

What do we know about the impact of microinsurance?¹

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Introduction

Economic crises, natural events and social shocks are main hindrances to escaping the cycle of poverty. More so than the rich, the poor cannot cope well with illness, death of the bread winner, death of livestock, loss of property, droughts and crop failure. Many development efforts, for instance microfinance projects, offer ways to alleviate poverty. The limited ability of the poor, however, to cope with these risks and economic shocks reduce the potential effects of such efforts. Over the last decade, the development sector has increasingly recognized that the poor require risk management techniques (e.g. Holzman et al, 2001; 2003; Morduch, 2006; ILO-STEP/GTZ, 2006; Schmidt et al, 2006; Radermacher et al, 2008). Protecting the poor against life's uncertainties is a priority to fight against poverty and thus an important component to achieve the Millennium Development Goals.

For low-income people not traditionally covered by insurance, financial protection schemes that reduce vulnerability to unexpected and catastrophic life shocks have been made available. Collectively referred to as microinsurance, these schemes can cover loss or injury to health, property, crop, weather and life or similar risks.

There is no single and simple definition of microinsurance today though. We apply a broad definition of microinsurance, out of which the definition of insurance is the simpler part: Insurance is the provision of financial protection contingent on the occurrence of a predefined risk in exchange for an ex-ante premium payment. Insurance functions through pooling the risk of various insured and diversifying their risk over larger numbers. Following this definition, social assistance programs (such as targeted cash transfers) and fully subsidized insurance schemes are not included in this review.

The "micro" definition is more complicated; we accommodate different approaches. One approach understands "micro" as reference to low premium and low benefits, i.e. micro refers to the product. Another, related, definition of "micro" refers to the poor as the target market, regardless of the institutional arrangement which delivers insurance (Churchill, 2006).

Yet a further one, with health insurance focus, includes all kinds of community health financing arrangements (Preker et al, 2002), not all of them necessarily in line with our definition for insurance. The "micro" here refers to the involvement of the community into administrative and managerial tasks. The common feature within all, is the active

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involvement of the community in revenue collection, pooling, resource allocation and, frequently, service provision.

A similar, somewhat broader definition, opposes “micro” and “macro” level focus of decision making, e.g. in terms of claim settlement, decision to affiliate and premium collection. Thus, microinsurance is the use of insurance as an economic instrument at the “micro” (i.e. smaller than national) level of society (Dror, Jacquier, 1999). This excludes compulsory social security schemes launched by the government and made compulsory for the entire population (e.g. Chinese cooperative insurance (Bogg et al, 1996; Wagstaff et al, 2009) or which target a narrow set of beneficiaries not defined by income status (e.g. Egypt's school health insurance) or heavily subsidized schemes like Colombia's subsidized insurance scheme (Trujillo, Portillo, Vernon, 2005). However, the line of demarcation is not easy to draw.

The field of microinsurance is experiencing tremendous growth, with microfinance units, communities, government agencies and private insurance companies serving as providers. Policy makers in governments, national and international development agencies and the civil society are considering whether investing in policies and programs supporting microinsurance is worthwhile (Siegel et al, 2001; ILO-STEP 2006; Schmidt et al, 2005; Tabor, 2005; Radermacher et al, 2008 and IAIS/CGAP, 2007). This decision needs to be answered in the light of the potential impact microinsurance can achieve. Unlike microfinance that has seen a considerable number of impact assessment studies (Swain and Wallentin, 2009; Maldonado and González-Vega, 2008; Kondo et al, 2008; Hartarzka and Nadolnyak, 2007 and; Brau and Woller, 2004), the field of microinsurance is still very new and it is even unclear where to look for the impact.

A study conducted by Young et al (2006) have contributed to this methodological aspect by identifying and refining indicators that can be used to assess the impact of microinsurance. This study proposes a causal model that presents several hypotheses and identifies areas or 'domains' of impact that can be expected to change as a result of being insured. The authors posit that causal pathways and impacts of microinsurance are considerably more nuanced than those of micro-credit or micro-savings, in a way that indicators used to measure the impact of micro-credit and micro-savings probably do not apply. A number of studies have scrutinized the impact of microinsurance on the poor; however there is little comprehensive review of these studies.

Jakab and Krishnan (2001) summarize the literature on community involvement in health care financing. The authors declare that the evidence on the performance of the community financing schemes (broadly defined) is limited. Further, there is evidence to suggest that community financing is effective in social inclusion by including a large number of low-income populations. Finally, members of community-based health financing schemes are reported to have increased their utilization of health care services while reporting lower out-of-pocket spending.

In addition, ILO-STEP-Universitas (2002) summarize the evidence of community-based health organizations (CBHO) on its impact on members and the society at large. The study concludes that no evidence can be found from the reviewed documents that CBHOs positively impact the health status, utilization of services and financial protection

of its members. The authors claim that the lack of data hindered the process of conducting an acceptable quality meta-analysis and the studies were not completely free of bias.

To date, only one systematic review in the domain of microinsurance has been conducted. In 2004, Björn Ekman published a systematic literature review of the impact of micro health insurance schemes (Ekman, 2004). Ekman's research question was limited to whether voluntary, not-for-profit; health insurance products impact resource mobilization and financial protection for the poor. Ekman's review uncovered strong evidence that community-based health insurance provides some financial protection by reducing out-of-pocket spending, moderate evidence that such schemes improve cost-recovery and weak to no evidence that these schemes effect quality or efficiency of care.

The field of microinsurance has considerably grown since Ekman's review; different insurance schemes include life, funeral, death, crop, weather, property, and health insurance. There is a push within the microinsurance field and the policy level towards composite products that cover a range of these risks. Dercon et al. (2008) provide the most recent summary of the literature available on microinsurance. By providing an overview of the current state of research, the authors identify key knowledge gaps and develop a conceptual framework for future research in the area of impact evaluation, demand and supply issues in microinsurance. However, a narrative review is adopted rather than a systematic review.

We attempt to help narrow this gap and review research available on the impact of microinsurance. This review seeks to answer the question: Do microinsurance programs achieve impacts on beneficiaries and their households? And what is the status of impact review on the microinsurance sector? This review will answer these questions by conducting a systematic literature review on the impact of microinsurance and thus adds a methodological view to the narrative reviews currently available.

The review will cover studies conducted on the range of microinsurance products available and determine whether the lessons learned in Ekman's review apply to other microinsurance products (life, credit etc.) and what new insights can be shown in the field of health insurance. First, the results of this review will identify the impacts of microinsurance in several outcome dimensions. Secondly, this review will separately identify impacts in these dimensions of impact and identify research and knowledge gaps. Finally, targeted efforts can then be taken to fill these gaps and further support policy makers and microinsurance providers with evidence on the most effective ways to positively impact clients and households.

Methodology

The systematic approach adopted in this review follows principles suggested by the Cochrane Handbook for Systematic Reviews of Interventions (2008) and the Campbell

Collaboration (www.campbellcollaboration.org); however, we are more open to consider qualitative studies.

A systematic review of literature develops a study protocol that clearly specifies the following: (a) a specific research question, (b) pre-defined inclusion criteria for studies, (c) an explicit reproducible methodology, (d) a systematic search strategy that attempts to identify all studies that would meet the inclusion criteria, (e) an assessment of the validity of the findings of the included studies (through the assessment of risk of bias) and (f) a systematic presentation, and synthesis, of the characteristics and findings of the included studies.

As our aim is to produce a snapshot of the current knowledge about impact in the microinsurance space, we define rather broad research questions, as outlined in the previous section. The inclusion criteria were defined:

1. Types of study (study focus): Change of economic or social parameters of insured clients or their households, either compared over time, to an uninsured control cohort or at best both. Inclusion of subjects into the cohorts must be random or quasi-random.
2. Participant/population characteristics: Poor segments of the population. Poor defined by either earning half the average income of a country (proxy of GNI per head used as reference (World Bank, 2008)) of a (developing) country's population or by living below a poverty line of \$2 per day (PPP). Studies which did not present solid data on these population characteristics were included if it could be reasonably expected that the population fell into one of the two criteria.
3. Intervention characteristics: The intervention is microinsurance. Microinsurance may include: life, health, property, funeral, crop, weather, livestock or similar risks.
4. Setting/location: Low and middle income country, following a World Bank definition.
5. Outcome Measure Characteristics: Report a measurable change on the economic or social situation of the insured client or the household the client lives in. The impact measured against a benchmark (preferably a quantitative proxy). The review was open to accept qualitative proxies if the methodology with which there were obtained was judged solid by the review team.
6. We assessed the validity of the findings by flagging potential biases which might have influenced the reported results. An assessment of a potential bias differs from the assessment of the quality of the study: quality assessments take a broader perspective, looking at the steps undertaken in the study and the completeness of the report (AHRQ, 2002; Ekman, 2004); we do not judge on this in this paper. A risk of bias instead describes the possibility that the reported results systematically over or underestimate the outcome. All impact assessments face a critical problem: the impossibility to compare the effect of a treatment on one person with the status of the same person untreated. Defining a suitable control unit is thus essential. However, a microinsurance program might have been offered to certain people only, which are for instance affiliated to a local microfinance institution or live in a certain location. These might have different attributes than those to whom the insurance was not offered. This

constitutes a selection bias, which reduces the comparability of the groups. Randomizing to whom insurance will be offered and to whom not might help overcome this problem.

Out of those who are offered to join a voluntary insurance, not everybody might join. Those who join again are likely to differ in economic status, experience or attitudes from those who decided not to join. People with certain attributes might thus self-select themselves into microinsurance program. Even randomization cannot eliminate this problem; some statistical methods can be used to reduce it though and comparison of insured and non-insured cohort can at least inform about observable differences (though there might be plenty of unobservable).

As much as information permits, we assess the risk of bias of each study and report about it in this review. When assessment is impossible due to lack of information provided, but seems highly likely, reporting about a study will be omitted in order to avoid generating wrong impressions about potential impact. We furthermore assess the methodological approach and exclude studies in which the methodology used cannot reasonably lead to the conclusion presented. Examples of inadequate methodologies which led to exclusions were very small samples on which parametric analysis was applied; or respondents selected by the insurance manager and interviewed in his presence. The assessment of the adequacy of a methodology is context specific and discussed in the team.

7. Languages: We searched for studies in four languages (English, Spanish, French and German). The search strategy employed an extensive list of keywords to search: electronic databases, hand search and search conducted with the help of experts (Microinsurance Network, direct mailing). The databases searched were the following: BIOSIS, CINAHL, Cochrane Library, Current Contents Clinical Medicine, Current Research in Britain (CRIB), Econlit, Elsevier Science Direct, Erasmus University Library Online, Google Scholar, IDEAS, Ingenta, Interscience (Wiley), NCBI, PubMed/MEDLINE, Psych Lit, SSRN, Science Citation Index/Web of Science, Scirus, Social Sciences Citation Index, Social Services Abstracts, Sociological Abstracts/Sociofile, PROQUEST and System for Information on Grey Literature in Europe (SIGLE). Further, the websites of Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Microinsurance Network, World Bank, the WHO (this would only yield results for MHI), PAHO, ILO, UNDP and USAID were searched. The search was conducted between January and June, 2009.

The vastness of search terms yielded a sizeable number of hits while conducting the electronic search. To refine the process, restrictions were imposed when possible. Upon completion of the electronic searches, the studies were reviewed for final selection. For the decision on inclusion or exclusion of studies a checklist along the criteria outlined above was applied that lead to a two level process. In Stage I, each reviewer was given a subset of the retrieved citations (title, publication details and abstract) and applied the inclusion criteria listed

below. This stage was predominantly an onscreen inspection that further reduced the number of studies.

A study which did not meet the first three criteria was excluded based on the decision of one researcher. Any refusal in the following criteria required confirmation by a second researcher. An inclusion decision also needed to be reconfirmed by a second researcher.

One person decision	Location/setting characteristics: Is the study focusing on low and middle income countries?
	Population characteristics: Is the study dealing with the poor?
	Intervention characteristics: is the study dealing with microinsurance?
Two person decision	Study type: Is the study dealing with impact?
	Outcome measures: Is the study applying outcome measures which can be reasonably expected to answer an impact question?
	Potential for bias: What biases might the results face and how are they handled?

In case of negative judgement of the first researcher on any of the issues requiring decision by two researchers, the study was forwarded for the second researcher's assessment. In cases of dispute which could not be resolved by discussion, a third researcher made the judgement call.

As a next step, the data from the finalised papers were extracted and allocated to different impact dimensions.

Results

Available studies: risk and geographic focus

This review includes 31 studies, which report on the impact of 118 different insurance schemes; a number of studies report on the same schemes, often on different aspects of their impact. Numerous studies report on the impact of several insurance schemes, whose impact is often described in aggregated terms. We disaggregated these studies where possible for analysis purpose and to enable us present reports on the same insurance scheme next to each other. The table in the annex provides an overview about the studies.

Impact assessments on health insurance are clearly most frequent. In fact only two studies not focussing on health made their way into this review: Hintz's (2009) study on the impact of credit life insurance in Indonesia and the study of Cai et al (2009) on livestock (sows) insurance in China. Both are very recent publications. Other studies

which looked at non health insurance products suffered from methodological flaws or intransparent presentation (e.g. Sync Consult, 2006).

Impact research so far has a clear geographical focus: All included studies scrutinized the impact of insurance in Africa or Asia (17 and 14 publications on Africa/Asia respectively); studies from Latin America were often not compatible with the definition of microinsurance and were either Social Insurance Programs or subsidized schemes, which did not meet the insurance definition.

Within Africa and Asia few countries stand out; most impact assessments and reports on it are available for Rwanda, the Democratic Republic of Congo and India. The largest number of microinsurance schemes was assessed in Rwanda. Upward of fifty schemes were assessed and reported about in various publications. Data sources are similar and have mostly been created in relation to a Partnership for Health Reform project. In the Democratic Republic of Congo five different insurance schemes have been assessed by groups around the Institute for Tropical Medicine in Antwerp. In India also five different schemes have been assessed by different researchers with different data sources.

Methods used

Most studies (26) use administrative data to assess impact. This data is either health care provider data, which is used to compare health care utilization by insured and uninsured; or it is data of the insurance scheme. Devadasan et al. (2007) as well as Ranson (2002) use a simple but interesting approach to assess the effect of the insurance on the insured (effect of treatment on treated). They reviewed claims registers and compared the situation of the insured after reimbursement to a hypothetical situation without insurance (no claim). While the approach might give some indication, it comes with some difficulties: for one, it would not be known whether the persons would have gone for the same treatment if they were not insured; further, the method cannot capture those insured, which for some reason did not claim. The external validity is reduced; however, the approach is simple and cost efficient and can thus be used more easily by microinsurers themselves to obtain an indication.

Only eight studies which passed the quality assessment used qualitative tools; some supplemented other tools with the qualitative information. Twenty two studies created primary quantitative data through household surveys, with the vast majority using a cross-sectional design and only few created time series data.

The analysis of quantitative information, both from administrative data and surveys, in the studies reviewed is mainly descriptive (21) with some significance testing. This is particularly true for administrative data, where information needed for multivariate analysis is often lacking. Multivariate analysis, usually some regression models, is used in 18 cases; in two cases concentration indices are constructed. Such regression analysis, which can control for some confounding effects, is most often applied when primary quantitative data has been created.

There are not many qualitative studies focusing on impact, which apply a methodology which is well described and transparent. Many studies fail to reveal the number of

interviews conducted and to describe the methodology used for analysis. As this makes it impossible to assess their robustness these interesting studies must be disregarded (e.g. Mosley 2003, Moneti 2004). A refreshing qualitative study is provided by Hintz (2009) though; he reports in detail about the source of information, provides an analytical framework and reviews critically the limitations of his own study.

Research focus and outcome measures

We have identified six main research questions which were scrutinized in the various studies. Not surprisingly, financial protection and impact on health care utilization were the main foci of most studies conducted. We have listed the impact on maternal care and equity separately as these fields attracted the focus of various studies; reduction in out of pocket spending for maternal care is however included in the financial protection category. Two currently more “exotic” research foci are increase in asset base and impact on social network. Both were subject of the qualitative study conducted by Hintz (2009) but increase in asset base is also the core question behind the study of Cai et al (2009) – both the most recent impact studies published.

A variety of different outcome measures has been used; while some of them are not exactly the same they can be made comparable. We thus grouped them into fewer categories, instead of listing their nuances in detail. Some outcome measures aim to contribute answering the same research question but the measures are too different to be combined.

We aimed to avoid double reporting, i.e. listing an analysis of the same data on the same insurance scheme twice when published by different authors or in multiple publications by the same author. Some studies also use some data, which is used by others as separate outcome measures, to analyze in more detail their key outcome measure – in such cases the data is not reported as separate outcome measure but attached to the main measure.

Table I lists the research questions, the outcomes measures applied in the studies, the number of studies which applied these outcome measures and how many of those detected positive impact. The difference between the latter two columns is the number of studies which have not found positive impact or even found negative.

The impact of microinsurance

Even though the reliability of most of the studies suffers to varying degrees of (mainly (self-)selection) bias which cannot be quantified, a coherent picture unfolds with regard to the impact of microinsurance, which is pronounced strongest in the research question on health care utilization: Fifteen studies assessed the impact of micro health insurance on the utilization of inpatient care; thirteen out of these studies were able to find a positive relationship. This finding is supported by outcome measures on the use of modern health care facilities and outpatient care. Studies also provide evidence for potential equity effects of insurance; though one study also found the uninsured to enjoy more equitable access (Dror et al, 2009). The evidence for effects of microinsurance on issues related to maternal care is less strong although there are clear indications that microinsurance can improve the number of deliveries at a modern facility and to some extent prenatal visits.

Many studies looked into the key function of insurance: providing financial protection. Fifteen studies scrutinized the impact of microinsurance on out of pocket spending and eight found a positive relationship. Three assessed protection against catastrophic health costs and all report a positive relationship.

One out of two studies, which is methodologically very strong, provides evidence on changed production pattern and thus an increase in the household asset base (Cai et al, 2009). It is Hintz (2009) who points the attention to a potentially negative impact of microinsurance on the social network of the insured.

Table I:

Research Question	Outcome measure	No of studies applying	Positive impact detected
FINANCIAL PROTECTION			
	Use of funds to cover living expenses	1	0
	Reduction in out of pocket spending	15	8
	Incidence of out of pocket payments	2	2
	Catastrophic health expenditure	3	3
	Burden of health cost relative to income	1	0
	Annual health expenditure relative to income	1	1
	Share of households falling under poverty line	1	1
	Increase in normalized poverty gap	1	1
	Selling of food to cover health costs	1	1
HEALTH CARE UTILIZATION			
	Respective share of outpatient visits at a given facility	4	4
	Probability of consulting the health post	3	2
	Odds of visiting a health post at least once a month	1	1
	Health provider utilization during illness episode	3	3
	Inpatient care utilization	15	13
	Overcoming spatial exclusion	1	1
	Length of hospitalization	1	1
	Use of modern provider	5	4
	Number of outpatient visits	5	5
	Number of inpatient visits	1	0
	Use of preventive services	1	1
	Drug compliance	1	1
	Chronic disease detection	1	1
	Probability of at least one provider visit	1	1
	Childhood immunization	1	0
EQUITY			
	Concentration index for hospital	5	4
	Equity with regards to consultations	1	1
	Equity with regards to professional attendance while delivery	1	0

MATERNAL CARE	Utilization rates among poor	1	1
	No of institutional deliveries	2	2
	Delivery at modern facility (binary)	7	4
	Use of prenatal care	7	2
	Prenatal visits in the first trimester of pregnancy	2	1
	Professional attendance during deliveries	2	2
INCREASE IN ASSET BASE			
	Increase in asset base	2	1
EFFECT ON SOCIAL NETWORK			
	Gift giving in social network	1	(negative)

Discussion & Conclusion

We identified a number of studies which investigate the impact of microinsurance. The number of studies seems to be increasing in recent times and there are indications that more impact studies are under way.

The vast majority of the studies focuses on health insurance – which is surprising as most microinsurance policies are sold in life insurance (Roth, McCord and Liber, 2007). Due to the large number of studies from Africa, many impact assessments deal with mutual insurance schemes.

The research focus of most studies is on issues related to health care utilization. Studies provide evidence that microinsurance has the potential to increase access to care – and even might help for more equal access. This aspect is more disputable though as many studies also show that poorer segments of the population are less often insured (Gnawali, Pokhrel, Sié et al, 2008; Jütting 2004, Jakab et al. 2004, Criel and Waelkins 2003, Bennet and Gilson 2001, Schneider and Diop 2001, Bennett 1998, Criel 1998, Ensor 1995, Arhin 1994; Ranson (2001) however finds that the poor are not excluded) or the better off benefit more from membership in the insurance (Jütting 2004). In many settings equity might thus not develop, when the poor are unable to enrol. Some schemes offer price discrimination to overcome exclusion of the poor, e.g. the community health insurance pilots in Afghanistan (Rao et al, 2009). Such price discrimination which keeps membership open for all, as opposed to an exclusive program targeting only the poor, might integrate better into the informal financial linkages of the poor. Townsend (1994) has shown that consumption in village India is less influenced by fluctuations in an individual's earning than by fluctuations in village average consumptions, i.e. people live in networks, not alone. And so do the poor. Price discrimination in a system open for all might thus be more effective than a targeted and exclusive program.

Back to the review though; the evidence on financial protection is weaker than on health care utilization. Studies find indications that microinsurance reduces out of

pocket expenditure; but other studies fail to corroborate this. Some studies look at catastrophic protection and present evidence. However, their method of constructing a hypothetical counterfactual is questionable as it is bound to show impact: if the focus is only put on those being on record for having received a claim payment, it is not surprising that they are better off with the payment than with the hypothetical situation without. The method also does not allow controlling for self-selection bias; a frequent problem when using administrative data.

The self-selection bias is one of the main problems in the impact evaluation of voluntary microinsurance, like in other social programs. Some people are more likely to take up the offer than others and many of the studies reviewed found evidence for differences between these cohorts. This reduces the comparability of the results for each cohort considerably and leaves a degree of uncertainty attached to a potential causal relationship of insurance and observed outcome. Few studies have applied statistical techniques to reduce the self-selection bias; one such technique is propensity score matching, where – stated simple – an individual (or household) from the insured cohort is matched with an individual from the uninsured cohort, which displays certain similar patterns (a conditional probability is calculated for each household to be treatment or control). But even when many covariates are taken into account, the method cannot overcome the self-selection bias fully (Gnawali, Pokhrel, Sié et al, 2008). Social experiments face more difficulties to avoid the self-selection bias as compared to clinical studies. Evidence is thus often weaker than in clinical studies.

When using administrative data this problem might arise more often, as rarely information to control for self-selection is available. Primary data is certainly not less prone to bias. The problem of self selection bias remains. Only few studies take adequate statistical methods to reduce the bias; too many though apply an analysis which does not control for this problem.

A further problem in many studies is the lack of supporting information, making it difficult to assess the quality of a study. A considerable number of studies use administrative data from health care providers to compare the number of insured and uninsured using the services. However, many studies fail provide information about alternative health providers in the area, making it difficult to judge whether the data obtained from one provider simply reflects a higher concentration of insured with this provider, or whether indeed insured seek more (qualified) care. It is difficult to assess how representative the data is (what a random sampling would try to achieve in a survey). Such information is also essential to assess the external validity of a study: how much can results be generalized beyond the respective setting?

Another problem in the body of literature is the publication bias. It can be expected that many studies which have not found any impact are not reported. We tried to obtain unpublished reports, but assume that much has not reached us.

It is interesting to note, that only in very recent studies (Hintz, 2009; Cai et al, 2009) research questions beyond the narrow focus of financial protection and utilization of

health care have been formulated. The microinsurance sector is yet to understand that microinsurance might have an impact on many levels and dimensions. Young, Mukwana and Kiyaga (2006) have formulated pointers in this direction; these have not yet been elaborated much further and more empirical results on non-traditional lines of potential impact are desirable.

But even with a focus of the existing studies on health care utilization and financial protection, the variety of outcome measures which aim to say the same is large, streamlined and standardized indicators are missing. Such streamlined and standardized indicators are required for meta-analysis: not only to make results more robust, but to be able to learn what features of an insurance scheme are more likely to yield positive impact. Such learning is required for a sector which is as fast developing as microinsurance. Such learning can guide the way for an efficient development of the sector. Standardized outcome measures, detailed information about the environment in which a microinsurance scheme is being implemented and improvements in the methodologies which help reduce bias in results are needed to advance from an understanding of “whether” microinsurance has an impact to “why”. This defines good impact evaluations (Hintz, 2009; Deaton, 2009), so that they can lead a way. An eclectic approach combining qualitative and quantitative methods seems most suitable for this. Quality guidelines for these studies need to be developed as even established impact networks like the Campbell Collaboration still struggle to define such standards for evaluations beyond randomized experiments – we struggled with them in this review.

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Author	Year of publication	Country	Name of the microinsurance scheme	Research question	Method of assessment	Outcome measure	Sample size	Risk of bias*	Method of analysis	Results	Remarks
Life insurance											
Hintz	2009	Indonesia	Payung Keluarga	1) Prevention of financial a consumption crisis after death of family member. 2) Increase in asset base. 3) Effect on social network.	2	1) Use of payouts to bridge shortfall of funds for living expenses. 2) Increase in asset base. 3) Gift giving by the social network.	441	3	Applies a sociological research framework.	1) Little was spent on supporting living expenses, but rather for social purposes; this is attributed to the strong economic position of the beneficiary (main breadwinner). 2) Little increase of asset base, rather crowding out of traditional support mechanisms. 3) Reduced gift giving; author sees potentially negative implications for social cohesion in medim run.	Exploratory qualitative research coomposed of group discussions before and after the introduction of the insurance were conducted. Furthermore, in depth interviews with beneficiaries. Further interviews were conducted with loan officers, MFI managers, group leaders and experts. Control group of uninsured missing. Selection bias.
Health insurance											
Rao, Waters, Steinhardt et al.	2009	Afghanistan	Community Health Insurance in Parwan, Saripul, (Wardak, Nimroz)	A) Financial protection b) Health care utilization	1, 3	1) Reduction in out of pocket spending. 2) Share of outpatient curative visits at a given facility compared to share in target population.	320	3	Descriptive	1) no effect of insurance. 2) Insured use more than uninsured (however, selection bias might be prevalent).	Apart from facility health data, a baseline survey and in two districts an endline survey (2 years after baseline) were conducted. Many of the insured fell into the poorest segment of the population and were enrolled for free. The study did not control for self-selection bias. The parallel introduction of user fees blurred the effect of the insurance. Sample size was small, reducing robustness of results.

Polonsky, Balabanova, McPake, Poletti et.al	2009	Armenia	Oxfam's CHI schemes ini Vayots Dzor district	Equity in access to health care	1	A1) Probability of consulting health post in villages with and without a scheme A2) Odds of visiting a HP at least once during the recall period	506	3	Regression	A1) 58% of primary respondents in scheme villages compared with 35% in non scheme villages used health post in last one month. A2) 77% of members reported visiting a health post at least once in the past 3 months compared with 36% among non-members. Members visited health posts at over 3.5 times the rate of non-members.	Indication of adverse selection or moral hazard (members report 2.8 times more illness episodes) point to self-selection bias. The results show higher utilization of members, and partly an equity effect, but the validity is reduced due to self-selection bias.
Gnawali, Pokhrel, Sié et al	2008	Burkina Faso	Nouna health district	Utilization of health care services	1	A) Health provider utilization during illness episode B) Outpatient visits defined as the total number of visits by sick households to a health facility during the recall period C) Inpatient care defined as any hospitalization for at least one day during one month recall period.	1309	2	Propensity score matching	A) 37% of insured compared to 12% of uninsured individuals. B) Visits of insured group was 40 percentage point higher than the uninsured group; significant overall. But when decomposed in quartiles, only significant for richest quartile. C) Increased by about 2-percentage point among the insured compared to the uninsured group, but not significant.	A cluster randomization approach, in which propensity score matching was applied to reduce self-selection bias.
Shepard, Vian and Kleinau	1996	Dem. Rep Congo	Bokoro Health Zone	Utilization of health care services	2, 3	use of new ambulatory services	47	3	Descriptive	insured 5 times as many new ambulatory services	Strong presence of self-selection bias in the study is likely, leading to overestimation of results.
Shepard, Vian and Kleinau	1996	Dem. Rep Congo	Bwamanda Health Zone	Utilization of health care services	2, 3	no of hospitalization	50	3	Descriptive	insured 6.7 time more likely to be hospitalized	Strong presence of self-selection bias in the study is likely, leading to overestimation of results.

Criel and Kegels	1997	Dem. Rep Congo	Bwamanda hospital insurance scheme	Access to care	3	Hospital admission rates	7362	3	Descriptive	A1) 1986: Rates for insured and non-insured were 36.2 and 24.8 per thousand. A2) 1988: Rates were 35.6 and 24.6 per thousand, respectively, highly significant. A3) 1993-1994: Rates of 49 and 24.9 per thousand, respectively.	Moral hazard could explain part of admission rates. However, co-pay and referral system reduced this. Adverse selection more likely to be a confounding effect.
Criel, van der Stuyft, van Lerberghe	1999	Dem. Rep Congo	Bwamanda hospital insurance scheme	Hospital utilization patterns	3	1) Admission rate per thousand split by different services 2) Coefficients of localization and location quotients which provide a measure of the spatial concentration of hospital utilization. 3) Average length of stay in a 4-month period. 4) Adequacy of bed occupation	1-2) 5,823 3) 1,585 4) 170	3	Descriptive	1) Higher admission rates for insured (2.9 times higher overall), not homogeneously distributed over various treatments 2) More equal spatial distribution (reducing effect of distance on seeking care) 4) No significant difference (Wilcoxon rank sum test, ns) 5) Bed occupations deemed not appropriate in many cases, both for insured and uninsured	Data indicated that lowest and highest quintile affiliate less with insurance; indication of bias in sample.
Shepard, Vian and Kleinau	1996	Dem. Rep Congo	Caisse de Solidarite Ouvriere et Paysanne (CASOP)	Utilization of health care services	2, 3	consultation visits per episode	126	3	Descriptive	insured 25% more consultation visits per episode	Strong presence of self-selection bias in the study is likely, leading to overestimation of results.
Noterman, Criel, Kegels and Isu	1995	Dem. Rep Congo	Masisi health insurance scheme	Access to care	3	Hospital admission rates	n.g.	3	Descriptive	Increased admission rates during operation of insurance schemes, with higher rates for members compared with non-members; those living close to the health facility benefit most. Strong indications of adverse selection and more hazard. The first one reduced when household subscription was introduced.	The study uses administrative data to retrospectively assess differences in utilization between cohorts. Adverse selection is one explaining factor for the differences; it is less so once the scheme was modified to household subscription. Utilization of services differs and is higher for people living close to the provider.

Criel	1998	Dem. Rep Congo	Masisi health insurance scheme	1) Access to care 2) Institutional deliveries	3	1) Hospital utilization/admission rates 2) No of institutional deliveries	n.g.	3	Descriptive	1) 157 per thousand with insurance compared to 46 per thousand not members of the scheme. 2) Higher number of institutional deliveries among insured.	Impact assessed based on hospitals' administrative data. In Masisi, information from three health centers not having insurance is used as control group as well. The schemes are exposed to some degree of adverse selection, biasing the results of the study.
Shepard, Vian and Kleinau	1996	Dem. Rep Congo	St. Alphonse	Utilization of health care services	2, 3	no of previous consultation visits for current episode	79	3	Descriptive	insured more previous consultation visits for current episode	Strong presence of self-selection bias in the study is likely, leading to overestimation of results.
Smith and Sulzbach	2008	Ghana	Nkoranza Health Insurance Scheme	1) Use of formal sector maternal health care 2) Reduce financial barriers to care	3	1) Delivery at a modern health facility (binary variable) 2) OOP expenditure for delivery care (among women who delivered at a health facility)-log values used for regression	293	3	Regression	1) not significant 2) beta -13.309	
Chankova, Sulzbach, Diop	2008	Ghana	Nkoranza Health Insurance Scheme	A) Use of health services B) OOPS for OP and IP care	1	A1) use of modern provider (binary variable) A2) hospitalized in last one/two year(s) (binary variable) B) Reported OOPS for outpatient and inpatient care (log value used in regression)	1806	3	Regression	A1) odds ratio 1.81 A2) not significant B) beta -9.44 for inpatient; outpatient not significant	Study included investigation of determinants for affiliation and found differences; comparability of cohorts reduced. Although, study tried controlling for endogeneity of effects doubts of bias e.g. through better availability of care in locations with insurance remain.
Diop, Sulzbach and Chankova	2006	Ghana	Nkoranza Health Insurance Scheme	A) Use of maternal health care services	1	A1) Use of prenatal care services A2) Use of modern facility for delivery	1806	3	Regression	A1) Odds ratio: 2.41 A2) Odds ratio: 1.98	Study included investigation of determinants for affiliation and found differences; comparability of cohorts reduced.

Devadasan, Manoharan, Menon, N et al.	2004	India	ACCORD community health insurance	Access to care	2, 3	Admission rates per thousand	450	3	Descriptive	Insured have 3 times higher admission rate; with shorter length of stay.	Potential for bias through adverse selection and moral hazard and selection bias among cohorts.
Devadasan, Criel et al	2007	India	ACCORD community health insurance	Protection from catastrophic health expenditure	3	1) Incidence of OOP payments 2) Catastrophic expenditure i.e. if a household expenditure for hospitalisation exceeded 10% of the total annual household income	683	3	Descriptive	1) 67% of insured households were protected from OOP payments 2) 8% of the households would have been catastrophically affected by admission costs if they were not insured; with insurance 3.5%	Reviewed insurance claims registers in both schemes and identified patients who were hospitalised during a one-year period. Details of their diagnoses, places and costs of treatments and self-reported annual incomes were obtained. Counterfactual constructed by assuming the absence of insurance for same patients. External validity doubtful though.
Dror et al	2009	India	BAIF	1) Utilization of care 2) Equity in access to care	1	1) Health care utilization 2) Concentration indices		3	Descriptive	1) Higher hospital utilization among insured. 2) More equal utilization among insured than uninsured.	Cohorts differ significantly; self-selection bias is not fixed.
Dror et al	2009	India	Nidan	1) Utilization of care 2) Equity in access to care	1	1) Health care utilization 2) Concentration indices		3	Descriptive	1) Higher hospital utilization among insured. 2) Uninsured have more equal access.	Cohorts differ significantly; self-selection bias is not fixed.
Gumber and Kulkarni	2000	India	SEWA	Total burden of health care expenditures under different insurance environments	1	1) Total costs of treatment per household (direct + indirect costs) 2) Burden of total healthcare costs (treatment + insurance premium) relative to income	1200 in total; 360 insured with SEWA, 360 control	3	Descriptive	A1) SEWA members have net total cost of treatment (Rs 4323) compared to non-insured (Rs.3502) A2) Burden of health costs relative to income: SEWA 21.4%; non-insured 19.9%	Survey comparing financial protection under different health insurance schemes; non-insured as control.

Gumber	2001	India	SEWA	A) Access to health care services B) OOP expenditure on treatment	1	A1) Probability of visiting a health care provider (binary variable) A2) Choice of private over public facility B) OOP expenditure incurred per episode for ambulatory and inpatient care (log values are used for regression)	60 per village and 90 per urban locality	3	Regression	A1) Odds of being untreated higher among insured with SEWA: 0.3669 A2) Members of SEWA tended to choose the private facility for ambulatory care (odds 2.1). No difference found in use for hospitalization. B) No significance for financial protection found.	
Ranson	2002	India	SEWA	Protection from hospitalisation costs	3	1) Total expenditure on hospitalisation sd % of annual HH income (for claims for which bills were available) 2) Catastrophic health spending (larger 10% of annual HH income)	1930 claims	3	Descriptive	1) The mean spent on hospitalisation (12.2% of annual household income) was significantly higher than the amount paid by 1632 claimants after they had received reimbursement (5.8% of income, significant) 2) Catastrophic costs incurred by 15.1% HH after reimbursement instead of 35.6% if there were no insurance. Reduction of catastrophic costs among the poorest was highest.	The study assess protection from catastrophic costs by reviewing claim data and comparing a hypothetical situation without reimbursement. This neglects the potential moral hazard as well as ignores non-submitted claims (e.g. because of missing documents) and might provide a biased assessment of the impact of insurance. In fact, number of claims is found much lower than expected hospitalization rates.
Devadasan, Criel et al	2007	India	SEWA	Protection from catastrophic health expenditure	3	1) Incidence of OOP payments 2) Catastrophic expenditure i.e. if a household expenditure for hospitalisation exceeded 10% of the total annual household income	3,152	3	Descriptive	1) 34% of insured were protected from OOP payments 2) 49% of the households would have been catastrophically affected by admission costs if they were not insured; with insurance 23%	Reviewed insurance claims registers in both schemes and identified patients who were hospitalised during a one-year period. Details of their diagnoses, places and costs of treatments and self-reported annual incomes were obtained. Counterfactual constructed by assuming the absence of insurance for same patients.
Dror et al	2009	India	Uplift Health	1) Utilization of care 2) Equity in access to care	1	1) Health care utilization 2) Concentration indices		3	Descriptive	1) Higher hospital utilization among insured. 2) More equal utilization among insured than uninsured.	Cohorts differ significantly; self-selection bias is not fixed.

Senchanthixay	2005	Lao	Community-based health insurance scheme	Access to care	3	A) Number of outpatient (OP) visits B) Number of inpatient (IP) admissions	n.g.	3	Descriptive	Sisattanak District (insured): A) OP visits increased by 52% while the average number of visits per patient rose by 40%. The increase in outpatient care is seen as shift of patients from low quality providers to the hospital's OPD. B) Number of IP visits decreased by 3.5% (taken as indication for treatment being sought earlier) Hadsaifong District (control): A) OP visits declined by 8.6% and the average number of visits per patient dropped by 7% B) IP visits rose by 26%	Information on health care alternatives is missing, making it impossible to assess whether non-insured went to other regions to pretend they are insured (which could explain increase in outpatient treatment one hospital and drop in other, which is not reflected in (more urgent) inpatient stays).
Franco, Diop, Burgert, Kelley et al.	2008	Mali	Bougoulaville, Wayerma, Kameni, Blaville	A) Utilization of priority health services B) Lower OOP for health services	1, 3	A1) Use of modern health services for curative (fever, diarrhoea) and maternal (prenatal, delivery) care (binary variable) A2) Use of preventative services provided free of charge by facilities (binary variable) B1) Overall annual household health expenditure (log-values) B2) Annual household health-care expenditure as a percentage of overall consumption (log-values) B3) Reported OOP payments for fever treatments, all and modern (log-values)	Member House holds: 817 Non-member house holds: 787	3	Regression	A1) Members were 1.7 times more likely to seek treatment for fever; 3 times more likely to seek modern/ORT for diarrhoea in their children; twice as likely to make at least 4 prenatal visits during pregnancy. No effect on institutional deliveries could be found. A2) MHO are a significant predictor of treated-mosquito-net use in both children and women during pregnancy. B1) no effect of insurance membership B2) MHO member associated with lower household health expenditure as a percentage of overall cash consumption B3) Lower OOP for fever treatments, particularly modern, among MHO members	Insured and uninsured groups differ in aspects of socio-economic and (self reported) health profile, raising the concern of a selection bias. The analysis is conducted over all four locations without controlling for location effects.

Chankova, Sulzbach, Diop	2008	Mali	Bougoulaville, Wayerma, Kameni, Blaville	A) Use of health services	1	1) use of modern provider (binary variable)	2659	3	Regression	1) odds ratio 1.48	Study included investigation of determinants for affiliation and found differences; comparability of cohorts reduced. Although, study tried controlling for endogeneity of effects doubts of bias e.g. through better availability of care in locations with insurance remain.
Smith and Sulzbach	2008	Mali	Bougoulaville, Wayerma, Kameni, Blaville	A) Use of formal sector maternal health care B) Reduce financial barriers to care	3	A1) Initiation of prenatal care within the first trimester of pregnancy (binary variable) A2) Four or more prenatal visits (binary variable) A3) Delivery at a modern health facility (binary variable) B) OOP expenditure for delivery care (among women who delivered at a health facility)-log values used for regression	775	3	Regression	A1) Odds ratio: 2.37 A2) Odds ratio: 2.41 A3) Odds ratio: 4.32 B) not significant	
Diop, Sulzbach and Chankova	2006	Mali	Bougoulaville, Wayerma, Kameni, Blaville	A) Use of maternal health care services	1	A1) Use of prenatal care services A2) Use of modern facility for delivery	2659	3	Regression	A1) Odds ratio: 2.09 A2) Not significant	Study included investigation of determinants for affiliation and found differences; comparability of cohorts reduced.

Dror, Soriano, Lorenzo et al	2005	Philippines	Guimaras Health Insurance Program; Davano City MMG CHP; Quezon City Novaliches NOVADECI-NHCP; VALDECO DPK; La Union OHPS; Bayawan Negros Oriental Peso for Health Program	Healthcare utilization	1	1) Primary care encounters 2) Hospitalizations 3) Professional attendance during deliveries 4) Delivery at home 5) Diagnosis of chronic diseases 6) Drug-incompliance among the chronically ill.	Insured: 890 Uninsured: 1063	3	Descriptive	Results presented as insured compared to uninsured: 1) 46.1% compared to 38.8% Difference statistically significant 2) 6.3% compared to 4.2%. Significant. 3) 54.5% compared to 44%. Significant. 4) 31.8% compared to 40.4%. Significant. 5) 5.7% compared to 4.6%. Significant. 6) 20.2% compared to 32.6%. Significant.	Cohorts partly contaminated; potential for sampling bias (differences in income and education).
Dror, Koren and Steinberg	2006	Philippines	Guimaras Health Insurance Program; Davano City MMG CHP; Quezon City Novaliches NOVADECI-NHCP;; La Union OHPS; Bayawan Negros Oriental Peso for Health Program	Equality of access to care	1	1) Incidence of hospitalization for different income groups; calculated as concentration index for the cohorts 2) Professional attendance at deliveries 3) Consultation with a doctor	Insured: 740 Uninsured: 804	3	Descriptive	1) Significant difference in CI between insured and uninsured for hospitalization 2) No differences between cohorts in accessing institutional deliveries 3) The difference on aggregated cohort level with insurance reducing inequality in access to consultations	Concentration curve and indices to examine income-related (in)equality in access to care. Cohorts partly contaminated; potential for sampling bias (differences in income and education); concentration indices are problematic if concentration curve flutters around equity line.

Kagubare	2005	Rwanda	52 Prepayment schemes in Byumba district (20), Kabgayi district (17), Kabutare district (15); 5 community mutuelles in Cyabinga, Janja, Mushaka, Muyumbu, Karengye	Health care utilization	3	Average use of curative consultation services by the population at the health center	n.g.	3	Regression	Average utilization rates of members 1.61; non members 0.4.	A retrospective longitudinal study with data from health centers conducted from 1998 to 2002. Results are biased by self-selection bias; degree cannot be estimated.
Schneider and Hanson	2005	Rwanda	54 micro health insurance schemes in Kabagayi, Byumba and Kabutare	A) Utilisation of services, also with regard to equity B) OOP payment for medical care	1	A1) Provider visit dummy (binary variable) A2) Concentration index A3) Utilization rates of people below the poverty line B1) Change in no of households below poverty line before and after treatment. B2) Depth of poverty measured by financing (poverty) gap; change of normalized poverty gap in %.	3139	3	Concentration index	A1) MHI members report significantly higher utilisation rates for actual (M) and need-adjusted visits (Mn) than user-fee individuals. A2) Health care utilization more equitable for insured (C: 0.079) compared to uninsured (C: 0.27). A3) Utilisation rates for individuals classified below the poverty line show that poor MHI members report significantly higher visit rates than the uninsured (0.43 vs 0.13 for outpatient; 0.37 vs 0.1 for inpatient). B1) Increase in number of households below poverty line due to treatment: 0.6% for insured, 1.3% for uninsured. B2) Increase of normalized poverty gap: 1.2% insured, 2% uninsured.	The data did not allow controlling for self-selection bias, reducing precision of the estimates.

Schneider and Diop	October 2001	Rwanda	54 micro health insurance schemes in Kabagayi, Byumba and Kabutare	A) Utilization of health care B) Use of maternal and child health services C) Health care expenditure	3	A1) Use of modern healthcare service A2) Probability of at least one professional provider visit (binary variable) B1) Use of prenatal care B2) Professional assistance during deliveries B3) Childhood immunization rates C) OOP per episode of illness (log-values used)	2518	3	Regression	A1) Insured report significantly better access with a visit probability of 0.45 compared to 0.15 (uninsured), significant. A2) Odd ratio: 6.59, significant. B1) Members slightly more likely (84.5 %) to have one prenatal visit compared to non-members (82.5%). B2) Members twice as likely to get assistance from a nurse (30%) than non-members (14.2%) B3) Same patterns between members and non-members. C) Poorest non-members pay almost 10 times more for an episode of illness than do PPS members in the same income quartile. PPS has significantly decreased OOP spending for the entire episode of illness for sick individuals who are members.	
Criel	1998	Rwanda	Bwamanda hospital insurance scheme	1) Access to care 2) Institutional deliveries	3	1) Hospital utilization/admission rates 2) No of institutional deliveries	n.g.	3	Descriptive	(see Criel, van der Stuyft, van Lerberghe 1999 for more details on results) 1) 1993/1994: 49 per thousand for insurance, 24.9 per thousand for people not insured in the scheme under scrutiny (but some in alternative scheme); increase in utilization higher in some departments; higher number of insured users compared to uninsured regardless of distance; however, distance decay stronger for insured group than uninsured. 2) 6.7 times more institutional deliveries among insured (27.6% and 4.1% per 100 expected deliveries insured/uninsured).	Impact assessed based on hospitals' administrative data. The schemes are exposed to some degree of adverse selection, biasing the results of the study. In Bwamanda, some employer based scheme is part of the control cohort, reducing the effect size of the insurance.

Diop, Schneider and Butera	2000	Rwanda	Byumba	Access to health care	3	1) Consultation rates between PPS members and non-members 2) Number of deliveries in the health centers 3) Number of prenatal consultations 4) Number of vaccinations	n.g.	3	Descriptive	1) Members 1.16 consultations/yr; non-members 0.15.2) Increased 40% after implementation of PPS. 1 out of every four women was a PPS member. 3) Increased by 27% after PPS implemented. 4) 56% increase.	The study uses five clusters to assess the impact of insurance; the number is too little for reliable information. Furthermore, data is incompletely reported, not revealing potential cofounding effects. The scheme is prone to adverse selection, biasing the results of the study.
Diop, Schneider and Butera	2000	Rwanda	Kabgayi	Access to health care	3	1) Consultation rates between PPS members and non-members 2) Number of deliveries in the health centers 3) Number of prenatal consultations 4) Number of vaccinations	n.g.	3	Descriptive	1) Members 1.52 consultations/yr; non-members 0.27. 2) Increased by 43%. 3) increased by 24%. 4) 46% increase.	The study uses five clusters to assess the impact of insurance; the number is too little for reliable information. Furthermore, data is incompletely reported, not revealing potential cofounding effects. The scheme is prone to adverse selection, biasing the results of the study.
Diop, Schneider and Butera	2000	Rwanda	Kabutare	Access to health care	3	1) Consultation rates between PPS members and non-members 2) Number of deliveries in the health centers 3) Number of prenatal consultations 4) Number of vaccinations	n.g.	3	Descriptive	1) Members 1.56 consultations/yr; non-members 0.30/yr. 2) Increased by 14%. 3) Increased by 5%. 4) 15% increase.	The study uses five clusters to assess the impact of insurance; the number is too little for reliable information. Furthermore, data is incompletely reported, not revealing potential cofounding effects. The scheme is prone to adverse selection, biasing the results of the study.
Criel	1998	Rwanda	Mutualite du Kanage (Murunda hospital insurance scheme)	1) Access to care	3	1) Hospital utilization/admission rates	n.g.	3	Descriptive	1) Insured members used the hospital dispensary 8.5 time more than non-members. Members used inpatient care 23.5 times more (admission rates 141 and 23.5 per thousand (insured/uninsured)).	Impact assessed based on hospitals' administrative data. The schemes are exposed to some degree of adverse selection, biasing the results of the study.
Diop, Sulzbach and Chankova	2006	Senegal	27 MHO in Thies region	Use of maternal health care services	1	1) Use of prenatal care services 2) Use of modern facility for delivery	1080	3	Regression	1) Not significant 2) Not significant	Study included investigation of determinants for affiliation and found differences; comparability of cohorts reduced.

Chankova, Sulzbach, Diop	2008	Senegal	27 MHO in Thies region	A) Use of health services B) OOPS for OP and IP care	1	A1) use of modern provider (binary variable) A2) hospitalized in last one/two year(s) (binary variable) B) Reported OOPS for outpatient and inpatient care (log value used in regression)	1080	3	Regression	A1) not significant A2) odds ratio 2.18 (when inpatient covered high) B) beta -1.81 for inpatient; outpatient not significant	Study included investigation of determinants for affiliation and found differences; comparability of cohorts reduced. Although, study tried controlling for endogeneity of effects doubts of bias e.g. through better availability of care in locations with insurance remain.
Jütting	2004	Senegal	Mutual of the Thies region: Fandène, Sanghé, Ngaye Ngaye, Mont Rolland	A) Health care utilization B) Financial protection	1	A) Probability of visiting a hospital B) OOP expenditure borne by the individuals	346	2	Regression	A) Members are 2% points more likely to go to a hospital, significant B) Members pay on average 50% less than non-members pay, significant.	Statistical methods are applied to control for endogeneity and self-selection bias. Low income segments of the population are less frequently insured.
Smith and Sulzbach	2008	Senegal	27 MHO in Thies region	A) Use of formal sector maternal health care B) Reduce financial barriers to care	3	A1) Initiation of prenatal care within the first trimester of pregnancy (binary variable) A2) Four or more prenatal visits (binary variable) A3) Delivery at a modern health facility (binary variable) B) OOP expenditure for delivery care (among women who delivered at a health facility)-log values used for regression	191	3	Regression	A1) not significant A2) not significant A3) Odds ratio: 4.74 B) beta -1.803	

Msuya, Jütting, Asfaw	2004	Tanzania	Community Health Fund: Igunga district	A) Demand for health care B) Financial protection	1	A) Use of curative health care services B) OOP expenditure for health care	200	3	Regression	A1) Only 4.5% of the insured members did not seek care when sick, compared to 30.6% of the non-members (same effect can be shown for poor households in both cohorts). A2) Sick or injured individuals in CHF members households were 15 percent more likely to get medical help compared to non-member households. B1) 5% of member households had to cover drug and examination costs by selling their own food compared to one quarter of non-member households. B2) Insured households apply less often welfare threatening methods for health care financing than uninsured; this counts also when comparing the poor households of both cohorts.		
Chee, Smith and Kapinga	2002	Tanzania	Community Health Fund: Hanang district	Health care utilization	3	Visits to health facility per year	n.g.	3	Descriptive	Insured members visit multiple times more often the facility than their share in the population	Differences in enrolled groups reduced comparability.	
Livestock												
Cai, Chen, Fang, Zhou	2009	China	Property and Casualty Company (Jinsha county)	How does access to insurance affect farmers' production decisions?	1, 3	Number of sows	n.g.	1	Regression	Villages with higher insurance penetration raised significantly more sows.	A randomized trial with time series data; control for confounding effects by using instrument variables.	

* 1= low, 2=moderate, 3=high