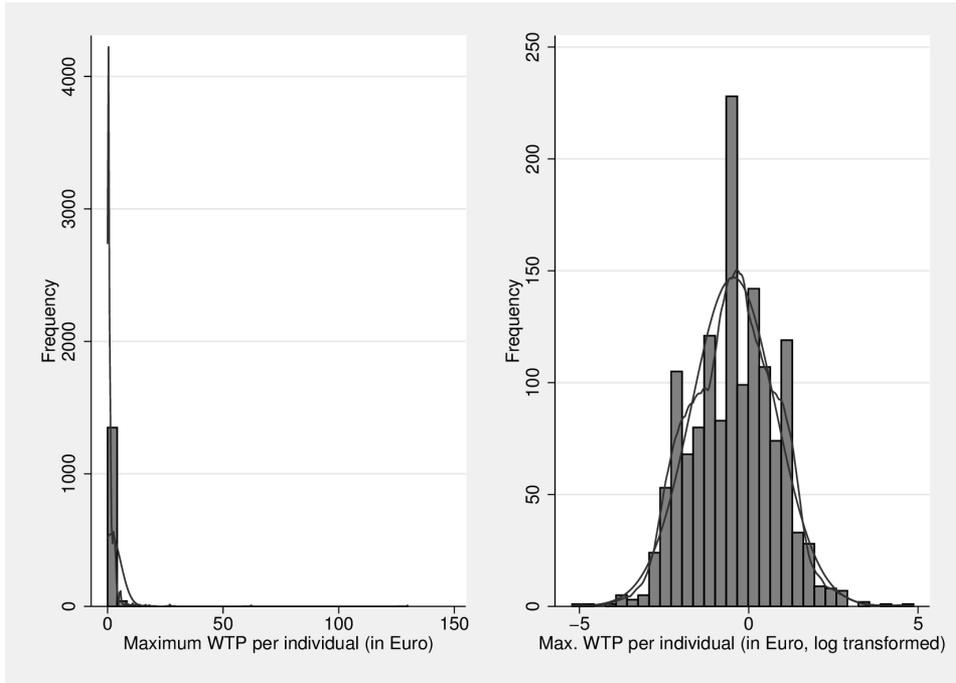
Source: Pro-MHI-Africa household data. N=1408 households.

Appendix 2: Association table of SRM strategies

Tab. 52: Pairwise correlation matrix of SRM strategies

	Health Insurance	Credit use	Savings use	Income diversification	Multiple income-earners	Decision-making role	High household activity level
Health Insurance	1						
Credit use	0.0421	1					
Savings use	0.1092[***]	0.1835[***]	1				
Income diversification	0.2533[***]	0.1043[***]	0.1459[***]	1			

Multiple income-earners	0.0914***	0.1061***	0.1571***	0.3736***	1			
Decision-making role	0.0468*	0.2403***	0.0812***	0.0675**	0.1369***	1		
High household activity level	0.0269	0.1171***	0.0860***	0.0320	0.0994***	0.3169***	1	

*Measure of association Φ. χ2-test of significance. * p < 0.05, ** p < 0.01, *** p < 0.001*
Source: Pro-MHI-Africa household data. N=1428 households.

Appendix 3: Complete table of sets of SRM strategies

#	Number of hh applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Hh activity level	Σ of SRM strategies
1	149	0	0	0	0	0	0	0	0
2	63	0	0	1	0	0	0	0	1
3	47	0	1	0	0	0	0	0	1
4	40	0	1	1	1	1	1	0	5
5	40	0	1	0	0	0	1	0	2
6	35	0	1	1	0	0	0	0	2
7	34	0	0	0	0	0	1	0	1
8	30	0	1	1	1	1	0	0	4
9	30	0	0	1	1	1	0	0	3
10	30	0	0	0	1	1	0	0	2
11	27	1	1	1	1	1	0	0	5
12	27	0	1	1	0	1	1	0	4
13	27	1	0	0	1	1	0	0	3
14	26	0	0	1	0	1	0	0	2
15	26	1	0	0	0	0	0	0	1
16	25	1	0	1	0	0	0	0	2
17	24	0	1	1	0	0	1	0	3
18	24	0	0	0	0	1	0	0	1
19	21	1	0	1	1	1	0	0	4
20	21	0	1	1	0	0	1	1	4
21	21	0	1	1	0	1	0	0	3
22	20	1	1	1	1	1	1	0	6
23	20	0	1	1	1	1	1	1	6
24	20	0	1	1	0	1	1	1	5
25	20	0	1	0	0	1	1	0	3
26	20	0	1	0	1	1	0	0	3
27	19	0	1	0	1	1	1	0	4
28	19	0	1	1	1	0	0	0	3
29	19	0	0	0	1	0	0	0	1
30	17	1	1	1	0	0	0	0	3
31	16	0	1	1	1	0	1	0	4
32	15	1	1	1	1	0	0	0	4
33	15	0	0	1	0	0	1	0	2
34	14	0	1	0	0	0	1	1	3
35	13	1	0	1	1	1	1	0	5
36	13	1	0	0	1	1	1	0	4
37	13	1	0	0	1	0	0	0	2
38	12	1	0	1	1	1	1	1	6
39	12	0	0	1	1	1	1	0	4
40	12	0	1	0	1	0	1	0	3
41	12	1	1	0	1	0	0	0	3
42	12	1	0	1	1	0	0	0	3

#	Number of hh applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Hh activity level	Σ of SRM strategies
43	12	0	0	1	0	1	1	0	3
44	12	0	0	1	1	0	0	0	2
45	10	1	1	0	1	1	1	0	5
46	10	1	1	0	1	1	0	0	4
47	9	1	1	1	1	0	1	0	5
48	9	1	0	1	1	0	1	0	4
49	9	0	0	0	0	1	1	1	3
50	9	0	1	0	0	1	0	0	2
51	9	0	0	0	0	1	1	0	2
52	8	1	1	1	1	1	1	1	7
53	8	0	1	0	0	1	1	1	4
54	8	1	1	1	0	1	0	0	4
55	8	0	0	0	1	1	1	0	3
56	8	0	0	0	0	0	1	1	2
57	8	1	0	0	0	1	0	0	2
58	8	1	0	0	0	0	1	0	2
59	7	1	0	1	0	1	0	0	3
60	6	1	1	1	1	1	0	1	6
61	6	1	1	1	0	0	1	0	4
62	6	1	0	1	0	0	1	0	3
63	6	1	1	0	0	0	0	0	2
64	6	0	1	0	1	0	0	0	2
65	5	1	1	1	0	1	1	0	5
66	5	0	1	0	1	1	1	1	5
67	5	1	1	1	0	0	1	1	5
68	5	1	0	1	1	0	1	1	5
69	5	0	0	1	0	1	1	1	4
70	5	1	0	1	0	1	1	0	4
71	5	0	0	0	1	1	1	1	4
72	5	1	1	1	0	0	0	1	4
73	5	1	0	0	1	0	1	0	3
74	4	1	0	0	1	1	1	1	5
75	4	0	1	1	1	0	1	1	5
76	4	0	0	1	1	0	1	1	4
77	4	0	0	1	1	0	1	0	3
78	4	0	0	0	1	0	1	1	3
79	4	1	0	0	0	1	1	0	3
80	4	0	0	0	1	0	1	0	2
81	4	0	0	0	0	0	0	1	1
82	3	0	1	1	1	1	0	1	5
83	3	1	0	1	1	1	0	1	5
84	3	0	0	1	1	1	1	1	5
85	3	1	1	0	1	0	1	0	4
86	3	0	1	0	1	0	1	1	4
87	3	1	1	0	0	0	0	1	3
88	3	1	1	0	0	1	0	0	3
89	3	1	1	0	0	0	1	0	3
90	3	1	0	0	0	0	0	1	2
91	2	1	1	1	1	0	1	1	6
92	2	1	0	1	0	1	1	1	5
93	2	1	1	0	1	1	0	1	5
94	2	1	1	0	0	1	1	1	5
95	2	0	0	1	1	1	0	1	4
96	2	1	0	1	0	1	0	1	4
97	2	1	1	0	0	1	1	0	4
98	2	0	1	0	1	1	0	1	4

#	Number of hh applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Hh activity level	Σ of SRM strategies
99	2	0	0	1	0	0	1	1	3
100	2	1	0	0	0	1	0	1	3
101	2	0	0	0	1	1	0	1	3
102	2	1	0	1	0	0	0	1	3
103	2	0	0	0	0	1	0	1	2
104	1	1	1	0	1	1	1	1	6
105	1	1	1	1	1	0	0	1	5
106	1	1	1	1	0	1	0	1	5
107	1	1	1	0	1	0	1	1	5
108	1	1	0	1	1	0	0	1	4
109	1	1	1	0	1	0	0	1	4
110	1	1	1	0	0	0	1	1	4
111	1	0	1	1	0	1	0	1	4
112	1	1	0	0	1	1	0	1	4
113	1	1	0	0	1	0	1	1	4
114	1	0	1	0	1	0	0	1	3
115	1	1	0	0	0	0	1	1	3
116	1	0	0	1	1	0	0	1	3
117	1	0	1	1	0	0	0	1	3
118	1	0	1	0	0	0	0	1	2
119	1	0	0	1	0	0	0	1	2
	1428	49.58%	50.42%	50.42%	51.26%	49.58%	51.26%	46.22%	3.49

Appendix 4: Sets of SRM strategies split by membership in local partner organization in Ghana

Fig. 36: Most frequently applied sets of SRM strategies of member households in the local partner organizations in Ghana (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
26								5
26								3
24								1
23								2
21								4
18								6
17								3
14								4
13								5
13								2
12								6
207 hh (= 50.99% of member hh)	100.0%	36.4%	72.7%	72.7%	54.5%	27.3%	9.1%	3.73

Source: Pro-MHI-Africa household data. N=406 member households (Ghana). 11 SRM sets, total of 57 SRM sets.
Note: Column percentages/mean are not weighted by the number of households applying a particular set of SRM strategies.

Contrary to the difference between households being member of the local partner organization and non-member households in Malawi, the difference between the member and non-member households in Ghana was smaller (figure 36 and 37). An excep-

tion was health insurance membership, as the local partner organizations were district-wide mutual health insurance schemes in the Ghanaian NHIS offering health insurance. There was no other scheme within the NHIS offering health insurance in these districts and private health insurance only played a minor role. Therefore, the difference of the mean number of SRM sets was slightly higher than subtracting health insurance: 3.73 compared to 2.14. A difference was identified in decision-making roles and high household activity level which did not play a role among non-member households, but were used by member households to 27.3% and 9.1%, respectively. In socio-economic variables, the households did not significantly differ: Member households were slightly more wealthy (mean 3.08, median 3) compared to non-members (mean 2.81, median 3). Also, the income level was almost the same (mean 2.98, median 3) compared to non-member households (mean 2.95, median 3). The households of member-households were slightly larger (5.41 compared to 4.59) which could be partially a result of the definition of that variable that a household counted as a member if any household member was part of the partner organization. The higher use of income diversification and multiple income earners could be partially also a result of slightly larger household size of member households.

Fig. 37: Most frequently applied sets of SRM strategies of non-member households in the local partner organizations in Ghana (over 50% of households)

Number of households applying this SRM set	Health insurance	Credit	Savings	Income diversification	Multiple income earners	Decision-making role	Household activity level	Σ of SRM strategies
19								4
19								3
15								2
15								0
13								3
12								2
12								1
105 hh (= 54.12% of non-member hh)	0.0%	28.6%	71.4%	57.1%	57.1%	0.0%	0.0%	2.14

Source: Pro-MHI-Africa household data. N=194 non-member households (Ghana). 7 SRM sets, total of 48 SRM sets.

Appendix 5: Pro MHI Africa - Household Survey Questionnaire[*]

	PROJECT: Pro-MHI-Africa			Ghana			
State/Region		**State Code**					
District		**Dist. Code**					
Village/community name		**Household number**					
Selection of household	**Membership list : 1 Random : 2**						
Date of interview (dd/mm/yyyy)			**2**	**0**	**0**	**9**	

Name of the respondent: _____

Address: _____

FIELD CONTROL INFORMATION				
Interviewer Code			Team Code	

Interviewer's name: _____ Sign. _____ Date _____ Time _____

Supervisor's name: _____ Sign. _____ Date _____ Time _____

Q No.	Questions and filters	Coding categories and codes	Skip to
0.1	Characteristics of the area where the house is located *[Please code by observation of housing situation.]*	Urban .... 1 Rural .... 2 Semi-Urban 3	
0.2	Type of house (social cat. proxy) *[Please code by observation of housing situation. If interview is not in the house, please ask]*	Made from mud, thatch, clay etc. .... 1 Partly low/ partly high quality materials .... 2 Brick, stone or cement house .... 3 Cannot say 999	
0.3	Main material of the floor *[Please code by observation of housing situation]*	Earth/sand .... 1 Wood planks .... 2 Palm/bamboo .... 3 Broken bricks .... 4 Cement .... 5 Other (specify) 6	
	[Read out] Good morning/evening. My name is _____ and I work on behalf of ISSER, University of Ghana..We do many kinds of surveys from time to time. At present we are doing one such survey in your area where we want to ask you some questions regarding health care utilization and spending in your household. Your replies will serve to improve health care financing policy in order to help less-wealthy persons in Ghana. We do not sell anything; we do not work for the government. The interview will take approximately 1 hour 30 minutes. The answers given will be kept absolutely confidential and anonymous. We do not retain your personal data and will not give personal information to anyone. I would really appreciate it if you could spare some of your time for this interview. Thank you very much!		
0.4	Are you willing to participate in this interview?	Yes .... 1 No 2	→ Go to 0.8
0.5	Start time (Record in 24 hrs format e.g. 4 pm is 16:00 hrs)	|___|___|:|___|___|	
0.6	End time (in 24hrs format)	|___|___|:|___|___|	
0.7	Break in minutes (if any)	|___|___|___| Minutes	
0.8	Result of Interview	Completed .... 1 Incomplete .... 2 Rescheduled .... 3 Refused .... 4 →	END

[*] The questionnaire is an adapted and largely rewritten version of the the questionnaire by the project "Strengthening Micro Health Insurance Units for the Poor in India" (ASIE/2004/095-995), funded by the EU-India Economic Cross Cultural Programme (ECCP).

SECTION 0: HOUSEHOLD ROSTER

We would like to make a complete list of household members. How many members belong to your household? Please name your household members.

[You keep a separate list of your household members (Annex 1). For confidentiality, please write down in the questionnaire only corresponding Person IDs]

Person ID	Sex 1=Male 2=Female	What is the residential status of this household member? 1= Usual member present 2= Usual member absent 3= Usual member who left household more than 6 months ago 4= Guest 5= Left permanently *[for the household members coded 4 and 5 end interview at QN 0.13]*	What is the relationship of this household member to the head of the household? 1= Head 2= Wife/husband 3= Son/daughter 4= Grand child 5= Mother/Father of head or spouse 6= Relative of head or spouse 7= Other relatives 8= Household/Servant 9= Tenant 10= Other (specify)	What is the age of this household member? *[If the age in years is not known, please ask for an estimate] [birthday in completed years]*	Was this household member ill during the last three months? *[If yes, ask:]* How often was this household member ill during the last three months? Please also include chronic disorders. *[please enter number of illness episodes]*	Which level of education has this household member obtained? 1 = No formal education 2 = Less than primary 3= Completed primary 4= Completed JSS 5= Completed SSS 6= Completed university/other tertiary 7= Don't know 8= Other (specify)	Please tell me the occupation of the members of your household. 1=Working on own farm 2= Own trade/business 3=Service provider 4=Daily wage earner/farm labourer 6=Regular wage earner 7=Student 8=Civil Servant 9=Other Public Service 10=NGOs 11=Cooperative 12=Unemployed 13=Child 14=Pensioner 15=Other (specify)	n/a	Is this household member insured with health insurance in the local NHIS scheme *[name of local partner organisation]?* Yes = 1 No = 2	Is this member of your household insured with any other health insurance? *[Please write in name of health insurance company/ institution]*
QN. 0.9	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										

SECTION 0: HOUSEHOLD ROSTER (continued)			
Q No.	Questions and filters	Coding categories and codes	Skip to
0.20	*[Please enter the Person ID of the re-spondent himself/herself]*	|___|___| Person ID of interviewed person	
0.21	What is the (predominant) religion of your household?	Christian ....…..…….....................1 Muslim ....…..…….....................2 Traditional religion ....3 Other (specify) ....4 No religion ....…..…….........................5	
0.22	What is the marital status of the head of household?	Single...1 Married (mono.) ....2 Married (poly.) ....3 Never married..4 Widowed...5 Seperated / divorced ....6 Cohabiting (informal/ loose unions).....7	
SECTION 1: AVAILABILITY OF HEALTH CARE PROVIDERS			
Q No.	Questions and filters	Coding categories and codes	Skip to
1.1: Primary Care			
1.1.1	How far away is the *closest* facility for pri-mary health care (allopathic)? *[convert to km if distance mentioned in other units]*	|___|___| km _____ (Other unit)	
1.1.2	Have you ever used a facility for primary health care?	Yes..............…..…….....................… 1 No .... 2 → **1.2.1**	
1.1.3	How far away is the facility for primary health care you normally use?	|___|___| km	
1.1.4	How much time does it take to get to the fa-cility you normally use?	|___|___| hours |___|___| minutes	
1.1.5	Is the primary health facility you normally use a private, public or charitable health care pro-vider?	Private... 1 Public .... 2 Charitable 3	
1.1.6	Why has your household decided to use this facility? You may give more than one an-swer. Do you use it because it is … *[Read out the options and code appropriate. cir-cle all that apply. Multiple answers possi-ble]*	<u>Yes</u> <u>No</u> Closest............................... 1......2 Cheapest .... 1......2 Best quality ....…............. 1......2 Best effort of staff.............................. 1......2 *[only if insured]* Obliged to do so by the health insurance scheme.... 1......2 Other (specify) .... 1......2	
1.1.7	How long is the average waiting time when seeing a general doctor/practitioner)? (be-ginning from the time you enter the facility)	|___|___| hours |___|___| minutes	
1.2: Hospitalisation in case of illness or accident			
1.2.1	How far away is the closest general hospital for illness or accident? *[convert to km if dis-tance mentioned in other units]*	|___|___|___| km _____ (Other unit)	
1.2.2	Have you ever used a general hospital?	Yes..............…..…….....................… 1 No .... 2 → **1.3.1**	
1.2.3	How far away is the general hospital you nor-mally use in case of illness or accident?	|___|___|___| km	
1.2.4	How much time does it take to get to the fa-cility you normally use?	|___|___| hours |___|___| minutes	
1.2.5	Is the hospital you normally use a private, public or charitable health care provider?	Private... 1 Public .... 2 Charitable 3	
1.2.6	Why has your household decided to use this facility? You may give more than one an-swer. Do you use it because it is … *[Read out the options and code appropriate. Cir-cle all that apply. Multiple answers possi-ble]*	<u>Yes</u> <u>No</u> Closest............................... 1......2 Cheapest .... 1......2 Best quality .... 1......2 Best effort of staff............................. 1......2 *[only if insured]* Obliged to do so by the health insurance scheme.... 1......2 Other (specify) .... 1......2	

1.2.7	How long is the average waiting time before seeing a doctor in hospital? (beginning from the time you enter the facility)	|___|___| hours |___|___| minutes	
1.3 : Pharmacy/drug dispensary			
1.3.1	How far away is the closest pharmacy/drug dispensary?	|___|___| km _____ (Other unit)	
1.3.2	Have you ever used a pharmacy / drug dispensary?	Yes.. 1 No 2 ➞ **Section 2**	
1.3.3	How far away is the pharmacy/drug dispensary you normally use?	|___|___| km	
1.3.4	How much time does it take to get to the facility you normally use?	|___|___| hours |___|___| minutes	
1.3.5	Is the pharmacy/ drug dispensary you normally use a private, public or charitable one?	Private.. 1 Public .... 2 Charitable 3	
1.3.6	Why has your household decided to use this facility? You may give more than 1 answer. Do you use it because it is … *[Read out the options and code appropriate. Circle all that apply. Multiple answers possible]*	**Yes No** Closest.. 1......2 Cheapest .... 1......2 Best quality .... 1......2 Best effort of staff.......................... 1......2 *[only if insured]* Obliged to do so by the health insurance scheme.... 1......2 Other (specify) .... 1......2	
1.3.7	How long is the average waiting time before you received prescribed medicines?	|___|___| days |___|___| hours	

SECTION 2: UTILIZATION AND SPENDING ON HEALTH

Illness in the household in the last 3 months.

[Explanation for the following sections: Here we will ask about illnesses of all household members that occurred during the last three months. Please ask for every household member and start with the person that suffered from the most serious illness(es) in that period. After collecting data for this person's illnesses, please go ahead with the next household member and so on; ask in descending order of importance of their illnesses.

An "illness episode" consists of one or more somehow interconnected illnesses of one particular household member. If, for example, diabetes and high blood pressure occurred in the same time or malaria and vomiting, they belong to one (and the same) illness episode. If, for example, a person has malaria and later or at the same time a fracture, this would be put into two different episodes as they are not related with each other. So, there may be more than one "illness episode" for one person, while for those persons, who have not been ill there is no "illness episode".]

[Read out] Now I would like to ask you about illnesses of yourself and members of your household in the last three months. Please try to recall all illness events in the last three months. Please also state recurrent complaints in your family. So, we are talking about persons who have been ill in the last 3 months or who needed treatment for their diagnosed chronic disorders to prevent complications (such as hypertension, heart disease, asthma, diabetes, arthritis, cancer, etc.). Ready? Let's go, step by step.

In the beginning of the interview, you mentioned illnesses of each household member. Now I will ask you for each person about these illnesses. We need some details about each illness separately. If you do not remember certain numbers, please use estimates. Please start with the household member that had the most serious illness(es).
[Use the table and fill in each episode after the other and separately. Go down one column first. Use further columns for more episodes of this household member. Then follow the same procedure with next household member that was ill.]
[You can enter up to five illness episodes per household on the next pages. If there are more illness episodes within the household, you can use the supplement to section 2.1 with an extra table for episodes 6-10 or even a second extra table for episodes 11-15) Please make sure that the household starts with the household member that had the most serious illness(es)]

[If there was no illness in the household in the last 3 months, please skip to 2.3]

X

EPISODE RECORD TABLE – INDIVIDUALS – SINGLE EPISODES	Episode 1 *[go down this column for first episode]* (a)	Episode 2 (b)	Episode 3 (c)	Episode 4 (d)	Episode 5 (e)
2.1.1 Which household member was affected in this illness episode *[please enter person ID]*	|__|__| person ID	|__|__| person ID	|__|__| person ID	|__|__| person ID	|__|__| person ID
2.1.2 In this episode, can you tell me, what was the reason for feeling ill or for seeking medical assistance? *[Code according to the classification given in Annex2a. It it is NOT possible to associate information by respondent to these classes, code 888]*	Class |__|__|	Class |__|__|	Class |__|__|	Class |__|__|	Class |__|__|
2.1.3 Who made the diagnosis to know what illness(es) the sick person had/has? *[Read out options]*	Medical doctor.................1 Yourself...........................2 Family/friends..................3 Traditional healer.............4 Other (specify).................5	Medical doctor.................1 Yourself...........................2 Family/friends..................3 Traditional healer.............4 Other (specify).................5	Medical doctor.................1 Yourself...........................2 Family/friends..................3 Traditional healer.............4 Other (specify).................5	Medical doctor.................1 Yourself...........................2 Family/friends..................3 Traditional healer.............4 Other (specify).................5	Medical doctor.................1 Yourself...........................2 Family/friends..................3 Traditional healer.............4 Other (specify).................5
2.1.4 What kind of illness(es) was it? Please mention up to four interconnected illnesses for this episode. *[Use illness/symptom codes according to (Annex 2b. If illnesses/symptoms are not mentioned in the list, please write in.] [For connected illnesses use the same episode. For other not connected illnesses open another episode later]*	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____
2.1.5 Is the same illness happening again and again to the same person or does it require permanent treatment like medication?	Yes..................1 No....................2	Yes..................1 No....................2	Yes..................1 No....................2	Yes..................1 No....................2	Yes..................1 No....................2
2.1.6 How many days was the sick person unable to perform normal functions or duties due to this/these illness(es)? *[Before writing "do not remember" probe further: "More than three days?", "Was it more or less than a week?", "More than a month?"]*	|__|__| days	|__|__| days	|__|__| days	|__|__| days	|__|__| days
2.1.7 How many days was the person hospitalized in this episode due to these illnesses *[as mentioned in 2.1.4]? [See question 2.1.6: probe further]*	|__|__| days *[if 0->2.1.9]*	|__|__| days *[if 0->2.1.9]*	|__|__| days *[if 0->2.1.9]*	|__|__| days *[if 0->2.1.9]*	|__|__| days *[if 0->2.1.9]*
2.1.8 *[only if 2.1.7 > 0]* How much money has your household spent for hospital treatment in this specific episode - treatment only without drugs, lab tests and so on?	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
2.1.9 How many times did this ill person consult allopathic/"western style" General Physician/primary caregiver for this episode?	|__|__| times *[if 0->2.1.11]*	|__|__| times *[if 0->2.1.11]*	|__|__| times *[if 0->2.1.11]*	|__|__| times *[if 0->2.1.11]*	|__|__| times *[if 0->2.1.11]*

EPISODE RECORD TABLE – INDIVIDUALS – SINGLE EPISODES	Episode 1 *[go down this column for first episode]* (a)	Episode 2 (b)	Episode 3 (c)	Episode 4 (d)	Episode 5 (e)
2.1.10 *[only if 2.1.9 > 0]* How much money has your household paid for all consultations of allopathic/"western style" **General** Physicians during this single episode – treatment only, without drugs, lab tests and so on?	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc
2.1.11 How many times did this ill person consult another allopathic/"western style" medical **specialist** for this episode?	⌊＿＿⌋ times *[If 0–>2.1.13]*	⌊＿＿⌋ times *[If 0–>2.1.13]*	⌊＿＿⌋ times *[If 0–>2.1.13]*	⌊＿＿⌋ times *[If 0–>2.1.13]*	⌊＿＿⌋ times *[If 0–>2.1.13]*
2.1.12 *[only if 2.1.11 > 0]* How much money did your household pay for his/her services in this episode - treatment only, without drugs, lab tests and so on?	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc
2.1.13 How many times did the ill person consult a traditional caregiver for this episode?	⌊＿＿⌋ times *[If 0–>2.1.15]*	⌊＿＿⌋ times *[If 0–>2.1.15]*	⌊＿＿⌋ times *[If 0–>2.1.15]*	⌊＿＿⌋ times *[If 0–>2.1.15]*	⌊＿＿⌋ times *[If 0–>2.1.15]*
2.1.14 *[only if 2.1.13 > 0]* How much money has your household paid for the consultation of traditional healers during this single episode together - without drugs?	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc	⌊＿＿＿＿⌋ GHc
2.1.15 How much of all the costs for treatment incurred for the above mentioned treatment(s) can your household claim back or have you already claimed back from a health insurance? *[hospital, general practitioner, specialist, traditional healer together]*	⌊＿＿＿＿＿⌋ GHc	⌊＿＿＿＿＿⌋ GHc	⌊＿＿＿＿＿⌋ GHc	⌊＿＿＿＿＿⌋ GHc	⌊＿＿＿＿＿⌋ GHc
[Check:] So, the amount of money your household has to bear for treatment in this episode is … *[calculate sum for treatment 2.1.8+2.1.10+ 2.1.12+2.1.14 – reimbursement 2.1.15]?*	*[If no, please correct above figures]*	*[If no, please correct above figures]*	*[If no, please correct above figures]*	*[If no, please correct above figures]*	*[If no, please correct above figures]*
2.1.16 How many times in this episode were allopathic /"western" drugs prescribed?	⌊＿＿⌋ times *[If 0–>2.1.20]*	⌊＿＿⌋ times *[If 0–>2.1.20]*	⌊＿＿⌋ times *[If 0–>2.1.20]*	⌊＿＿⌋ times *[If 0–>2.1.20]*	⌊＿＿⌋ times *[If 0–>2.1.20]*
2.1.17 How many times in this episode were the prescribed drugs not purchased?	⌊＿＿⌋ times *[If 0–>2.1.19]*	⌊＿＿⌋ times *[If 0–>2.1.19]*	⌊＿＿⌋ times *[If 0–>2.1.19]*	⌊＿＿⌋ times *[If 0–>2.1.19]*	⌊＿＿⌋ times *[If 0–>2.1.19]*
2.1.18 *[only if 2.1.17 > 0]* What were the reasons for not purchasing these drugs? *[Read out list to give options. Multiple answers possible]*	Y N Forgotten ....1 .....2 Not available in the pharmacy ....1 .....2 Used home made medicine instead ..1 .....2 Too expensive ....1 .....2 Do not trust these drugs ....1 .....2 Felt no need to do so ....1 .....2 Did not have money1 .....2 Other (specify) 1 2	Y N Forgotten ....1 .....2 Not available in the pharmacy ....1 .....2 Used home made medicine instead.. 1 .....2 Too expensive ....1 .....2 Do not trust these drugs ....1 .....2 Felt no need to do so ....1 .....2 Did not have money1 .....2 Other (specify) 1 2	Y N Forgotten ....1 .....2 Not available in the pharmacy ....1 .....2 Used home made medicine instead.. 1 .....2 Too expensive ....1 .....2 Do not trust these drugs ....1 .....2 Felt no need to do so ....1 .....2 Did not have money1 .....2 Other (specify) 1 2	Y N Forgotten ....1 .....2 Not available in the pharmacy ....1 .....2 Used home made medicine instead.. 1 .....2 Too expensive ....1 .....2 Do not trust these drugs ....1 .....2 Felt no need to do so ....1 .....2 Did not have money1 .....2 Other (specify) 1 2	Y N Forgotten ....1 .....2 Not available in the pharmacy ....1 .....2 Used home made medicine instead.. 1 .....2 Too expensive ....1 .....2 Do not trust these drugs ....1 .....2 Felt no need to do so ....1 .....2 Did not have money1 .....2 Other (specify) 1 2

EPISODE RECORD TABLE – INDIVIDUALS – SINGLE EPISODES	Episode 1 [go down this column for first episode] (a)	Episode 2 (b)	Episode 3 (c)	Episode 4 (d)	Episode 5 (e)
2.1.19 How much money did your household pay for purchase of allopathic/"western" medicine/drugs that was prescribed by a health professional in this episode?	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
2.1.20 How much money did your household pay for purchase of allopathic/"western" medicine/drugs that was NOT prescribed by any health professional in this episode?	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
2.1.21 How many times in this episode were traditional or similar drugs prescribed?	|__|__| times **[if 0->2.1.25]**	|__|__| times **[if 0->2.1.25]**	|__|__| times **[if 0->2.1.25]**	|__|__| times **[if 0->2.1.25]**	|__|__| times **[if 0->2.1.25]**
2.1.22 How many times in this episode did the ill person not purchase the traditional or similar drugs prescribed?	|__|__| times **[if 0->2.1.24]**	|__|__| times **[if 0->2.1.24]**	|__|__| times **[if 0->2.1.24]**	|__|__| times **[if 0->2.1.24]**	|__|__| times **[if 0->2.1.24]**
2.1.23 *[only if 2.1.22 > 0]* What were the reasons for not purchasing these drugs? *[multiple answers possible; read out list to give options]*	**Y N** Forgotten.............1.....2 Not available in the pharmacy ....1.....2 Used home made medicine instead..1.....2 Too expensive ....1.....2 Do not trust these drugs ....1.....2 Felt no need to do so ....1.....2 Did not have money1.....2 Other (specify) ....1.....2	**Y N** Forgotten.............1.....2 Not available in the pharmacy ....1.....2 Used home made medicine instead..1.....2 Too expensive ....1.....2 Do not trust these drugs ....1.....2 Felt no need to do so ....1.....2 Did not have money1.....2 Other (specify) ....1.....2	**Y N** Forgotten.............1.....2 Not available in the pharmacy ....1.....2 Used home made medicine instead..1.....2 Too expensive ....1.....2 Do not trust these drugs ....1.....2 Felt no need to do so ....1.....2 Did not have money1.....2 Other (specify) ....1.....2	**Y N** Forgotten.............1.....2 Not available in the pharmacy ....1.....2 Used home made medicine instead..1.....2 Too expensive ....1.....2 Do not trust these drugs ....1.....2 Felt no need to do so ....1.....2 Did not have money1.....2 Other (specify) ....1.....2	**Y N** Forgotten.............1.....2 Not available in the pharmacy ....1.....2 Used home made medicine instead..1.....2 Too expensive ....1.....2 Do not trust these drugs ....1.....2 Felt no need to do so ....1.....2 Did not have money1.....2 Other (specify) ....1.....2
2.1.24 How much money did your household pay for all non-allopathic/non-"western" medicine that was prescribed by a health professional in this episode?	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
2.1.25 How much money did your household pay for all non-allopathic/non-"western" medicine that was NOT prescribed by any health professional in this episode?	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
2.1.26 How much of the costs for drugs (allopathic and traditional) can your household claim or has your household already claimed back from a health insurance?	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
[Check:] So, the amount your household has to bear for drugs in this episode is…. *[calculate sum drugs 2.1.19+2.1.20=2.1.24+2.1.25 – reimbursement 2.1.26]?*	*[If no, please correct above figures]*	*[If no, please correct above figures]*	*[If no, please correct above figures]*	*[If no, please correct above figures]*	*[If no, please correct above figures]*
2.1.27 How many laboratory tests like blood or urine tests and the like did the sick person undergo in this episode?	|__|__| times **[if 0->2.1.29]**	|__|__| times **[if 0->2.1.29]**	|__|__| times **[if 0->2.1.29]**	|__|__| times **[if 0->2.1.29]**	|__|__| times **[if 0->2.1.29]**

EPISODE RECORD TABLE – INDIVIDUALS – SINGLE EPISODES	Episode 1 [go down this column for first episode] (a)	Episode 2 (b)	Episode 3 (c)	Episode 4 (d)	Episode 5 (e)
2.1.28 How much money did your household pay for all laboratory tests in this episode?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.29 How many imaging tests like xray, scan or ultrasound did the ill person undergo in this episode?	|___|___| times [If 0->2.1.31]	|___|___| times [If 0->2.1.31]	|___|___| times [If 0->2.1.31]	|___|___| times [If 0->2.1.31]	|___|___| times [If 0->2.1.31]
2.1.30 How much money did your household pay for all imaging tests in this episode?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.31 How much of the costs for laboratory or imaging tests can your household claim or have you already claimed back from a health insurance?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
[Check:] So, the amount your household has to bear for laboratory and imaging tests in this episode is…. [calculate sum lab&imaging 2.1.28+2.1.30 – reimbursement 2.1.31]?	[If no, please correct above figures]	[If no, please correct above figures]	[If no, please correct above figures]	[If no, please correct above figures]	[If no, please correct above figures]
2.1.32 How much money did your household spend in total on travel/transportation of the patient in this specific illness episode?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.33 How much money did your household spend in total on travel/transportation of the accompanying person in this specific episode including travel to purchase medicines?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.34 How much money did your household spend on visits to the hospitalised patient?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.35 How much money did your household spend in total on purchasing food for patient and accompanying person(s) during hospitalisation?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.36 How much money did your household spend in total on gifts to doctors/nurses/cleaners/others?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.37 How much income/wages did the ill person lose due to sickness in this episode?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.38 How much income/wages did the accompanying or caring person(s) lose due to treatment in this episode?	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc	|___|___|___| GHc
2.1.39 In order to finance all the treatments and health care expenditures in this episode, did your household use your household's savings?	Yes ....1 No ....2 [If no -> 2.1.41]	Yes ....1 No ....2 [If no -> 2.1.41]	Yes ....1 No ....2 [If no -> 2.1.41]	Yes ....1 No ....2 [If no -> 2.1.41]	Yes ....1 No ....2 [If no -> 2.1.41]
2.1.40 From where did your household take the savings? [Read out options. Multiple answers possible]	Y N Cash stored at home 1 ....2 Bank account............ 1 ....2 Savings club .... 1 ....2 Account at [local partner organisation]1 ....2 Other (specify) 1 2	Y N Cash stored at home 1 ....2 Bank account............ 1 ....2 Savings club .... 1 ....2 Account at [local partner organisation]1 ....2 Other (specify) 1 2	Y N Cash stored at home 1 ....2 Bank account............ 1 ....2 Savings club .... 1 ....2 Account at [local partner organisation]1 ....2 Other (specify) 1 2	Y N Cash stored at home. 1 ....2 Bank account............ 1 ....2 Savings club .... 1 ....2 Account at [local partner organisation] 1 ....2 Other (specify) 1 2	Y N Cash stored at home. 1 ....2 Bank account............. 1 ....2 Savings club .... 1 ....2 Account at [local partner organisation] 1 ....2 Other (specify) 1 2

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EPISODE RECORD TABLE – INDIVIDUALS – SINGLE EPISODES	Episode 1 *[go down this column for first episode]* (a)	Episode 2 (b)	Episode 3 (c)	Episode 4 (d)	Episode 5 (e)
2.1.41 Did your household borrow money to finance all the treatments and health care expenditures in this episode?	Yes ...1 No ...2 *[If no -> 2.1.43]*	Yes ...1 No ...2 *[If no -> 2.1.43]*	Yes ...1 No ...2 *[If no -> 2.1.43]*	Yes ...1 No ...2 *[If no -> 2.1.43]*	Yes ...1 No ...2 *[If no -> 2.1.43]*
2.1.42 From where/whom did your household borrow the money or take credit? *[Read out options. Multiple answers possible]*	**Y N** Borrowed from relative/friend ...1...2 Borrowed from bank ...1...2 Borrowed from *[local partner organizat.]* ...1...2 Credit from moneylender ...1...2 Credit club ...1...2 Other (specify) ...1...2	**Y N** Borrowed from relative/friend ...1...2 Borrowed from bank ...1...2 Borrowed from *[local partner organizat.]* ...1...2 Credit from moneylender ...1...2 Credit club ...1...2 Other (specify) ...1...2	**Y N** Borrowed from relative/friend ...1...2 Borrowed from bank ...1...2 Borrowed from *[local partner organizat.]* ...1...2 Credit from moneylender ...1...2 Credit club ...1...2 Other (specify) ...1...2	**Y N** Borrowed from relative/friend ...1...2 Borrowed from bank ...1...2 Borrowed from *[local partner organizat.]* ...1...2 Credit from moneylender ...1...2 Credit club ...1...2 Other (specify) ...1...2	**Y N** Borrowed from relative/friend ...1...2 Borrowed from bank ...1...2 Borrowed from *[local partner organizat.]* ...1...2 Credit from moneylender ...1...2 Credit club ...1...2 Other (specify) ...1...2
2.1.43 Did your household need to sell assets to finance the health care costs for this episode?	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2
2.1.44 Did your health insurance pay anything for the health care costs in this episode?	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2
2.1.45 Is reimbursement from the health insurance still pending for health care costs in this episode? If yes, how much? *[if no, fill 0]*	|__|__|__| GHc	|__|__|__| GHc	|__|__|__| GHc	|__|__|__| GHc	|__|__|__| GHc
2.1.46 Did your household pay the health care costs in this episode in kind and not only in cash?	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2	Yes ...1 No ...2
2.1.47 Did your household use other sources (not yet mentioned) to finance the health care costs in this episode? *[If yes, please specify]*	_____	_____	_____	_____	_____
2.1.48 Which sources were the most important for financing health care expenditures in this episode? *[Please enter up to three most important sources and use the codes of following options:]* 01 = Savings 02 = Savings/credit club 03 = Borrowed from relative/ friend 04 = Borrowed from moneylender 05 = n/a 06 = Borrowed from bank 07 = In kind payment 08 = Sold assets 09 = Insurance 10 = Other (specify)	Sources by importance: |__| 1st important |__| 2nd important |__| 3rd important If "10=other" used, please specify here:	Sources by importance: |__| 1st important |__| 2nd important |__| 3rd important If "10=other" used, please specify here:	Sources by importance: |__| 1st important |__| 2nd important |__| 3rd important If "10=other" used, please specify here:	Sources by importance: |__| 1st important |__| 2nd important |__| 3rd important If "10=other" used, please specify here:	Sources by importance: |__| 1st important |__| 2nd important |__| 3rd important If "10=other" used, please specify here:

[You can record up to 5 episodes here. Use supplement to section 2.1. for more episodes (episodes 6-10 or even episodes 11-15, and more]]
if Extra Table used code One extra table used = 1, Two extra tables used=2 \|__\|

2.3 HOSPITALISATION IN HOUSEHOLD IN THE LAST 24 MONTHS

[Read out] Thank you very much for the information on utilization of care and spending. We would like to focus now on hospitalisations of each household member during a longer period of time, let's say the last 24 months. We refer here only to hospitalisation due to illness, but NOT to maternity. *[The household can give hospitalisations for at maximum five household members (column (a)-(e)). Please make sure to start with the household member that had the most serious hospitalisations]*

	Hospitalisations for first person *[go down this column for first person]* (a)	Hospitalisations for second person (b)	Hospitalisations for third person (c)	Hospitalisations for fourth person (d)	Hospitalisations for fifth person (e)
2.3.1 Which member of your household has been hospitalised? *[Please enter Person ID]* *[please make sure that you start in column (a) with the household member, who had the most serious hospitalisations]*	|__| Person ID	|__| Person ID	|__| Person ID	|__| Person ID	|__| Person ID
2.3.2 How many times was there hospitalisation in the last 24 months for this household member?	|__| times	|__| times	|__| times	|__| times	|__| times
2.3.3 How many of these hospitalisations were due to emergency? (accident/illness)	|__| hospitalisation(s)	|__| hospitalisation(s)	|__| hospitalisation(s)	|__| hospitalisation(s)	|__| hospitalisation(s)
2.3.4 How many days did each hospitalisation for this household member last on average? *[Before writing "do not remember" probe further: "More than three days?", "Was it more or less than a week?", "More than a month?"]*	|__| days on average	|__| days on average	|__| days on average	|__| days on average	|__| days on average
2.3.5 How many times was surgery also necessary in these hospitalisations?	|__| times *[if 0 -> 2.3.8]*	|__| times *[if 0 -> 2.3.8]*	|__| times *[if 0 -> 2.3.8]*	|__| times *[if 0 -> 2.3.8]*	|__| times *[if 0 -> 2.3.8]*
2.3.6 How many times was this surgery "minor"? *[minor surgery is for e.g. closing wounds, draining pus, removing toe-nails, tonsillectomy, setting of bones etc.]*	|__| times	|__| times	|__| times	|__| times	|__| times
2.3.7 How many times was this surgery "major"? *[major surgery often makes it necessary to stay many days in hospital, such as surgery due to fracture, eye surgery, heart surgery, etc.]*	|__| times	|__| times	|__| times	|__| times	|__| times
2.3.8 How much money did your household pay (out of pocket) for all hospitalisations for this person?	|__|__|__|__|__| GHc	|__|__|__|__|__| GHc	|__|__|__|__|__| GHc	|__|__|__|__|__| GHc	|__|__|__|__|__| GHc

	Sources by importance:	Sources by importance:	Sources by importance:	Sources by importance:	Sources by importance:
2.3.9 Which sources were the most important for financing hospitalisation? *Please enter up to three most important sources. Use the codes of following options:]* 01 = Savings 02 = Savings/credit club 03 = Borrowed from relative/ friend 04 = Borrowed from money lender 05 = n/a 06 = Borrowed from bank 07 = In kind payment 08 = Sold assets 09 = Insurance 10 = Other (specify)	|__|__| 1st important |__|__| 2nd important |__|__| 3rd important If "other" used, please specify here: _____	|__|__| 1st important |__|__| 2nd important |__|__| 3rd important If "other" used, please specify here: _____	|__|__| 1st important |__|__| 2nd important |__|__| 3rd important If "other" used, please specify here: _____	|__|__| 1st important |__|__| 2nd important |__|__| 3rd important If "other" used, please specify here: _____	|__|__| 1st important |__|__| 2nd important |__|__| 3rd important If "other" used, please specify here: _____
2.3.10 How much money was reimbursed by a health insurance for the hospitalisation(s)?	|__|__|__|__|__| GHc *[Check:]* So, the amount your household had to bear for these hospitalisations was … *[2.3.8-2.3.10]*? *[If no, please correct above figures]*	|__|__|__|__|__| GHc *[Check:]* So, the amount your household had to bear for these hospitalisations was … *[2.3.8-2.3.10]*? *[If no, please correct above figures]*	|__|__|__|__|__| GHc *[Check:]* So, the amount your household had to bear for these hospitalisations was … *[2.3.8-2.3.10]*? *[If no, please correct above figures]*	|__|__|__|__|__| GHc *[Check:]* So, the amount your household had to bear for these hospitalisations was … *[2.3.8-2.3.10]*? *[If no, please correct above figures]*	|__|__|__|__|__| GHc *[Check:]* So, the amount your household had to bear for these hospitalisations was … *[2.3.8-2.3.10]*? *[If no, please correct above figures]*

2.4 Utilization regarding maternity since the year 2004, i.e. in last 5 years in your household			
2.4.1	How many pregnancies (both completed and not completed) were there in your household in the last five years i.e since the year 2004?	|___|___| pregnancies in the last five years	*[if 0 -> 2.5]*
2.4.2	How many deliveries in total were there in this period?	|___|___| deliveries in the last five years	
2.4.3	How many live-births occurred in this period in total?	|___|___| live births	
2.4.4	Were there prenatal visits to clinics/hospital/ General Physician/OB/Gynae?	Yes.. 1 No 2	**Continue → 2.4.14**
2.4.5	How far is the facility you used for prenatal care?	|___|___|___| km Midwife/nurse comes home....................666	
2.4.6	How much time does it take to get to the facility?	|___|___| hours |___|___| minutes	
2.4.7	Is this facility a private, public or charitable health care provider?	Private.. 1 Public .... 2 Charitable 3	
2.4.8	When prenatal visits, how many visits were there on average per pregnancy?	|___|___| visits on average	
2.4.9	How much money did your household spend for prenatal care?	|___|___|___|___| GHc	
2.4.10	From which sources did the financing of prenatal care come? *[Please enter up to three most important sources. Use the codes of following options:]* 01 = Savings 02 = Savings/credit club 03 = Borrowed from relative/ friend 04 = Borrowed from moneylender 05 = n/a 06 = Borrowed from bank 07 = In kind payment 08 = Sold assets 09 = Insurance 10 = Other (specify)	Sources by importance: |___|___| 1st important |___|___| 2nd important |___|___| 3rd important If "other" used, please specify here: _____	
2.4.11	*[only if insured household]* Were these costs reimbursed by your insurance? *[If yes:]* How much?	|___|___|___|___| GHc	
[Check:] So, *[2.4.9-2.4.11]* was the amount your household had to bear for prenatal care. *[if no, please correct above figures]*			
2.4.12	Why has your household decided to use this facility for prenatal visits? You may give more than one answer. Do you use it, because it is … *[Read out the options and code appropriate. Multiple answers possible]*	**Yes No** Closest...1......2 Cheapest ....1......2 Best quality ....1......2 Best effort of staff ....1......2 *[only if insured]* Obliged to do so by the health insurance scheme.....1......2 Other (specify) ....1......2	
2.4.13	When the facility was used by your household, how did you experience the quality of treatment received?	Very Good .... 1 Good... 2 Satisfactory.................................... 3 Bad .... 4 Very bad 5	
2.4.14	How many deliveries were there at home/at mother's place?	|___|___| deliveries at home/mothers place	*[if 0 -> 2.4.17]*
2.4.15	How many births occurred from members of your household at home/at mother's place?	|___|___| live births at home/mother's place	

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2.4.16	Why has your household decided to deliver the child at home/mothers place? You may give more than one answer. Do you use it because it is … *[Read out the options and code appropriate. Multiple answers possible]*	**Yes** **No**
		Habit/tradition .... 1........ 2
		Cheapest/no money for other
		  facility.. 1........ 2
		Best (e.g. help through excellent
		  Midwife/nurse or relatives; providers
		  are worse in quality) .... 1........ 2
		Other (specify) .... 1........ 2	

2.4.17	How many deliveries occurred in the hospital?	|___|___| deliveries at hospital	*[if 0 -> 2.4.26]*
2.4.18	How many live births occurred at the hospital?	|___|___| live births at hospital	
2.4.19	How much money did your household spend on delivery at hospital?	|___|___|___|___|___| GHc	
2.4.20	Were these expenditures reimbursed by your insurance? *[if yes:]* How much?	|___|___|___|___|___| GHc	
[Check:] So, the amount your household had to bear for births was … *[2.4.19-2.4.20]*? *[if no, please correct above figures]*			
2.4.21	How far away is the hospital for delivery from home?	|___|___|___| km	
2.4.22	How much time does it take to get to the hospital for delivery from home?	|___|___| hours |___|___| minutes	
2.4.23	Is this hospital for delivery a private, public or charitable health care provider?	Private... 1 Public .... 2 Charitable 3	
2.4.24	Why has your household decided to use this hospital for delivery? You may give more than one answer. Do you use it because it is … *[Read out options. Multiple answers possible]*	**Yes** **No** Closest..1 .... 2 Cheapest ....1 .... 2 Best quality ....1 .... 2 Best effort of staff ....1 .... 2 *[only if insured]* Obliged to do so by the health insurance scheme...1 .... 2 Other (specify) 1 2	
2.4.25	When the hospital was used by your household for delivery, how much was the average waiting time before seeing a doctor/midwife? (beginning from the time you enter the facility)	|___|___| hours |___|___| minutes	
2.4.26	How many deliveries occurred at a health care centre (not a hospital)?	|___|___| deliveries	*[if 0 -> 2.4.35]*
2.4.27	How many live births occurred at a health care centre (not a hospital)?	|___|___| live births at health care center (not a hospital)	
2.4.28	How much money did your household spend on a health care centre (not a hospital)?	|___|___|___|___|___| GHc	
2.4.29	Were these expenditures reimbursed by your insurance? *[if yes:]* how much?	|___|___|___|___|___| GHc	
[Check:] So, the amount your household had to bear for births at a health care centre (not a hospital) was … *[2.4.28-2.4.29]*? *[if no, please correct above figures]*			
2.4.30	How far away is this health care centre from home?	|___|___|___| km	
2.4.31	How much time does it take to get to this health care centre?	|___|___| hours |___|___| minutes	
2.4.32	Is this health care centre a private, public or charitable health care provider?	Private... 1 Public .... 2 Charitable 3	
2.4.33	Why has your household decided to use this health care centre? You may give more than one answer. Do you use it because it is … *[Read out the options and code appropriate. Multiple answers possible]*	**Yes** **No** Closest..1 .... 2 Cheapest ....1 .... 2 Best quality ....1 .... 2 Best effort of staff ....1 .... 2 *[only if insured]* Obliged to do so by the health insurance scheme...1 .... 2 Other (specify) 1 2	

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2.4.34	When the health care centre was used by your household, how long was the average waiting time before seeing a dotor/midwife? (beginning from the time you enter the facility)	|__|__| hours |__|__| minutes	
2.4.35	How many visits to the health care centre/hospital/midwife did the mothers make on average within forty days after each delivery?	|__|__| visits on average	
2.4.36	How much money did your household spend on health care that mothers receive after delivery (postnatal care during fourty days after delivery) in the last five years?	|__|__|__|__| GHc	

2.5 Chronic Illnesses in the last 12 months

[Read out] I am now asking you again about illnesses which happen again and again to the same person or which require permanent treatment or medication. But when we now talk about these chronic illnesses like tuberculosis, asthma, diabetes, cancer, heart failure or the like we focus on the last 12 months. This will give me a good overview.

Q No.	Questions and filters	Coding categories and codes	Skip to
2.5.1	Do some people in your household have the same illness again and again or even permanently? These can be illnesses like diabetes, high blood pressure or the like.	Yes..1 No...2	
2.5.2	How many members of your household have such permanent problems?	|__|__| members	**[if 0 -> section3]**
2.5.3	Who in your household had such permanent problems? **[please enter Person IDs]**	|__|__|,|__|__|,|__|__|,|__|__|,|__|__| PersonIDs	
2.5.4	Please estimate how much your household has spent on drugs in the last 12 months for these permanent illnesses (of all) only.	|__|__|__|__|__| GHc	
2.5.5	Please estimate how much your household has spent on medical treatment in the last 12 months for these permanent illnesses (of all) only.	|__|__|__|__|__| GHc	

SECTION 3: MEMBERSHIP AND SPENDING ON HEALTH INSURANCE

Q No.	Questions and filters	Coding categories and codes	Skip to
3.1	How many members of your household are insured for health with … **[name of local partner organisation]**? **[if unsure, please compare to household roster in section 0]**	|__|__| members	**[if 0 -> 3.22]**
3.2	Since when are you personally a member of the health insurance ... **[name of local partner organisation]**?	|__|__| years |__|__| months **[Code 0, if not insured personally]**	
3.3	Why have you / the insured household members decided to join the scheme? **[read out options. Multiple answers possible]**	**Yes** **No** Good quality of care offered...... 1 .... 2 Financial protection from out of pocket payments.................... 1 .... 2 Compulsory .... 1 .... 2 Somebody told me to do so ...... 1 .... 2 Cheapest way to care .... 1 .... 2 Became aware through radio, TV, newspaper...................... 1 .... 2 Other (specify) 1 2	

3.4	Do you or any other member of your household participate in administration of this health insurance in any way? **[read out options]**	Yes, personally..1 ⟶ Yes, other members of household.........2 No...3	**[-> 3.6]**
3.5	Please estimate the average hours per week that you or members of your household participate in the administration? **[please take household member who participates most]**	|___|___| hours/week	
3.6	How much premium did your household pay for health insurance in the last 12 months to ... **[name of local partner organisation]** in total?	|___|___|,|___|___| GHc,Gp	
3.7	How often do you normally have to pay premium in this scheme? **[read out options]**	Every week...1 Every month..2 Every quarter......................................3 Every 6 months....................................4 Every 12 months..................................5	
3.8	In relation to your income, what do you think about the amount of the premium? **[read out options]**	Very expensive .... 1 Expensive... 2 Just ok... 3 Inexpensive.. 4 Cheap.. 5	
3.9	Is the process of premium payment convenient?	Yes ....1 No...2	
3.10	Is the process of premium payment safe?	Yes ....1 No...2	
3.11	Are you satisfied with what the insurance covers (i.e. benefit package)? **[read out options]**	Very satisfied..... .... 1 Satisfied .... 2 Neither satisfied nor unsatisfied.......... 3 Not satisfied .... 4 Not satisfied at all................................. 5	
3.12	Have you ever made a claim?	Yes ....1 No...2 ⟶	**[3.18]**
3.13	Was coverage ever denied?	Yes ....1 No...2	
3.14	How satisfied are you with the claim settlement mechanism applied by ... **[name of local partner organisation]** **[read out options]**	Very satisfied..... .... 1 Satisfied .... 2 Neither satisfied nor unsatisfied.......... 3 Not satisfied .... 4 Not satisfied at all................................. 5	
3.15	What should be improved? **[read out options. Multiple answers possible]**	**Yes No** Faster reimbursement..................................1 ....2 Mechanism to bridge gap between out-of-pocket payment and reimbursement needed................................1 ....2 Less paperwork...1 ....2 Less driving to office of **[name of local partner organisation]**..1 ....2 More time to submit claim ....1 ....2 Other (specify) 1 2	
3.16	How much money did you spend on travel costs/other costs for getting the claims reimbursed in the last 12 months?	|___|___|___|___| GHc	
3.17	Were you satisfied with the amount reimbursed by your insurer when you made your claim? **[read out options]**	Very satisfied....................................... 1 Satisfied .... 2 Neither satisfied nor unsatisfied.......... 3 Not satisfied .... 4 Not satisfied at all................................. 5	
3.18	Have the terms and conditions of the insurance product been clearly communicated to you?	Yes...1 No...2	
3.19	Are written materials on the insurance easy to understand and complete?	Yes...1 No...2	

XX

3.20	Do you believe that you have a good understanding of the insurance product (that is, what it is all about, including what you pay and benefits you receive)?	Yes..1 No...2	
3.21	Does your household have plans to quit the insurance in future?	Yes..1 No...2	**[go to 3.24]**
3.22	**[only if not insured with local partner organisation]** Have you or other members of your household ever been insured with ...**[name of local partner organisation]**?	Yes, personally...1 Yes, other members of household.............2 No...3	
3.23	**[only if not insured with local partner organisation]** Why are you or other members of the household currently not (or not anymore) insured in the scheme? You can give more than one reason. **[Read out options. Multiple answers possible]**	**Yes** **No** Have not heard about it...........................1 ....2 Too expensive..1 ....2 Benefits are not good...............................1 ....2 I do not trust it ....1 ....2 Why pay before I am sick? ....1 ....2 Too complicated.......................................1 ....2 Insufficient claim settlement....................1 ....2 Health care provided of bad quality ....1 ....2 Access to scheme restricted (e.g. for Self help group members,…) ...1 ....2 Other (specify) 1 2	
3.24	How many members of your household are currently insured for health with any OTHER scheme? **[if unsure, please compare to household roster in section 0]**	|___|___| members	**[if 0 -> 3.27]**
3.25	How much premium did your household pay for any other health insurance in the last 12 months?	|___|___|,|___|___| GHc,Gp	
3.26	Who provides this health insurance?	Employer...1 Professional association ....2 Cooperative...3 Bank ....4 Self help group/NGO **[other than local partner organisation]**.................................5 Individual contract with insurance company..6 Other (specify)...8	

SUBSECTION 3B, GHANA: NHIS AND MICRO HEALTH INSURANCE			
Q No.	**Questions and filters**	**Coding categories and codes**	**Skip to**
3.27	Did you/someone in your household belong to the defunct micro health insurance/health insurance in this community/area? **[before the NHIS started]**	Yes ....…...…. 1 No........…..…........ 2	**3.30**
3.28	How many years were you a member of the defunct micro health insurance?	|___|___| years	
3.29	When was the last year you were a member of the micro health insurance?	200___	
3.30	If you compare the NHIS to the former micro health insurance: Are you more satisfied now, with NHIS?	Much more satisfied................................ 1 More satisfied.. 2 The same .... 3 Less satisfied .... 4 Much less satisfied.................................. 5 Cannot say 6	
3.31	Are/Were you or someone in your household a member of the NHIS?	Yes ....…...…. 1 No, never...…... 2	**section 4**

3.32	How long have you been a member of the NHIS?	|__| years	
3.33	When was the first year you were a member of the NHIS?	200___	
3.34	How long did/do you need to wait for your membership card after enrolling in NHIS?	|__|__| months |__| weeks	
3.35	Do you pay your premium yourself, or someone else (like government or NGO or extended family member) does?	Pay myself...1 Government/free for me/I am exempted...2 Extended family member ....3 Other (specify) 4	
3.36	To which group in the NHIS do the members of your household belong? **[Read out answers. multiple answers possible.]**	**Yes** **No** Usual member (paying premium)............1 ....2 Children below 18 (exempt) ....1 ....2 Indigents (exempt) ....1 ....2 Persons above 70 years (exempt) ....1 ....2 Formal sector workers (SSNIT) 1 2	

SECTION 4: HOUSEHOLD EXPENDITURE THAT IS NOT HEALTH CARE RELATED.

[Read out] Now I need to see what proportion of your expenditure is related to health compared to non-health related spending. I will ask about the last month and the last 12 months. Please try to give your best estimate.

How much did your household spend on the following items? **[please ask last month and last 12 months for every item before you go to next item]**

Item	Last month (a)	Last 12 months (b)
4.1 Food	|__|__|__|__| GHc	|__|__|__|__| GHc
4.2 Clothing and footwear	|__|__|__|__| GHc	|__|__|__|__| GHc
4.3 Housing (rent, repair, buying, construction, fuel, electricity, water, kerosene for lamps, electric bulbs, rubbish disposal, rechargeable lamps)	|__|__|__|__| GHc	|__|__|__|__| GHc
4.4 Education/School related expenditures	|__|__|__|__| GHc	|__|__|__|__| GHc
4.5 Funeral costs (if any)	|__|__|__|__| GHc	|__|__|__|__| GHc
4.6 Marriage/Wedding (if any)	|__|__|__|__| GHc	|__|__|__|__| GHc
4.7 Other ceremonies, dowry, gifts and presents	|__|__|__|__| GHc	|__|__|__|__| GHc
4.8 Travel/transport costs	|__|__|__|__| GHc	|__|__|__|__| GHc
4.9 Agricultural/household equipment	|__|__|__|__| GHc	|__|__|__|__| GHc
4.10 Agricultural or business inputs like seed, fertilizer, raw material, etc	|__|__|__|__| GHc	|__|__|__|__| GHc
4.11 Repayment of debt/interest	|__|__|__|__| GHc	|__|__|__|__| GHc
4.12 Alcohol, cigarettes, gambling	|__|__|__|__| GHc	|__|__|__|__| GHc
4.13 Saving	|__|__|__|__| GHc	|__|__|__|__| GHc
4.14 Lending	|__|__|__|__| GHc	|__|__|__|__| GHc
4.15 Household transfer payments/remittances (separate from lending)	|__|__|__|__| GHc	|__|__|__|__| GHc
4.16 Taxes, (e.g. property tax, income tax)	|__|__|__|__| GHc	|__|__|__|__| GHc

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SECTION 5: MEMBERSHIP IN COMMUNITY ASSOCIATIONS

Q No.	Questions and filters	Coding categories and codes	

5.1	In which groups are you or other members of your household a member?
	
	 [Read out answers. Circle all that apply; multiple answers possible.]
		Yes **No**
		 01 Self help group/cooperative society .... 1........2
		 02 Financial or savings group .... 1........2
		 03 Production group (agriculture/fishing) .... 1........2
		 04 Income generation group .... 1........2
		     (producing goods to sell) .... 1........2
		 05 Village committees (e.g. water, health,
		     schools or development) .... 1........2
		 06 Health organisation .... 1........2
		 07 Burial society or festival society .... 1........2
		 08 Religious or spiritual group....................... 1........2	

		09 *[name of local partner organisation]* .. 1 2	
5.2	Which other groups are you or any other member of your household member of? *[write in type/function of other group(s)]*	10 _____ 11 _____ 12 _____	
	[If no household member is member of any group at all, please skip to 6.1]		
5.3	Of all the groups to which members of your household belong, which two are the most important to your household?	Group 1: |___|___| Group 2: |___|___| *[Please enter code of group according to question 5.1 and 5.2]*	
5.4	How often does a member of your house-hold attend meetings of these groups? *[please take highest attendance of household members]*	More than once a week _____1 Once a week _____2 Once per two weeks _____3 Once a month _____4 Less than once a month _____5 Never _____6	
5.5	How actively does a member of your house-hold participate in *[call out name of Group 1 (Question 5.3)]* group's decision making?	Leader _____1 Very active _____2 Somewhat active _____3 Does not participate in decision making 4	
5.6	How actively does a member of your house-hold participate in *[call out name of Group 2 (Question 5.3)]* group's decision making?	Leader _____1 Very active _____2 Somewhat active _____3 Does not participate in decision making 4	
[According to the household roster, if no member of household is a member of the local partner organisation, please skip to question 6.1]			
5.7	How often does a member of your house-hold attend meetings of … *[local partner organisation]*? *[please take answer for most active member of household]*	More than once a week _____1 Once a week _____2 Once per two weeks _____3 Once a month _____4 Less than once a month _____5 Never _____6	
5.8	How actively does a member of your house-hold participate in *[local partner organisa-tion]* group's decision making? *[please take answer for most active member of household]*	Leader _____1 Very active _____2 Somewhat active _____3 Does not participate in decision making 4	

SECTION 6: ATTITUDES/TRUST			
Q No.	Questions and filters	Coding categories and codes	Skip to
6.1	Suppose you need to borrow a large amount of money. Where would you first try to bor-row it? *[please enter one answer only]*	Relatives ....01 Self help group/ Local NGO ....02 Neighbours & Friends ....03 Moneylender/Pawnshops ....04 Bank ....05 *[Name of local partner organisation]*...06 Cooperative ....07 Chief/Bigman ....08 Employer/Employer of other household member ....09 Someone you work with ....10 Teacher/village chief/local authority ....11 Other (specify) 12	
6.2	What do you think about the following state-ment? Suppose something unfortunate happened to someone in the village/neighborhood, such as a serious illness, or the death of a parent. How likely is it that some people in the community would get together to help this person?	Very likely ....1 Somewhat likely ....2 Neither likely nor unlikely ....3 Somewhat unlikely ....4 Very unlikely 5	

		[read out options]		
	[Read out] In the following I read some statements to you. For each statement, please tell me whether you *[Explain or show scale to respondent]* strongly agree/agree/neither agree or disagree/disagree/strongly disagree with them.			
6.3	Here is the first statement: If given the chance, your neighbours, colleagues and most people within the community would try to take advantage of you.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.4	In Ghana people like me and my family have a good chance of improving our standard of living.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.5	What one individual is unable to achieve alone many together can achieve.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.6	Have you ever heard of the NHIS?	Yes..1 No..2	➔ *[If no -> 6.11]*
6.7	What do you think about the following statement? Please use the scale again to show me how strong you agree or disagree: The people at the NHIS insurance scheme are familiar with the daily life of people like me and my family and know about my needs.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.8	The people at the NHIS care more about saving money than about getting you the treatment you need.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.9	As far as you know, the people at NHIS are very good at what they do.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.10	I do not expect anything good to come from NHIS.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.11	*[name of local partner organisation]* is familiar with the daily life of people like me and my family and knows about our needs.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.12	You believe *[name of local partner organisation]* will pay for everything it is supposed to, even really expensive treatments.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.13	*[name of local partner organisation]* cares more about their profit than about serving your needs.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	
6.14	As far as you know, the people at *[name of local partner organisation]* are very good at what they do.	Strongly agree ....1 Agree ....2 Neither agree nor disagree ....3 Disagree ....4 Strongly disagree....................................5	

6.15	You think the people at *[name of local partner organisation]* are completely honest.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.16	All in all, you have complete trust in *[name of local partner organisation].*	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
[Read out] Now, I read some statements about different institutions to you. Please use the scale again to show me how strong you agree or disagree:
6.17	I do not expect anything good to come from … *[name of local partner organisation]*.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.18	I do not expect anything good to come from government.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.19	I do not expect anything good to come from a bank.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.20	I do not expect anything good to come from a cooperative.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.21	Do you roughly know what insurance is and how it functions?	Yes..1 No..2	
6.22	How strong do you agree or disagree with this statement: Health insurance can help me to pay for costly health problems in my life.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.23	Paying the insurance premium regularly is a good investment.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.24	Overall, I am satisfied with the quality of the health care I can get in my area.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.25	My family and I can afford all health care we need.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.26	Doctors and staff at the health care facility you normally use will do whatever it takes to get you all the care you need.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	
6.27	Sometimes doctors and staff at the health care facility you normally use care more about what is convenient for him/her than about your medical needs.	Strongly agree ....1 Agree ....2 Neither agree nor disagree.....................3 Disagree ....4 Strongly disagree...................................5	

6.28	Medical skills of doctors and staff at the health care facility you normally use are not as good as they should be.	Strongly agree ....1 Agree ....2 Neither agree nor disagree......................3 Disagree ....4 Strongly disagree....................................5	

SECTION 7: WILLINGNESS TO PAY			
Q No.	Questions and filters	Coding categories and codes	Skip to
7.1	How easily have you been able to pay for medical bills in times of sickness of yourself or your household members?	Very easy .... 1 Easy .... 2 Neither easy nor difficult .... 3 Difficult .... 4 Very difficult 5	
7.2	Are you aware of the existence of the NHIS or other health insurance schemes that offer services for people like you?	Yes...1 No 2	
[Read out] Health insurance is where you make regular payments towards the future cost of medical care (treatment, hospitalisation, drugs, and so on). In case of sickness of an insured person, the health insurance scheme pays a major proportion of total medical bills. You pay your contribution and many others do the same. It saves you the financial burden of personally bearing all the medical bills in times of a sickness crisis as the payout can be more than you could pay in premium in years. Insured persons, who do not have any illness costs, do not get the premiums back at the end of the insurance period; instead, the premiums are kept by the insurance in order to pay for the medical bills of other insured persons or for expenditures in future years.			
[Read out] In case, somebody would offer you a health insurance for covering the major proportion of medical bills up to a ceiling of GHc 600 per year and per person.			
7.3	*[Please take out the payment card (Annex 3) and read out]* Please have a look at this card. For how much GHc or Gp per month would you be interested in buying such a health insurance package for yourself? Please choose the amount on the payment card as you would do for a real product. Thank you!	|___|___| ___|, |___| ___| GHc,Gp *[please write down the amount, which the re-spondent pointed to on the separate payment card]*	
7.4	This means, you would be inter-ested in the product, if it would cost *[please state the amount given in 7.3]*?	*[if no, please correct above figure to the preferred amount of the respondent]*	
[Read out] There could be also the possibility to contract a health insurance for your whole household. In the beginning of the interview, you said that your household consists of *[number of TOTAL household members as given in the household roster in section 0]* members.			
7.5	How many household members would you be interested to insure for health?	|___|___| household members	
7.6	*[Do not read out: Please calcu-late the starting price for the fol-lowing bidding game:]*	*[starting price = number of household members to be insured (as indicated in qn. 7.5) multiplied by premium given by respondent on the payment card in qn. 7.3]* *[write down your calculated starting price:]* |___|___|___|,|___|___| GHc,Gp	
7.7	Would you be interested to cover these members in your household with the premium of GHc/Gp *[starting price]*?	Yes, I would be willing to pay more.........1 No, I would be willing to pay less............2	

		[If yes, increase amount in next question. If no, decrease amount in following question]	
7.8	I will now call out several premium amounts and you say whether or not you would be willing to insure these household members for these prices. If you are not willing to pay as much, I will decrease the amount and ask you again. If you are willing to pay the amount, I will increase it and you decide again. Please indicate whether you would be willing to accept this price to buy the health insurance package for a premium of **[amount]** GHc,Gp for the household members you wish to insure per month?	*[Decrease/increase step-by-step the price as calculated in qn 7.6 by Gp 20; note first/last price when respondent agrees]* |___|___|,|___|___| GHc,Gp *[please write down the highest accepted bidding price]*	
7.9	If such an insurance product would be actually offered to you, would you be willing to insure your household with such a health insurance product?	Yes ....1 No ....2 Don't know 3	
7.10	What is your preferred frequency for payment of health insurance premium?	Every week ....1 Every month ....2 Every quarter ....3 Every 6 months ....4 Every 12 months 5	

[Please take out the nine cards showing the health insurance services (annex 4) and read out] A Health insurance package consists of several parts which are hospitalisation, primary care, consultations for traditional healers, pharmaceuticals/drugs, transportation, lab tests, x-ray and imaging services, and loss of income when ill. Most insurance schemes do not cover costs for all services.
Here, you see nine cards. Each card represents a typical health insurance service.

7.11.1	For which of these services are you willing to pay anything in a health insurance product? Please put aside the cards, whose service you would NOT wish to be insured for.	*[read out names of services on the cards]* *[after decision of the respondent, please code all services/cards that were put aside by the respondent as "0" in the RANK table below.]*	

[Read out] For all the other cards, please order them on the table/on the ground in terms of importance for you to be insured for this type of service.
[Code the most important card as 1, the second important card as 2, and so on for the other cards as well.]

RANK:

7.11.2	Hospitalisations (no maternity care and no deliveries)	|___|___|	
7.11.3	Primary care/ General Physician (allopathic)	|___|___|	
7.11.4	Consultations for traditional healer	|___|___|	
7.11.5	Pharmaceuticals/Drugs on prescription	|___|___|	
7.11.6	Maternity care (prenatal, deliveries, postnatal)	|___|___|	
7.11.7	Transportation of patient (decided by gatekeeper, e.g. health worker, General Physician, midwife)	|___|___|	
7.11.8	Lab tests	|___|___|	
7.11.9	X-Ray and imaging services		
7.11.10	Compensation for loss of income when ill	|___|___|	

SECTION 8: RISK AND RISK AVERSION		
Q No.	**Questions and filters**	**Coding categories and codes**

8.1	In the last 3 years, has your household been affected by any serious shock? *[Read answers. Circle all that apply. Multiple answers possible]*	**Yes** **No**
		01 Drought 1 2
		02 Flood...1 2
		03 Erosion of soil 1 2
		04 Fire...1 2
		05 Crime (theft of cash, assets or
		    livestock; destruction of assets) 1 2
		06 Dramatic changes of prices.............1 2
		07 Inability to sell products 1 2
		08 Loss of job 1 2
		09 High increase in fuel/
		    transportation costs 1 2
		10 Death of working adult
		    household member..........................1 2
		11 Death of other household member .1 2
		12 Serious illness or disablement of
		    working adult household member ..1 2
		13 HIV/AIDS 1 2
		14 Divorce/Separation 1 2
		15 Other (specify) 1 2	

8.2	Based on the list above, which were the three most severe crises for your household? *[Use codes of question 8.1]*	1) |___|___| 2) |___|___| 3) |___|___|	
8.3	Have these events led to a serious reduction in your asset holdings OR caused your household income to fall OR resulted in a significant reduction in consumption, OR caused indebtedness? *[read out answers. Multiple answers possible]*	Reduction of household asset holdings .....1 ..... 2 Loss of household income ....1 ..... 2 Reduction in household consumption ....1 ..... 2 Indebtedness ....1 ..... 2 Neither / no effects 1 2	
8.4	Looking ahead, which are the three most important risks that your household is exposed to in the future? *[Please rank in order Based on the list in qn 8.1]*	1) |___|___| 2) |___|___| 3) |___|___| If "15=other" used, please specify here: _____	
8.5	In your opinion, is your household more or less exposed to health shocks compared to other households in your town/ village? *[Read out options]*	Much more..1 More..2 About the same ....3 Less ....4 Much less 5	
8.6	Has a member of your household lost his/her job due to illness or taking care of a sick person in the last 12 months? *[not loss of income for time of illness]*	Yes ....1 No ....2 ⟶	*[skip to 8.8]*
8.7	Please estimate the annual income loss due to the loss of the job of this household member.	|___|___|___|___|___|___| GHc	
8.8	Did your household sell land/ livestock/machinery/clothing/any valuable due to any illness in your own household in the last 12 months, and if yes, what was the annual income-loss due to this sale?	|___|___|___|___|___| GHc	

8.9	When your household had to borrow money to pay for the costs of treatment you need to pay interest on it. Can you please estimate how much interest you paid for health related borrowing in the last 12 months?	|__|__|__|__| GHc	
8.10	How do you see yourself: are you rather willing to take risks to improve your living, or do you rather take careful steps?	Absolutely unwilling to take risks.............1 Unwilling to take risks..............................2 Neither willing nor unwilling ....3 Willing to take risks..................................4 Absolutely willing to take risks.................5	

SECTION 9: HOUSEHOLD INCOME & SOURCES			
We have almost finished this interview, just a few short questions on your household.			
QNo.	Questions and filters	Coding categories and codes	Skip to
9.1	What are the three most important sources of household income? *[Please rank the sources and use the codes of following options:]* 1 = Sale of farm/forest products 2 = Sale of livestock 3 = Sale of handcrafts 4 = Salaries 5 = Daily wages 6 = Cash transfers/remittances 7 = Credit/Borrowing 9 = Sale of other products 10 = Other (please specify)	Sources by importance: |__|__| 1st important |__|__| 2nd important |__|__| 3rd important	
9.2	How many members of your household significantly contribute to the household budget/income?	|__|__|	

[Read out:] For these household members *[as indicated in question 9.2]*, how much income do these members earn **monthly**? Please start with the person that contributes the most part.

9.3 Person ID	9.4 Salary *[fixed contract only]*	9.5 Labor *[daily wages/short term contract only]*	9.6 Income from own business/farm	9.7 Other income
(a) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(b) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(c) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(d) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(e) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(f) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(g) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(h) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(i) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc
(j) |__|__|	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc	|__|__|__|__| GHc

What business income does your household receive **annually** for products you grow or produce? I will ask how much you earn from selling and how much you need to reinvest. Here we go:

9.8	What is your household's annual income through sale of livestock, sale of farm products, sale of forest products, sale of handcraft products, of other products?	|__|__|__|__|__| GHc	

9.9	How much of this money do you need to reinvest in new livestock, seeds, raw material etc.?	|__|__|__|__|__| GHc	
9.10	What amount of money does your household receive on average in remittances or other transfers from relatives in urban areas per year?	|__|__|__|__|__| GHc	
9.11	How much money does your household receive from relatives based in other countries per year?	|__|__|__|__|__| GHc	
9.12	How much money does your household receive from private organisations (e.g., church, NGOs, donations by community members, etc.)	|__|__|__|__|__| GHc	
9.13	How much money does your household receive from governmental departments (e.g. social security benefits, pension, subsidies, other assistance etc.)	|__|__|__|__|__| GHc	
[Read out] Which of the following items do you use for own need from your farm/garden or get free instead of wages?			
9.14	Do you use grain/maize/foodstuffs from your own field or receive grain instead of wages?	Yes**.............................**1 No 2	*If no skip to 9.16*
9.15	What is the money-equivalent (the worth) of the grain/maize/foodstuffs that your household receives from your own farm or earns instead of wages during one year?	|__|__|__|__|__| GHc	
9.16	Does your household use fruit/vegetables or/and forest products from your own field or does your household receive fruit & vegetables or/and forest products instead of wages?	Yes**.............................**1 No 2	*If no skip to 9.18*
9.17	What is the money-equivalent (the worth) of the fruit, vegetables and forest products your household receives from the own farm or instead of wages during one year?	|__|__|__|__|__| GHc	
9.18	Do you get milk & dairy products from your own animals or receive milk & dairy products instead of wages?	Yes..1 No...2	*If no skip to 9.20*
9.19	What is the money-equivalent (the worth) of the milk and dairy products your household receives from the own farm or earns instead of wages during one year?	|__|__|__|__|__| GHc	
9.20	Does your household get other goods from your farm or business or does your household receive it instead of wages?	Yes..1 No...2	*If no skip to 9.22*
9.21	What is the money-equivalent (the worth) of all other things your household receives from the own farm/business or earns instead of wages during one year?	|__|__|__|__|__| GHc	
9.22	How many rooms in your household are used for sleeping?	|__|__| room(s)	
9.23	What is the **main** source of drinking water for members of your household during the current time of year? *[read out options]*	Piped water ....1 Private well....................................2 Public well ....3 Spring ....4 River/stream ....5 Pond/lake/dam ....6 Rainwater ....7 Other (specify) ....8 Borehole ....9 Sachet ('pure water").....................10	
9.24	Kindly tell me the major household assets that you own?	<u>Yes</u> <u>No</u> Landline/fixed phone ....1 .... 2 Cell Phone.....................................1 .... 2 Television ....1 .... 2 Satellite dish ....1 .... 2 Mattress...1 .... 2 Refrigerator ....1 .... 2 Electric or gas cooker....................1 .... 2 Radio ....1 .... 2 Car...1 2	

XXX

		Bicycle ....1 .... 2 Motorcycle ....1 .... 2 Computer ....1 .... 2 DVD-Player ....1 .... 2 Sewing machine 1 2	
9.25	Does your household have access to electricity in the house?	Yes ....1 Yes, partly ....2 No 3	
9.26	Does your household have…? If so, how many?	Land (acres) ....|___|___| Agricultural equipment (large machines, such as tractor, truck) .|___|___| Buildings ....|___|___|	
9.27	Does your household have…? If so, how many?	Cattle ....|___|___| Goats ....|___|___| Pigs ....|___|___| Chicken ....|___|___| Sheep ....|___|___| Guinea fowls ....|___|___| Ducks ....|___|___| Donkeys ....|___|___|	
9.28	In general, what are your views about the NHIS? *[interviewer, please probe for more information on this]*		

This is the end of the questionnaire.
Thank you for answering so many questions.

[Please enter end time on cover sheet -> 0.6]
Remarks/problems faced during the interview:

Appendix 6: Codes for Classification of Diseases and Related Health Problems (Annex 2a to the Questionnaire)

[Please code according to the classes. Code 888, if it is NOT possible to associate information by respondent to these classes]

Code	Class of disease or related health problem
01	**Infectious** and **parasitic** diseases (e.g. **worm infection, malaria, HIV/AIDS**)
02	Neoplasms (e.g **cancer, tumor**)
03	Diseases of the **blood** and **blood-forming organs** and certain disorders involving the **immune mechanism** (e.g. **vitamin deficiency/anaemia**, iron deficiency/anaemia)
04	Diseases of the **circulatory system** (e.g. **heart**, veins, arteries, blood supply system)
05	Diseases of the **respiratory system** (e.g. **airways, lungs**, breathing)
06	Endocrine, **nutritional** and **metabolic** diseases (e.g. **diabetes** mellitus, hormonal disorders)
07	Diseases of the musculoskeletal system and connective tissue (e.g. **arthrosis, arthritis**)
08	Diseases of the **digestive system** (e.g. **stomach, intestines**, esophagus/gullet)
09	Diseases of the **nervous system** (e.g. **meningitis, alzheimer's disease, epilepsy, multiple sclerosis**)
10	**Mental** and **behavioural** disorders (e.g. dementia, schizophrenia, depression)
11	**Injury, poisoning** and certain other consequences of **external causes** (e.g. **fracture, wounds**)
12	External causes of **morbidity** and **mortality** (e.g. **accidents, falls,** complications of medical and surgical care)
13	Diseases of the **genitourinary system** (e.g. **urinal tract infection, veneral diseases**)
14	**Pregnancy, childbirth** and the puerperium (e.g. **abortion, complications during pregnancy, complications during delivery**)
15	Certain conditions originating in the **perinatal** period (e.g. **fetus and newborn** affected by maternal factors, **birth trauma, illnesses of fetus and newborn**)
16	Diseases of the **skin** and subcutaneous tissue (e.g. **abscesses, skin rash, eczema**)
17	Diseases of the **eye** and adnexa (e.g. **inflammation/disorders of eyelid, visual disturbances and blindness**)
18	Diseases of the **ear** and mastoid process (e.g. **hearing loss, inflammation/disorders of ear function**)
19	Congenital malformations, deformations and **chromosomal abnormalities** (e.g. **malformations and deformations of the musculoskeletal system,** malformations and deformations of special parts of body, Down's syndrome)
20	**Symptoms, signs** and **abnormal** clinical and laboratory **findings**, not elsewhere classified (e.g. **fever, fatigue, headache, pain of unknown origin, abnormal findings without diagnosis**)

Appendix 7: Codes for Symptoms/Illnesses (Annex 2b to the Questionnaire)

Codes for Illnesses

Infectious Diseases
1. Buruli ulcer
2. Cholera
3. Diarrhoea/Dysentery
4. Diphtheria
5. Hepatitis (A,B,C)
6. Histoplasmosis/Darling's disease
7. HIV/AIDS
8. Jaundice
9. Leprosy/Hansen's disease
10. Measles
11. Poliomyelitis
12. Rabies
13. Salmonella Infection/Food poisoning
14. Sexually transmitted disease
15. Shigellosis/Bacterial infection
16. Small pox
17. Tetanus
18. Tuberculosis/TBC
19. Typhoid fever/Typhus
20. Yellow Fever

Parasitic Diseases
21. Malaria
22. Parasitic infection (Amoebiasis, Schistosomiasis, Worm infection)
23. Sleeping sickness/ Trypanosomiasis

Neoplasms/Cancer
24. Cervix Cancer
25. Gullet cancer
26. Lung cancer
27. Stomach cancer
28. Uterus cancer
29. Cancer (other)

Diseases of the circulatory system / cardiovascular diseases
30. Cardivascular disease
31. Cerebrovascular diseases
32. Coronar heart disease
33. Heart attack/Myocardial infarction
34. Hypertension/High Blood Pressure
35. Ischaemic heart disease/undersupply of blood/blood anemia in heart
36. Stroke/Post stroke
37. Rheumatic fever
38. Rheumatic heart disease

Diseases of the respiratory system
39. Angina pectoris
40. Asthma
41. Bronchitis
42. Chronic lung disease
43. Common cold & cough
44. Influenza
45. Lung disease
46. Pneumonia
47. Pharyngitis/Sore throat/Tonsillitis
48. Pleural effusion/Effusion of thorax
49. Upper respiratory tract infection
50. Water in lungs/lung oedema

Endocrine, nutritional and metabolic diseases
51. Diabetes mellitus
52. Disorders of thyroid gland
53. Malnutrition
54. Metabolic disorders
55. Obesity and other hyperalimentation
56. Other nutritional deficiencies (e.g. iron or vitamines)

Diseases of the musculoskeletal system and connective tissue
57. Arthritis
58. Arthrosis/Decline or mutilation of joints

Diseases of the digestive system
59. Crohn's disease
60. Gastroenteritis
61. Haemorrhoids/Piles
62. Liver disease

Diseases of the nervous system
63. Alzheimer Disease
64. Epilepsy
65. Parkinsons' Disease
66. Multiple sclerosis
67. Meningitis

Injury, poisoning and certain other consequences of external causes /External causes of morbidity and mortality
68. Appendicitis
69. Burn/Burns
70. Fracture
71. Head injury
72. Hernia

Diseases of the genitourinary system
73. Cystitis/Urinal tract infection/Bladder infection

74. Herpetic lesions
75. Nephritis/Nephrotic syndrome
76. Veneral disease (disease of the genitals, genital warts*)*

Pregnancy, childbirth and the puerperium/ Illnesses in perinatal period
77. Abortion/termination of pregnancy

78. Anemia (due to pregnancy)
79. Caesarean
80. Delivery (with complications)
81. Delivery (no complications)
82. Eclampsia/Preclampsia (cramps, high blood pressure, pass out, fits and headache)
83. Pregnancy induced hypertension

84. Pregnancy induced diabetes
85. Uterus Removal

Other
86. Disease of the blood and blood-forming organs
87. Pigmentary abnormality/ Albinism
88. Mental and behavioural disorders

Codes for Symptoms/Treatments

Symptoms involving the circulatory and respiratory systems
89. Difficulty breathing
90. Heart problem/pain
91. Pain in chest
92. Pain in throat

Symptoms and signs involving the digestive system/abdomen
93. Abdominal and pelvic pain
94. Nausea and vomiting
95. Stomach problem
96. Heart burn (Hyperacidity)

Symptoms involving the skin
97. Localized swelling, mass and lump of skin and subcutaneous tissue

98. Skin rash

Symptoms and signs involving the urinary system
99. Pain associated with urination
100. Urinary incontinence

Other
101. Backache
102. Boils on body
103. Chills (feeling hot and cold)
104. Coughing blood
105. Cramps
106. Ear pain
107. Fainting
108. Febrile fits/seizure/convulsion
109. Fever
110. Hand pain
111. Headache (severe)

112. Itching
113. Joint pain
114. Knee pain
115. Leg pain
116. Loss of appetite
117. Neck pain
118. Nose bleeding
119. Oedema
120. Sore skin
121. Stomach Pain
122. Swelling of hands/legs
123. Teethache
124. Uterus problem/menses problem
125. Weakness/Fatigue
126. Weight loss
127. Wound

Other symptoms/illness
[For other symptoms/illness, please write in the questionnaire!]

Appendix 8: Payment Card: Ghana
(Annex 3 to the Questionnaire)

For how many Cedis per month would you be interested in
buying a health insurance package for yourself?

0	1 GH¢
20 Gp	1.50 GH¢
30 Gp	2 GH¢
40 Gp	3 GH¢
60 Gp	4 GH¢
80 Gp	5 GH¢ or more

Appendix 9: Cards with Health Insurance Services (Annex 5 to the Questionnaire)

Transportation of patient

Lab tests

Compensation for loss of income when ill

X-Ray and imaging services

Hospitalisation (no maternity care and no deliveries)

Primary care/ General Physician (allopathic)

Consultations for traditional healer

Pharmaceuticals/Drugs on prescription

Maternity care (prenatal, deliveries, postnatal)

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