

# Access to Better Healthcare in Africa

New findings from research on PharmAccess  
Group supported programs





# Access to Better Healthcare in Africa

New findings from research on PharmAccess  
Group supported programs



Amsterdam Institute for Global Health and Development

**November 2017**



KKKTDAYOSISI YA KASKAZINI

HOSPITALI YA MARANGU

•MENO •DUKA •<sup>HUDUMA</sup>•UKUMBI •PHOTOCOPY  
•MACHO •AMBULANCE •CANTEEN •INTERNET

1 **MAPOKEZI**

2 **WAGONJWA  
WA NJE OPD**

3 **MALIPO**

- CASH  
OFFICE

4 **DIRISHA LA  
DAWA**

5 **MAPOKEZI YA  
DHARURA**

6 **ULTRASOUND  
CASUALITY**

7 **MAABARA**

8 **PALLIATIVE  
CARE**

9 **X-RAY**

10 **MORTUARY**

11 **CTC-ANGAZA  
ZAIDI (VCT)**

12 **MAMA NA  
MTOTO (RCH)**

13 **LAUNDRY**

14 **THEATRE**

15 **WALIOZIDIWA I.C.U.**

WODI ZILIZOPO:-  
16 **WODI  
YA UPASUAJI**

17 **WODI YA  
WAZAZI (OB)**

18 **WODI YA  
WAZAZI (OB)**

19 **WODI YA  
WANAUME**

20 **WODI YA  
WANAUME**





# Acknowledgements

*Joep Lange, the founder of PharmAccess, is widely acknowledged for pioneering HIV/AIDS treatment in Africa during the late 1990s. At that time, public funding was not yet available for HIV/AIDS treatment. Matters got worse when public funding began, as private payers and private healthcare providers could not access any donor money for HIV/AIDS treatment. Witnessing this crowding out effect, Onno Schellekens and Joep Lange started to work on a public funding concept for HIV/AIDS treatment that would also include private players. That initiative led to the founding of PharmAccess in 2000.*

*In 2006, Onno Schellekens and Sweder van Wijnbergen wrote an article that summarized their philosophy titled “On aid and AIDS in Africa”.<sup>1</sup> Topical concepts such as risk equalization, health insurance, matching demand and supply, investments, quality, and the role of trusted medical administrators were addressed. The Dutch Government was attracted by the new concept and decided to support PharmAccess through the Health Insurance Fund with a grant of 100 million Euros. With this support, PharmAccess was able to initiate, implement and operate functioning health insurance and delivery “labs” in Africa to test its interventions and business model. In the years since then, the systems have been strengthened and the results are becoming more evident. In 2007, the Amsterdam Institute of Global Health and Development (AIGHD) and the Amsterdam Institute of International Development (AIID) were assigned to carry out rigorous research to measure the impact of the interventions, starting with the demand side. The results of the research – conducted between 2009 and 2014 – are published in a report titled “The Impact of Access to Quality Healthcare in Africa”.*

*This report is a continuation of the previous version. Together, they form a compendium of the research conducted on the PharmAccess Group’s programs funded by the Dutch Ministry of Foreign Affairs. It highlights the impact that the analytical activities have had, and still have, on the culture of PharmAccess, the Health Insurance Fund enterprise, and their public and private partners in Africa. The PharmAccess Group has a culture of strengthening interactions between project implementation, evidence based analyses, and subsequent project improvements. Such a recurrent learning process ensures that we keep the ultimate goal clearly in sight, which is to provide affordable access to high quality healthcare for low-income households living in our target areas.*

*We would like to thank the authors of the various studies. We often quote them verbatim from the abstracts of their papers.*

*We would also like to thank the Dutch Ministry of Foreign Affairs, the boards, management and staff of the PharmAccess Group, AIGHD, the Joep Lange Institute and their local partners in Africa for their ongoing support.*

*Acknowledgements also to Daniella Brals for her contribution to Section 6 and Kwasi Boahene, Marijn van der List and Alexander Kohnstamm for their contributions, including Section 7. Special thanks to Tobias Rinke de Wit for his extensive comments on earlier versions.*

*Jacques van der Gaag & Alexander Boers*

*Amsterdam, November 2017*

---

<sup>1</sup> Schellekens, O. and Van Wijnbergen, S., (2006). *On aid and AIDS in Africa: Alleviating poverty through increasing access to healthcare and HIV/AIDS treatment in Sub-Saharan Africa.*

# Content

<b>Acknowledgements</b>	<b>3</b>
<b>1 Executive summary</b>	<b>7</b>
<b>2 Introduction</b>	<b>9</b>
<b>3 The impact on healthcare utilization and out-of-pocket spending</b>	<b>13</b>
3.1 The impact of subsidized private health insurance and health facility upgrades on healthcare utilization and spending in rural Nigeria	14
3.2 Effects of a subsidized voluntary health insurance on insured and uninsured in Nigeria	15
3.3 The effect of health insurance on the utilization of formal healthcare in rural Nigeria	15
3.4 Health shocks, coping strategies and foregone healthcare among agricultural households in Kenya	16
3.5 Healthcare initiatives in Nandi County: How do dairy farmers and their families make use of different healthcare initiatives, including The Community Healthcare Plan?	17
3.6 The financial burden of non-communicable chronic diseases in rural Nigeria: Wealth and gender heterogeneity in healthcare utilization and health expenditures	19
<b>4 The impact on health outcomes</b>	<b>20</b>
4.1 Sustained effect of health insurance and facility quality improvement on blood pressure in adults with hypertension in Nigeria: A population-based study	22
4.2 How group-based cardiovascular health education affects treatment adherence and blood pressure control among insured hypertensive Nigerians: A pre-test, post-test study	23
4.3 Enablers and barriers for implementing high-quality hypertension care in a rural primary care setting in Nigeria: Perspectives of primary care staff and health insurance managers	24
4.4 Costs and cost-effectiveness of hypertension screening and treatment in adults with hypertension in rural Nigeria in the context of a health insurance program	25

4.5	Development of a cardiovascular health education program for primary care patients with hypertension in rural Nigeria: A qualitative study	25
4.6	The effect of health insurance and health facility-upgrades on hospital deliveries in rural Nigeria: A controlled interrupted time-series study	26
4.7	Improving maternal care through a state-wide health insurance program: A cost and cost-effectiveness study in rural Nigeria	28
4.8	The impact of The Community Healthcare Plan, the National Health Insurance Fund, and the free maternal care program on maternal and child healthcare utilization in rural Kenya: A population-based study	29
4.9	Factors influencing decision for home- or facility-based delivery after implementation of Free Maternal Care in Nandi County, Kenya	31
4.10	Effect of health insurance and health facility improvements on birth weight and infant healthcare utilization in rural Nigeria	31
4.11	The effect of health insurance and healthcare facility-upgrades on nutritional status of children in rural Nigeria: A longitudinal study	32
<b>5</b>	<b>Special studies</b>	<b>33</b>
5.1	Evaluation of The Community Healthcare Plan in Nandi North, Kenya: Enrollment and dropout	33
5.2	Evaluation of HIF-supported Health Insurance Projects in Tanzania: Follow-up report on the KNCU Health Plan	34
5.3	The social dilemma of microinsurance: Free-riding in a framed field experiment	36
<b>6</b>	<b>Capacity building</b>	<b>38</b>
<b>7</b>	<b>Conclusion</b>	<b>40</b>
<b>8</b>	<b>Annex 1: List of reports and publications</b>	<b>44</b>







# 1 Executive summary

The introduction of subsidized health insurance, in conjunction with quality upgrades of participating clinics and hospitals, had the following consequences in various African populations (countries abbreviated in brackets<sup>2</sup>):

## Financial

1. The Kwara State health insurance program has demonstrated that State-based health insurance schemes can deliver a decent basic healthcare coverage at US \$28 per person per year compared to WHO benchmark of US \$60 and Nigeria's total health expenditure per capita of US \$115. (N)
2. Large increases in healthcare consumption with temporary reduction of out-of-pocket expenditures. The out-of-pocket expenditures were back at original levels, while healthcare consumption had doubled. (N)
3. For the non-insured (majority population): increased out-of-pocket expenditures. There was also some evidence of reduced formal healthcare consumption and increased informal healthcare consumption (possible crowding out of the non-insured). (N)
4. For both insured and non-insured: drugs remain mostly purchased through out-of-pocket expenditures. (N)
5. Households experience regular financial shocks; not only health shocks but also other shocks (agricultural, etc.), which should be taken into consideration when insuring them. (K)
6. Most people prefer group insurances above individual insurance arrangements. (T)

## Medical

7. Hypertension can be significantly reduced in the insured population. (N)
8. Cardiovascular health education programs in the context of health insurance have positive effects on blood pressure. (N)
9. Primary care staff and health insurance managers perceive health insurance as a positive intervention for chronic hypertension management. (N)
10. Hypertension care may be cost-effective in the context of insurance. (N)
11. Health insurance combined with quality healthcare services is highly effective in increasing hospital deliveries; non-insured women also benefit from improved quality; distance to facilities is an important independent determinant of success. (N)

---

<sup>2</sup> N=Nigeria; T=Tanzania; K=Kenya

12. Insurance is associated with a significantly higher birth weight of 0.215kg. In addition, insured infants in the program area have higher healthcare utilization. (N)
13. Health insurance and utilization of improved healthcare are effective strategies to improve the nutritional status of malnourished children. (N)
14. Local (private) health insurance initiatives require well-organized information campaigns to become known to the population. (K)

### **General**

15. The introduction of the intervention in an environment with competing program and rapidly changing policies poses major challenges. (K,T)
16. Interaction between (impact) research and implementation can significantly contribute to the success of the program. The implementation should always be leading. (N,K,T)
17. Solid public private partnerships contribute to the success of the program. When donors are involved, they need a clear exit strategy. (N,K,T)
18. The introduction of health insurance is more than a money issue. It calls for large investments in data collection, which leads to transparency and accountability. It also introduces modern (private sector) management practices. (N,K,T)
19. Impact evaluation is costly and time consuming. The use of mobile technology, such as currently introduced in Kenya (see reference to M-Tiba, footnote 23), can greatly contribute to reduce these costs and provide data in real time.

## 2 Introduction

In October 2006, the Health Insurance Fund was founded with a generous grant from the Dutch Ministry of Foreign Affairs. The fund supports an innovative approach to promote access to better healthcare for low-income people in sub-Saharan Africa. The Health Insurance Fund uses its resources to fund the healthcare activities of the PharmAccess Group. PharmAccess, a Dutch NGO, was founded in 2000. The origin of PharmAccess lies in the field of HIV/AIDS and the mother to child transmission studies which were conducted in the mid-1990s. Since those studies, PharmAccess has been active in healthcare in sub-Saharan Africa by pioneering large scale HIV/AIDS treatment programs that provided anti-retroviral drugs to people with HIV/AIDS. Through activism, scientific research on triple combination therapy, and collaboration with the private sector, PharmAccess demonstrated how more resources, efficiency and effectiveness could be introduced in the healthcare system of sub-Saharan Africa.<sup>3</sup> In the early 2000s, PharmAccess set up a Risk Equalization Fund for HIV to encourage health insurance companies to offer health insurance to people with HIV in Namibia.<sup>4,5</sup>

PharmAccess has evolved into an organization that focuses on improving general access to quality healthcare. With the resources of the Health Insurance Fund (supported by the Dutch Ministry of Foreign Affairs), PharmAccess has been increasingly successful in forming solid local public private partnerships to address the health needs of the low-income people in sub-Saharan Africa. These activities included the development and implementation of subsidized health insurance products to realize more equitable access to healthcare in Africa. In addition, participating public and private healthcare facilities were upgraded to acceptable quality levels. Health Insurance Fund-funded projects were implemented in Nigeria, Kenya, and Tanzania.

Nowadays, the unparalleled opportunities that newly emerging technologies (such as mobile telecommunication) on the continent provide for the financing and delivery of healthcare will be central to PharmAccess's approach for the coming years. These opportunities offer the potential to fundamentally transform the healthcare markets for patients, healthcare provider and payers (e.g., people, governments, donors and investors).

---

3 Schellekens, O. et al. (2007) 'A New Paradigm for Increased Access to Health Care in Africa'

4 Schellekens, O. and Van Wijnbergen, S., (2006). *On aid and AIDS in Africa: Alleviating poverty through increasing access to healthcare and HIV/AIDS treatment in Sub-Saharan Africa*.

5 Onno Schellekens, Ingrid de Beer, Marianne E. Linder, Michelle van Vugt, Peter Schellekens and Tobias Rinke de Wit (2009). The Innovation in Namibia: preserving the private health insurance and HIV/AIDS treatment. *Market Watch* 28 (6) pages 1799-1806.



The strategic objectives – as set out in the Health Insurance Fund/PharmAccess Strategic Funding Proposal 2016-2022 – are:

1. Develop private pre-payment mechanisms, risk pooling structures, and mobilize resources for organized demand.
2. Strengthen, benchmark, and certify clinical and business performance of healthcare service suppliers.
3. Improve efficiency, effectiveness, and transparency to better match demand and supply of healthcare transactions.
4. Mobilize capital into the private health sector.
5. Conduct research on the various implemented strategic interventions and advocate those that are successful.

As emphasized in Objective 5, research and proof of principle has always been an integral part of PharmAccess's approach. The projects funded by the Health Insurance Fund are rigorously evaluated in terms of their impact on the target population.<sup>6</sup> The Amsterdam Institute for Global Health and Development (AIGHD) and the Amsterdam Institute for International Development (AIID) were contracted to conduct these evaluations during the first funding period.

In February 2015, AIGHD published a report titled “The Impact of Access to Quality Healthcare in Africa”.<sup>7</sup> This report summarized the results of a large number of studies (mostly impact evaluations) conducted in the period 2009-2014. This current report is a continuation of the first one. It provides summaries of studies conducted from 2014 through August 2017.

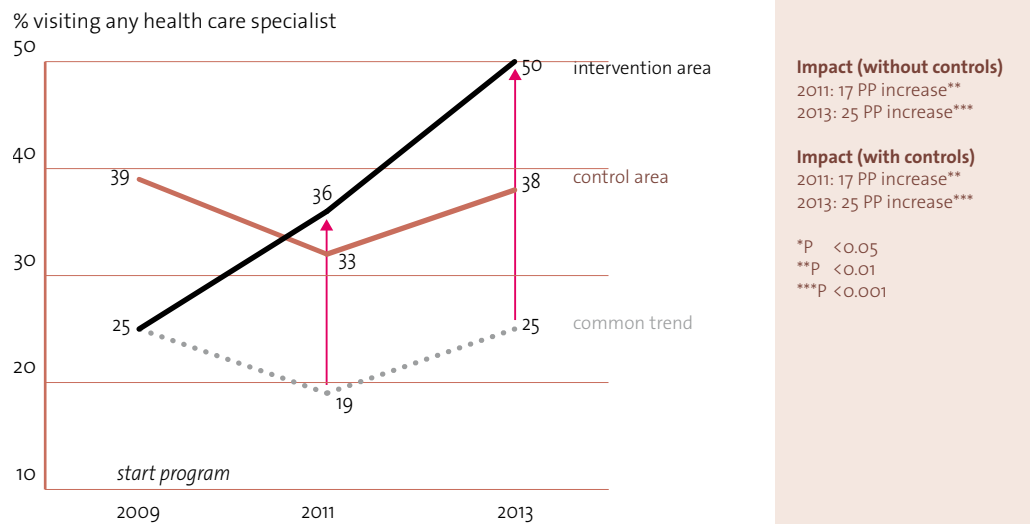
As stated above, the main focus of this collection of studies was on measuring the impact of the healthcare interventions. At the beginning of this century, rigorous impact evaluations had become a regular tool in the developing world to determine the effectiveness of development projects. The adjective “rigorous” refers to the objective to measure “causal” impact, rather than providing just before and after descriptions of the situation (in this case regarding healthcare consumption) in the areas where the projects had been implemented. To determine causal relationships, data had to be collected on both the treatment area (where the project was being implemented) and a comparable control area (where the project was not available). The methodology is explained in more detail in the first report<sup>8</sup>, but Figure 1 provides a quick illustration of the process.

---

<sup>6</sup> In fact, the HIF financed projects were the first Dutch sponsored development projects that included “built-in” rigorous evaluation components.

<sup>7,8</sup> The Impact of Quality Healthcare in Africa: research findings on Health Insurance Fund-supported programs, AIGHD, February 2015.

Figure 1: Percentage visiting any healthcare provider



The figure, using data from Kwara State, Nigeria, shows that at the time of the baseline survey (2009, prior to project implementation), 25 percent of the population in the treatment (or intervention) area (black line) and 39 percent of the population in the control area (brown line) had used medical care at least once in the previous year. Two years after the start of the project, access had increased to 36 percent in the treatment area, and had actually decreased to 33 percent in the control area. If developments in the treatment area would have been the same as in the control area<sup>9</sup>, access would have declined to 19% (dotted line). The difference between 19 percent hypothetical access and 36 percent actual access is called the (causal) impact of the project. Two years later, researchers see that in the treatment area, access had increased to 50 percent, double the access that would have been the case without the intervention.

The vast majority of the studies referred to in this and the previous report follow this methodology.<sup>10</sup> While the studies summarized in the first report mainly focused on access (both physical and financial), this report includes a large number of studies on selected health outcomes. But first, in Section 3, follow-up studies of the impact on access evaluations will be presented. The first study summarized is a continuation of the Kwara study, pictured above. The continuation included numerous checks, such as alternative model specifications and estimation methods, to determine whether the first results were robust. The study shows that indeed they are: the project in Kwara State has been highly successful in increasing access to affordable access to quality healthcare. These results hold for various population groups, such as young and old, rural and urban and rich and poor.<sup>11</sup> The other five studies in this section

<sup>9</sup> This is the critical assumption in this line of research. It is called the "common trend" hypothesis.

<sup>10</sup> Though other techniques are used too, notably propensity score matching (PSM).

<sup>11</sup> More precisely, those below and those above the medium income, which was about \$1.50 per day at the time of the surveys.

look at various other aspects of the intervention in Kwara State and Kenya, such as the impact of the project on people who decided not to participate in the insurance scheme, and the impact on the use of pharmaceuticals.

Section 4 provides summaries of eleven studies that look at the impact on selected health outcomes. These include cardiovascular health (including hypertension) and mother and child health (including nutritional status). Earlier studies had shown that self-reported health had actually gone down in the treatment area, which, of course, was due to the fact that, with access, people become more aware of their own health problems (e.g., hypertension, which is non-symptomatic). All the new studies show a positive impact on people's health, as measured by objective (bio-medical) health indicators. The overall impression is that the type of integrated healthcare provision, as a result of the project interventions, can be successful in addressing specific diseases. Vertical programs (focusing on specific diseases such as hypertension of Maternal and Child Health) can use the insurance component of the intervention to become integrated in the overall package.

Section 5 provides summaries of selected special studies, mostly from Kenya and Tanzania. The first study describes the Tanykina Community Healthcare Plan that was introduced in rural Kenya in 2013. It has a quantitative and qualitative component and the focus is on enrollment and dropout. The second study describes the Kilimanjaro Native Cooperative Union (KNCU) Health Plan implemented in the Kilimanjaro region in Tanzania. It also describes how this program was joined with the Community Health Funds – a publicly available community based insurance scheme managed by the district governments – to increase sustainability. The report is purely descriptive and based on the second round household survey conducted in March 2015.

The third paper reports on field experiments with credit groups in Tanzania, to better understand the preferences for group insurance versus individual insurance.

Section 6 describes another aspect of the “built-in” research component: research capacity building among the country level counterparts of the mostly Amsterdam-based researchers.

Section 7 draws some general lessons from this large body of work, and concludes.<sup>12</sup>

---

<sup>12</sup> Note to reader

Sections 3, 4 and 5 consist of short abstracts of all articles and reports that form part of this report. These abstracts are often taken directly from the published article. A full list of articles and reports produced by AIID and AIGHD relating to Health Insurance Fund-supported programs, with full titles and all authors, can be found in Annex 1. Copies of articles and reports can be obtained (if property rights allow) by sending a request to Alexander Boers (a.boers@aighd.org), or by accessing the respective journals. Papers listed as “under review” may not yet be available for distribution.



### 3 The impact on healthcare utilization and out-of-pocket spending

The first study summarized here (section 3.1) is a continuation of the impact evaluation of the Kwara State Health Insurance (KSHI) program, covering the period 2009-2013. It uses alternative model specifications and various additional estimation methods to test the robustness of the previous results. All results hold up well to those numerous tests: access increased (indeed it almost doubled). Out-of-pocket payments decreased after two years, but moved back up during the next two years, in parallel with the continuing increase in healthcare consumption. The results are remarkably equal over different population groups, such as men and women, old and young, urban and rural, and rich and poor.

The next two studies continue to focus on access and utilization, but with a slightly different emphasis. Study 3.2 looks at the effect on the intervention of the insured and the uninsured and finds evidence of some crowding out of those who decide not to take up the insurance. The study concludes with a call for more research to understand better what is behind this crowding-out mechanism. The next study looks at drug consumption and finds that the vast majority of the population makes use of the non-formal healthcare sector for obtaining their prescription drugs. The numbers are very high for the non-insured (89.4%), but still more than half (57.8%) for the insured. More attention to the non-formal part of the healthcare sector seems to be warranted.

The next study, (3.4, using data from Kenya) looks at health shocks and mechanisms to cope with these shocks. Health shocks pose a significant risk to households and can lead to catastrophic healthcare expenditures. Pre-payment mechanisms such as health savings or health insurance can mitigate these shocks. But poor rural households also experience non-health shocks (such as droughts), which compete for scarce resources with health shocks.

Most of the studies have used data from the KSHI program in Nigeria. The rural areas in Kwara are homogeneous and healthcare is scarce, if available at all. In Nandi County, Kenya, the situation is different. Multiple programs and healthcare finance mechanisms exist side by side, something that needs to be taken into account when designing a private health insurance intervention such as the Community Health Care Plan. The study summarized in 3.5 makes an inventory of these competing (and sometimes overlapping) initiatives in the County.

The final study, 3.6 looks at the merits of, and preferences for and against, group insurance *vis a vis* individual insurance. Using a framed field experiment with credit groups in Tanzania the study finds that the demand for group insurance is high, but also that a substantial number of individuals prefers to rely on peers to help cope with financial shock due to ill health, through gifts and loans.

### 3.1 The impact of subsidized private health insurance and health facility upgrades on healthcare utilization and spending in rural Nigeria

This paper analyzes the quantitative impact of an intervention that provides subsidized low-cost private health insurance together with health facility upgrades in Kwara State, Nigeria. The evaluation, which measures impact on healthcare utilization and spending, is based on a quasi-experimental design and utilizes three population-based household surveys over a four-year period. After four years the intervention increased overall healthcare use by 25.2 percentage points in the treatment area (thereby doubling access) and by 17.7 percentage points among the insured. Utilization of modern healthcare facilities increased after four years by 20.4 percentage points in the treatment area and by 18.4 percentage points among the insured due to the intervention. After two years of program implementation, the intervention reduced healthcare spending by 51 percent compared with baseline, while after four years, spending resumed to pre-intervention levels, however, with a doubled consumption.

*Table 1: Primary and Secondary Care Services Covered by Kwara State Health Insurance*

- Inpatient care
- Outpatient care
- Hospital care and admissions (unlimited number)
- Specialist consultation
- Provision of prescribed drugs and pharmaceutical care
- Laboratory investigations and diagnostic tests
- Radiological investigations
- Screening for and treatment of most diseases\*
- Minor and intermediate surgeries
- Antenatal care and delivery
- Neonatal care
- Preventive care including immunization
- Eye examination and care
- Screening for and treatment of sexually transmitted diseases
- Annual check-ups
- Health education

*This table shows the comprehensive health insurance package that was part of the KSHI program*

### **3.2 Effects of a subsidized voluntary health insurance on insured and uninsured in Nigeria**

Interventions aiming to simultaneously improve financial protection and quality of care might provide an important avenue towards universal health coverage (UHC). In this study the author exploits panel data collected in 2009 and 2011 among 3,509 randomly selected respondents in Kwara, Nigeria, to estimate the effects of the Kwara State Health Insurance program on both the insured and uninsured. Within this program a subsidized voluntary low cost health insurance was offered by a private insurer and activities were undertaken to upgrade quality in selected healthcare facilities. Using propensity score matching the author finds that for the insured the program increased healthcare utilization and reduced out-of-pocket (OOP) expenditure. These improvements seem largely driven by the insurance. However, among the uninsured in the area with upgraded facilities, formal healthcare utilization decreased, informal healthcare utilization increased and OOP expenditures went up. These results suggest crowding-out of the uninsured from formal care facilities, which is problematic given that 67 percent of the sample did not take up the insurance in the initial two years of implementation. The author concludes that implementing voluntary health insurance as a means towards UHC, warrants careful design of simultaneous supply side interventions to limit potential negative effects on those who do not enroll in the insurance. Further research is necessary to identify the processes driving the crowding-out of the uninsured.

### **3.3 The effect of health insurance on the utilization of formal healthcare in rural Nigeria**

Incorrect drug use practices are widespread in Nigeria. To improve access to affordable and quality healthcare, the Health Insurance Fund, PharmAccess, Hygeia Community Health Care and the Kwara State Government developed the Kwara State Health Insurance (KSHI) program for the population of rural Kwara State, Nigeria. The KSHI program was implemented in rural central Kwara State in 2009 and provides subsidized low-cost private health insurance and improvements of the quality of available healthcare facilities.

In this study, the author aims to determine differences in drug use practices between a setting in which an insurance program is operational and a setting in which it is not, by investigating whether there is an association between enrollment in the KSHI program and utilization of the formal healthcare sector for obtaining prescription drugs.

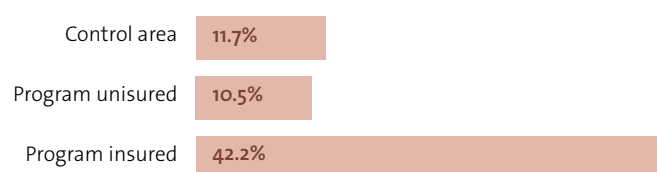
Data were obtained through household surveys that were carried out in 2009, 2011 and 2013 and were analyzed using descriptive statistics and regression analyses. To control for (unobserved) sources of selection bias, the instrumental variables (IV) method was used.



The author found a significant difference in utilization of formal healthcare between non-insured and insured people (non-insured people: 10.5%, insured people: 42.2%, OLS/logistic regression:  $p < 0.001$ , IV regression:  $p = 0.036$ ). Presence of a chronic disease and use of alcohol influenced the relationship between insurance status and utilization of formal healthcare ( $p < 0.001$ ,  $p < 0.001$ ).

Being insured was associated with higher utilization of formal healthcare for obtaining prescription drugs. However, the largest part of the population (89.5% of the non-insured people and 57.8% of the insured people) still used the non-formal healthcare sector for obtaining their prescription drugs. This may be caused by several factors, including the fact that health behavior changes are a gradual, long-lasting process.

*Figure 2: Percentage formal provider for prescription drugs*

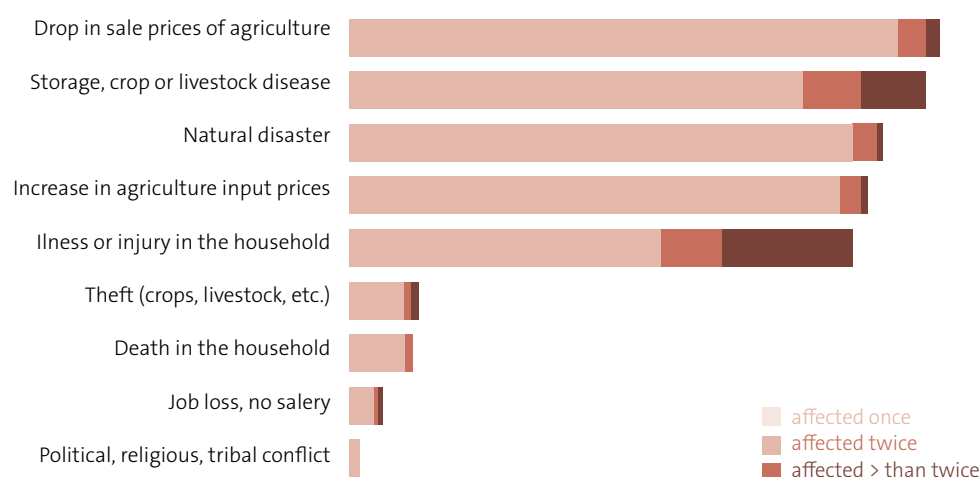


*This figure shows what percentage of prescription drugs are obtained from formal providers in the control and intervention areas, and differentiated between insured and uninsured in the intervention area*

### 3.4 Health shocks, coping strategies and foregone healthcare among agricultural households in Kenya

Risks are a central part of life for households in low-income countries and health shocks in particular are associated with poverty. Formal mechanisms protecting households against the financial consequences of shocks are largely absent, especially among poor rural households. The researchers' aim is to identify the relative importance of health shocks and to explore factors associated with coping behavior and foregone care. This study uses a cross-sectional survey among 1,226 randomly selected agricultural households in Kenya. In this sample, illness and injury shocks dominate all other shocks in prevalence. Almost 2% of households incurred catastrophic health expenditure in the last year. Using a probit model the study identified the main coping strategies associated with facing a health shock: (1) use savings, (2) sell assets and (3) ask for gifts or loans. One in five households forewent necessary care in the last 12 months. The researchers conclude that health shocks pose a significant risk to households. Implementing pre-payment or saving mechanisms might help protect households against the financial consequences of ill health. Such mechanisms, however, should take into account the competing shocks that agricultural households face, making it almost impossible to reserve a share of their limited resources for the protection against health shocks only.

Figure 3: Coping strategies of households when faced with different types of shocks



This figure shows the numerous shocks rural dwellers in Kenya suffer from

### 3.5 Healthcare initiatives in Nandi County: How do dairy farmers and their families make use of different healthcare initiatives, including The Community Healthcare Plan?

The Community Healthcare Plan (TCHP) started as an insurance program targeting dairy farmers who were members of Tanykina Dairy Ltd in Nandi County, Kenya. The insurance scheme included a demand side (a comprehensive insurance package) and a supply side (quality upgrades of participating facilities). Other healthcare programs and policies were active in the area. This report addresses the following research question: “Which healthcare initiatives are active in Nandi County, how did these develop over the years, and how do the members of the dairy companies and their families make use of these different initiatives?” The underlying motivation is that the existence of many other healthcare initiatives may have had an effect on the TCHP program (The Community Healthcare Plan) and its relatively low enrollment figure. The study is based on data from financial and health diaries, qualitative research, and a baseline and follow-up survey in 2011 and 2014 respectively, all conducted in Nandi County among dairy farmers affiliated with the Tanykina Dairies Ltd (TCHP intervention area) and Leleben Dairies Ltd (control area).

The research found several healthcare initiatives in the area that might have interfered with TCHP. Some had been around for a long time, some only introduced after the commencement of TCHP. Free Primary Care (FPC) is similar to the basic package of TCHP, however, TCHP also offers private and mission facility services. The National Hospital Insurance Fund (NHIF) is cheaper than TCHP, though to date its cover is more limited. Furthermore, there is an overlap in the provision of maternal care: NHIF has a maternal package, the government offers Free Maternal Care (FMC) in all public facilities, and TCHP includes maternity services in its two packages

(though these services are rarely used). Changes are also ongoing, such as that FMC will likely be channeled through NHIF, and NHIF promises to soon offer an outpatient package to all Kenyans.

The most common chronic diseases experienced by individuals in both the intervention and control area were hypertension, pain in limbs, allergy, and asthma. Hospitalizations did not occur often, but significantly more in the intervention area. The main reasons for hospitalization were malaria and childbirth. The insured had significantly more health events than the uninsured. People saw cancer as a threat, while not many actually reported suffering from this disease. Almost no screening and treatment was available in the area.

People preferred to visit the nearest facility first and, if the condition was serious, they were referred to the larger hospitals to receive treatment for their condition. Distance was more important in dictating which facility was visited in the case of acute illnesses and injuries than in the case of chronic diseases. The main reported reasons for choosing a certain healthcare provider were availability of drugs and lab tests. The main difference between the intervention and control area was that the individuals in the intervention area more frequently visited mission facilities, while the control area more often visited public facilities. Individuals enrolled in TCHP visited private/mission TCHP facilities significantly more compared to those not enrolled in TCHP. The uninsured visited public non-TCHP facilities significantly more often. Finally, and perhaps unexpectedly, even the TCHP-insured visited non-TCHP facilities more often than TCHP facilities. The percentage of health events resulting in consultations decreased throughout the year. The reason for this decrease requires further investigation.

Although public facilities (the health centers and dispensaries) should provide free basic healthcare, drugs were often not available. In private and mission facilities people could make payment arrangements and sometimes certain parts of the fees were waived. Households in the intervention area that ever enrolled in TCHP had higher healthcare expenditures at baseline. Healthcare expenditure of the households that never enrolled in TCHP increased from baseline to follow-up, while it remained more or less the same for the TCHP-insured. Highest healthcare expenditures were spent on hospitalizations. Hospitalizations were mainly paid for by patients themselves and in some cases by NHIF. The government paid for acute illnesses or injuries most often, according to respondents in the survey. This is probably done through the newly introduced FPC or through programs financed by the government (e.g., immunizations).

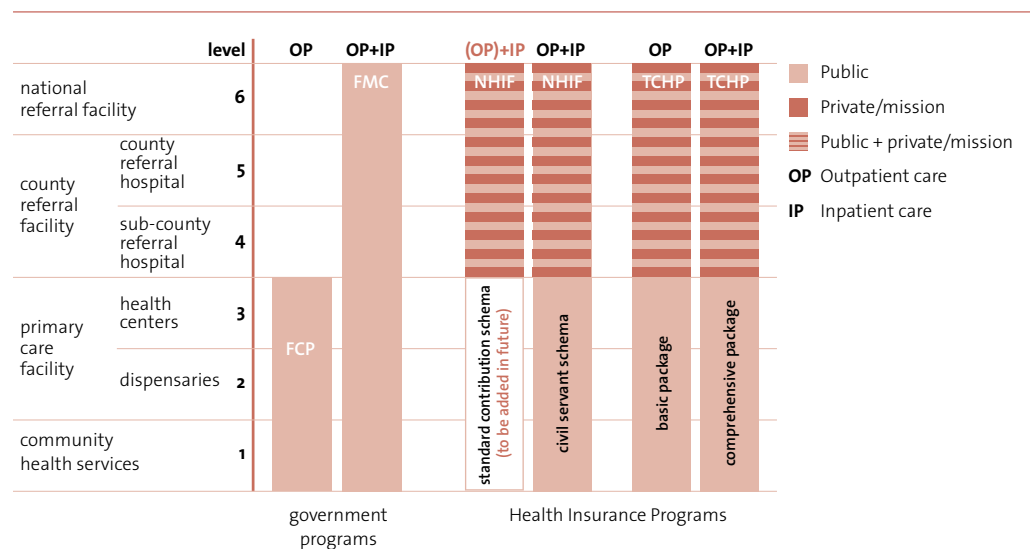
The TCHP-insured spent more in TCHP facilities than in non-TCHP facilities (both per visit and in total annually). The TCHP-uninsured also spent more on TCHP facilities per visit, but they spent more on non-TCHP facilities in total because they go there more often. TCHP enrollees with the old package (before the introduction of a second, basic package in 2013) on average spent most in the mission TCHP facilities and they mainly drive the high average expenditures of the insured in TCHP facilities.



Transportation costs, and the share of travel in total costs, were higher for visits to modern facilities than to non-modern facilities, and were significantly higher for TCHP facilities as compared to non-TCHP facilities. Travel costs were also higher for hospitalizations.

To conclude, the introduction of TCHP has interfered with many other healthcare initiatives. Health seeking behavior can vary for different diseases. This study found that the TCHP- insured still spent money out-of-pocket at both TCHP and non-TCHP clinics and as a group specifically had higher healthcare expenditures at baseline.

Figure 4: Healthcare initiatives in Nandi County, Kenya



This figure provides an overview of the different healthcare initiatives (Free Maternal Care, Free Primary Care, the National Hospital Insurance Fund (NHIF) and TCHP) and what type of healthcare facilities can be accessed through these initiatives.

### 3.6 The financial burden of non-communicable chronic diseases in rural Nigeria: Wealth and gender heterogeneity in healthcare utilization and health expenditures

Health shocks are among the most important unprotected risks for microfinance clients, but take-up of micro health insurance remains low. A field experiment with credit groups in Tanzania, eliciting demand for group versus individual insurance, attributes this to a social dilemma. In a context of joint liability, insurance is a public good because clients can rely on contributions from group members to cope with health shocks. The authors hypothesize that clients have a private incentive to free-ride (gain an advantage without having to do anything to deserve it) and forgo individual insurance even when full enrollment optimizes group welfare. The binding nature of group insurance eliminates such free-riding. This study's experiment yields substantial support for this hypothesis. Whereas the demand for group insurance is high, a substantial share of clients forgoes individual insurance and relies on peers to repay their loan when falling ill. Group insurance can potentially increase low take-up rates.

## 4 The impact on health outcomes

The primary focus of the series of impact studies presented in Section 3 was on the question of access to affordable quality healthcare. As the report shows, the intervention was successful in providing people living in the treatment area, who prior to the intervention had enjoyed little access to medical care, with the access they needed. Of course, the ultimate objective of the intervention was to improve the health of the population. Establishing a causal link between the intervention and health outcomes is an order of magnitude more difficult than studying access *per se*, because “health status” has many dimensions. In some of the studies, self-reported health was used as a health status measure, and the results appeared to be somewhat contradictory: access to healthcare often has a negative effect on self-reported health outcomes. This is explained by the fact that access to healthcare improves people’s awareness of existing health conditions, especially conditions that are non-symptomatic (see below on hypertension).

In order to study the effect of a healthcare intervention that is general in character (rather than focused on a specific disease), one necessarily needs to be selective and pragmatic. Only the impact on diseases that have a relatively high prevalence, and that are easy to diagnose, can be studied based on relatively small samples of household data. Looking at the health situation in Africa, being selective is a tall order. Over the past couple of decades, great strides have been made in reducing the prevalence of communicable diseases, but the fight against such diseases is not over. To give just one example, large programs have been dedicated for decades against malaria, but about one million people in sub-Saharan Africa still die every year from the disease, and the number seems to be rising in recent years.

### Hypertension

While Africa is battling communicable diseases, non-communicable diseases are on the rise. Hypertension is one of those diseases. It also leads to cardiovascular diseases, which are the number 1 cause of death globally, and its prevalence is rising. For example, one meta-study for Africa shows that the prevalence of hypertension (which is non-symptomatic, but can lead to death if left untreated) rose from 19.7 percent in 1990, to 27.4 percent in 2000, and 30.8 percent in 2010.<sup>13</sup> The number of cases of hypertension is estimated to increase from 130 million in 2010, to 216 million in 2030. Effecting this spectacular growth are factors such as population growth and aging, mass migration from rural to urban area, and changes in lifestyle.

What is true for Africa in general also appears to be true for Nigeria. The prevalence of hypertension is high and getting higher. A meta-study of hypertension studies in nine States in Nigeria (covering the period 1995-2007) shows hypertension levels ranging from 14.5 percent to 34.8 percent.<sup>14</sup> Given those worrisome statistics, the question naturally arises: to what extent can the health insurance intervention, together with qualitative upgrades of participating clinics and hospitals, contribute to battling this growing health problem?

---

<sup>13</sup> Estimating the prevalence and awareness rates of hypertension in Africa: a systematic analysis, Davies Adeloye and Catrina Basquill, PLOS ONE, August 4, 2014

<sup>14</sup> A meta-analysis of prevalence rate of hypertension in Nigerian populations, O.I. Ekechukwu and C.N. Aguwa, Journal of Public Health and Epidemiology, Vol 3, December 2011.

The baseline data for Kwara State shows hypertension levels of 18.9 percent in the program area and 23.6 percent in the control area.<sup>15</sup> Blood pressure was also measured during the follow-up surveys, thus allowing for measurement of the impact of the intervention on awareness of hypertension as well as the effectiveness of hypertension treatment. The following five studies (4.1-4.5) show the results of studying various aspects of the treatment of hypertension within the context of a general health intervention such as the Health Insurance program in rural Kwara. The studies look at a number of new ideas to improve the effectiveness of treatment, such as group-based cardiovascular health education and staff training. All results point in the same direction: hypertension care within the context of a subsidized private health insurance program can be cost-effective. Public private partnerships such as the KSHI program can provide opportunities to finance hypertension care and prevention in sub-Saharan Africa.

### **Mother and Child Health**

Another major health problem, globally as well as in sub-Saharan Africa, concerns the health of mother and child (MCH). Great strides have been made in recent decades. Currently, 17,000 *fewer* children die *per day* than per day in 1990. But considerable work still remains to be done: six million children die before their fifth birthday each year. Four out of five of those deaths occur in sub-Saharan Africa and Southern Asia. Closely related to this is the progress made to prevent maternal mortality. Globally, it has decreased by fifty percent since 1990. However, the maternal mortality ratio (i.e., the ratio of mothers who die during childbirth to those who survive) is still 14 times higher in developing countries than in the developed world. Again the question arises: to what extent can a health insurance type of intervention, such as the KSHI, which takes a general approach to health (rather than a specific MCH focus), contribute to make further progress against child mortality and maternal mortality. Key to such progress is delivery in a well-equipped and well-staffed hospital or clinic, and timely access to healthcare for the very young.

The following six studies (4.6-4.11), address these questions. The first study looks at the effect that the KSHI program has on hospital deliveries. It turns out that voluntary health insurance combined with quality healthcare services is highly effective in increasing hospital deliveries in rural Nigeria, by improving access to healthcare for insured and uninsured women in the program area. The second study shows that the KSHI program does make a cost-effective contribution to improving MCH, but also shows that more specific funding is necessary to make further progress.

The third study looks at a similar program in Kenya. Here the situation is different because the subsidized private health insurance intervention exists side-by-side with a program funded by the National Health Insurance Fund. In addition, the government of Kenya has recently announced a new program that provides free MCH services to all. The study concludes that the free program does increase facility deliveries, but also finds that more research is needed to better understand why some women still prefer to deliver at home.

---

<sup>15</sup> Hendriks, M. E., et al. (2014). Effect of Health Insurance and Facility Quality Improvement on Blood Pressure in Adults with Hypertension in Nigeria A Population-Based Study. *JAMA internal medicine*, 174 (4), 555-563.

The fourth study looks at impediments for hospital or clinic delivery in rural Kenya. Cost, access and distance were among the major causes for women to prefer delivery at home.

The fifth study looks at the effect of the KSHI program (in Nigeria) on weight at birth (which is one of the most important indicators of a newborn's chance of survival). The study finds health insurance significantly increases the birth weight of newborns and increases healthcare utilization among insured infants.

Finally, the study described in 4.11 shows that the KSHI program has been effective in significantly increasing the nutritional status of young children. Again, early access to good and affordable healthcare was key to this result.

Summing up, the primary focus of the impact evaluations have been on access to healthcare and its affordability. These studies showed robust results on large positive outcomes. The subsequent studies on health outcomes now show convincingly that, for the types of diseases studied so far, the health insurance intervention has been successful in significantly improving health outcomes.

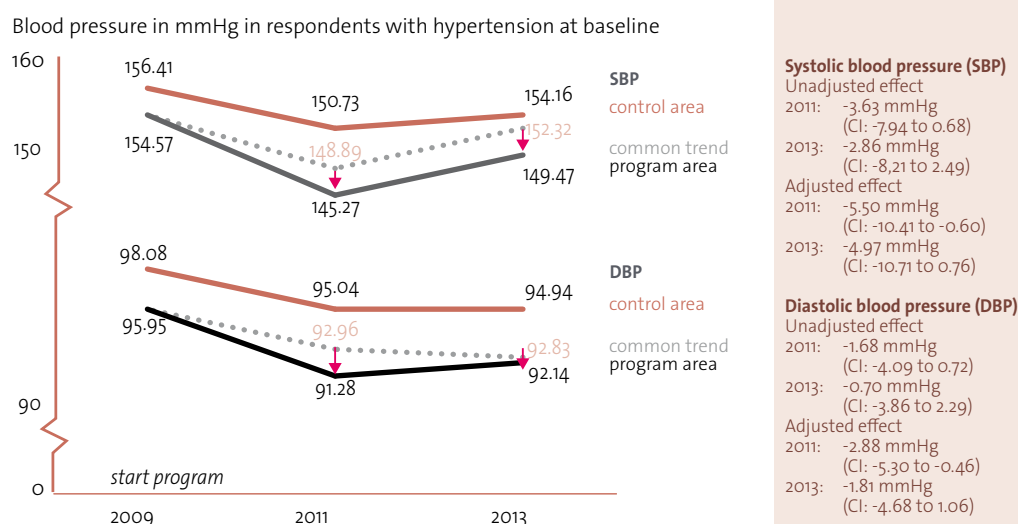
#### **4.1 Sustained effect of health insurance and facility quality improvement on blood pressure in adults with hypertension in Nigeria: A population-based study**

Hypertension is a leading risk factor for death in sub-Saharan Africa. Quality treatment is often not available or affordable. The authors assessed the effect of a voluntary health insurance program, including quality improvement of healthcare facilities, on blood pressure (BP) in hypertensive adults in rural Nigeria.

The authors compared changes in outcomes from baseline (2009) to midline (2011) and end-line (2013) between non-pregnant hypertensive adults in the insurance program area (PA) and a control area (CA) through household surveys. The primary outcome was the difference between the PA and CA in change in BP, using difference-in-differences analysis.

Of 1500 eligible households, 1450 (96.7%) participated, including 559 (20.8%) hypertensive individuals, of which 332 (59.4%) had follow-up data. Insurance coverage increased from 0% at baseline to 41.8% at end-line in the PA and remained under 1% in the CA. The PA showed a 4.97 mm Hg (95% CI: - 0.76 to + 10.71 mm Hg) greater decrease in systolic BP and a 1.81 mm Hg (- 1.06 to +4.68 mm Hg) greater decrease in diastolic BP from baseline to end-line, compared to the CA. Respondents with stage 2 hypertension showed an 11.43 mm Hg (95% CI:1.62 to 21.23 mm Hg) greater reduction in systolic BP and 3.15 mm Hg (- 1.22 to + 7.53 mm Hg) greater reduction in diastolic BP in the PA, compared to the CA. Attrition did not affect the results.

Figure 5: Change in mean blood pressure over time in respondents with hypertension at baseline



This figure shows the development over time of blood pressure measurements in the program and control areas.

## 4.2 How group-based cardiovascular health education affects treatment adherence and blood pressure control among insured hypertensive Nigerians: A pre-test, post-test study

In sub-Saharan Africa access to affordable hypertension care through health insurance is increasing. But due to poor adherence, hypertension treatment outcomes often remain poor. Patient-centered educational interventions may reverse this trend. Using a pre-test/post-test design, in this study the authors investigated the effects of a structured cardiovascular health education program (CHEP) on treatment adherence, blood pressure (BP) control and body mass index (BMI) among Nigerian hypertensive patients who received guideline-based care in a rural primary care facility, in the context of a community based health insurance program. Study participants included 149 insured patients with uncontrolled BP and/or poor self-reported medication adherence after 12 months of guideline-based care. All patients received three group-based educational sessions and usual primary care over 6 months. This study evaluated changes in self-reported adherence to prescribed medications and behavioral advice (primary outcomes); systolic BP (SBP) and/or diastolic BP (DBP) and BMI (secondary outcomes); and beliefs about hypertension and medications (exploratory outcomes). Outcomes were analyzed with descriptive statistics and regression analysis. 140 patients completed the study (94%). At 6 months, more participants reported high adherence to medications and behavioral advice than at baseline: respectively, 101 (72%) versus 70 (50%), ( $p < 0.001$ ) and 126 (90%) versus 106 (76%), ( $p < 0.001$ ). Participants with controlled BP doubled from 34 (24%) to 65 (46%), ( $p = 0.001$ ). The median SBP and DBP decreased from 129.0 to 122.0 mmHg, ( $p = 0.002$ ) and from 80.0 to 73.5 mmHg, ( $p < 0.001$ ), respectively. BMI did not



change ( $p = 0.444$ ). Improved medication adherence was associated with a decrease in medication concerns ( $p = 0.045$ ) and improved medication self-efficacy ( $p < 0.001$ ). By positively influencing patient perceptions of medications, CHEP strengthened medication adherence and, consequently, BP reduction among insured hypertensive Nigerians. This educational approach can support cardiovascular disease prevention programs for Africa's growing hypertensive population.

### **4.3 Enablers and barriers for implementing high-quality hypertension care in a rural primary care setting in Nigeria: Perspectives of primary care staff and health insurance managers**

Hypertension is a highly prevalent risk factor for cardiovascular diseases in sub-Saharan Africa that can be modified through timely and long-term treatment in primary care.

The authors explored perspectives of primary care staff and health insurance managers on enablers and barriers for implementing high-quality hypertension care, in the context of a community-based health insurance program in rural Nigeria.

Qualitative study using semi-structured individual interviews with primary care staff ( $n = 11$ ) and health insurance managers ( $n = 4$ ). Data were analyzed using standard qualitative techniques.

Both stakeholder groups perceived health insurance as an important facilitator for implementing high-quality hypertension care because it covered costs of care for patients and provided essential resources and incentives to clinics: guidelines, staff training, medications, and diagnostic equipment. Perceived inhibitors included the following: high staff workload; administrative challenges at facilities; discordance between healthcare provider and insurer on how health insurance and provider payment methods work; and insufficient fit between some guideline recommendations and tools for patient education and characteristics/needs of the local patient population. Perceived strategies to address inhibitors included the following: task-shifting; adequate provider payment benchmarking; good provider-insurer relationships; automated administration systems; and, tailoring guidelines/patient education.

By providing insights into perspectives of primary care providers and health insurance managers, this study offers information on potential strategies for implementing high-quality hypertension care for insured patients in sub-Saharan Africa.

#### **4.4 Costs and cost-effectiveness of hypertension screening and treatment in adults with hypertension in rural Nigeria in the context of a health insurance program**

High blood pressure is a leading risk factor for death and disability in sub-Saharan Africa. This study evaluates the costs and cost-effectiveness of hypertension care provided within the Kwara State Health Insurance (KSHI) program in rural Nigeria.

A Markov model was developed to assess the costs and cost-effectiveness of population level hypertension screening and subsequent antihypertensive treatment for the population at-risk of cardiovascular disease (CVD) within the KSHI program. The primary outcome was the incremental cost per disability-adjusted life year (DALY) averted in the KSHI scenario compared to no access to hypertension care. Setting-specific and empirically-collected data were used to inform the model. Two strategies were defined to assess eligibility for antihypertensive treatment based on 1) presence of hypertension grade 1 and 10-year CVD risk of >20%, or grade 2 hypertension irrespective of 10-year CVD risk (hypertension and risk based strategy), and 2) presence of hypertension in combination with a CVD risk of >20% (risk based strategy). Researchers generated 95% confidence intervals around the primary outcome through probabilistic sensitivity analysis. They conducted one-way sensitivity analyses across key model parameters and assessed the sensitivity of the results to the performance of the reference scenario.

Screening and treatment for hypertension was potentially cost-effective but the results were sensitive to changes in underlying assumptions with a wide range of uncertainty. The incremental cost-effectiveness ratio for the first and second strategy respectively ranged from US\$ 1,406 to US\$ 7,815 and US\$ 732 to US\$ 2,959 per DALY averted, depending on the assumptions on risk reduction after treatment and compared to no access to antihypertensive treatment.

Hypertension care within a subsidized private health insurance program may be cost-effective in rural Nigeria and public private partnerships such as the KSHI program may provide opportunities to finance CVD prevention care in sub-Saharan Africa.

#### **4.5 Development of a cardiovascular health education program for primary care patients with hypertension in rural Nigeria: A qualitative study**

Patient-centered, culturally tailored cardiovascular health education has the potential to improve hypertension self-management. Despite the high prevalence of hypertension in sub-Saharan Africa, this type of health education is hardly available in this region.

Applying concepts of “cultural adaptation”, the authors took a hypertension education program from Europe as a starting point for program-development. First, they collected information on socio-cultural perspectives on hypertension care through a literature review and qualitative interviews with 40 hypertensive patients and 15 healthcare professionals/insurance managers in Kwara State Nigeria. Second,

they used this information to adapt the content (deep structure) and the form (surface structure) of the European program to the unique patient population and circumstances of a primary care clinic in Kwara. Third, they evaluated the adapted program among 149 hypertensive patients from this clinic.

The interviews offered insight into patient perspectives on hypertension, socio-cultural and environmental inhibitors and facilitators for medication/ behavioral self-management (e.g., exercise) and on healthcare professional perspectives on optimal education delivery platforms – group counseling, posters, audiovisuals. These insights were used to adapt elements (e.g., educational tools, content) of the existing educational program. The adapted program has been shown to strengthen medication adherence and consequently blood pressure control among the targeted population.

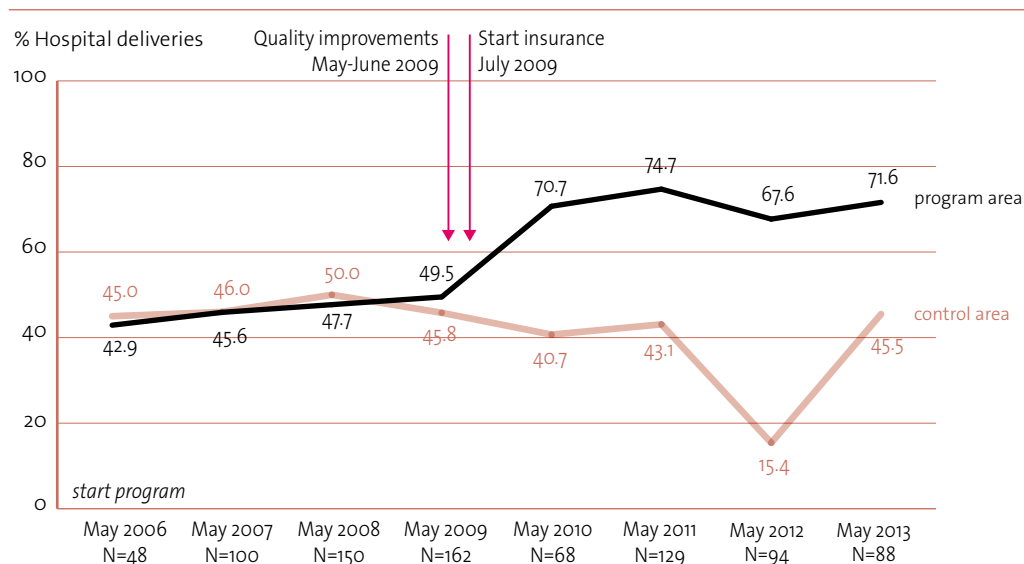
#### **4.6 The effect of health insurance and health facility-upgrades on hospital deliveries in rural Nigeria: A controlled interrupted time-series study**

Access to quality obstetric care is considered essential to reducing maternal and newborn mortality. This study evaluates the effect of the introduction of a multifaceted voluntary health insurance program on hospital deliveries in rural Nigeria. It used an interrupted time-series design, including a control group. The intervention consisted of providing voluntary health insurance covering primary and secondary healthcare, including antenatal and obstetric care, combined with improving the quality of healthcare facilities. The study compared changes in hospital deliveries from 1 May 2005 to 30 April 2013 between the program area and control area in a difference-in-differences analysis with multiple time periods, adjusting for observed confounders. Data was collected through household surveys. Eligible households (n=1500) were selected from a stratified probability sample of enumeration areas. All deliveries during the 4-year baseline period (n=460) and 4-year follow-up period (n=380) were included.

Insurance coverage increased from 0% before the insurance was introduced to 70.2% in April 2013 in the program area. In the control area insurance coverage remained 0% between May 2005 and April 2013. Although hospital deliveries followed a common stable trend over the 4 pre-program years ( $P=0.89$ ), the increase in hospital deliveries during the 4-year follow-up period in the program area was 29.3 percentage points (95% CI: 16.1 to 42.6;  $P < 0.001$ ) greater than the change in the control area (intention-to-treat impact), corresponding to a relative increase in hospital deliveries of 62%. Women who did not enroll in health insurance but who could make use of the upgraded care delivered significantly more often in a hospital during the follow-up period than women living in the control area ( $P=0.04$ ).

In conclusion, voluntary health insurance combined with quality healthcare services is highly effective in increasing hospital deliveries in rural Nigeria, by improving access to healthcare for insured and uninsured women in the program area.

Figure 6: Percentage of hospital deliveries per year



This figure shows the percentage of deliveries that were reported to have taken place in a hospital, by year

### Key Messages

- Provision of a combination of voluntary health insurance and quality healthcare increased hospital deliveries by 29 percentage points (62%) among both insured and uninsured women in the intervention area in rural Nigeria.
- Insurance enrollment increased from 0% to 70% after the intervention.
- The findings provide important evidence that a health system intervention can be effective and cost-effective in delivering maternal healthcare services, providing an alternative to vertical programs that solely focus on maternal and new-born health.
- Distance to a program hospital was both an independent determinant of hospital delivery and of insurance enrollment. The distance to program hospitals should therefore be included in the program design of voluntary health insurance programs.

## 4.7 Improving maternal care through a state-wide health insurance program: A cost and cost-effectiveness study in rural Nigeria

While the Nigerian government has made progress towards the Millennium Development Goals, further investments are needed to achieve the targets of post-2015 Sustainable Development Goals<sup>16</sup>, which include Universal Health Coverage. Economic evaluations of innovative interventions can help inform investment decisions in resource-constrained settings. The researchers aim to assess the cost and cost-effectiveness of maternal care provided within the new Kwara State Health Insurance program (KSHI) in rural Nigeria.

The researchers looked at the possibility and sustainability to scale up this program. They used a model to simulate a cohort of pregnant women. The primary outcome is the incremental cost effectiveness ratio (ICER) of the KSHI scenario compared to the current standard of care. ICER is defined as the difference in cost between two possible interventions, divided by the difference in their effect. Intervention cost – from a healthcare provider perspective – included service delivery costs and above-service level costs; these were evaluated in a participating hospital and using financial records from the managing organizations, respectively. Standard of care costs – from a provider perspective – were derived from the literature. Using statistical methods researchers generated 95% credibility intervals around the primary outcome. They conducted one-way sensitivity analyses across key model parameters and assessed the sensitivity of the results to the performance of the base case separately through a scenario analysis. Finally, they assessed the sustainability and feasibility of this program's scale up within the State's healthcare financing structure through a budget impact analysis. The KSHI scenario results in a health benefit to patients at a higher cost compared to the base case. The mean ICER (US\$46.4/disability-adjusted life year averted) is considered very cost-effective compared to a willingness-to-pay threshold of one gross domestic product per capita (Nigeria, US\$ 2012, 2,730). The study's conclusion was robust to uncertainty in parameters estimates (PSA: median US\$49.1, 95% credible interval 21.9–152.3), during one-way sensitivity analyses, and when cost, quality, cost and utilization parameters of the base case scenario were changed. The sustainability of this program's scale up by the State is dependent on further investments in healthcare.

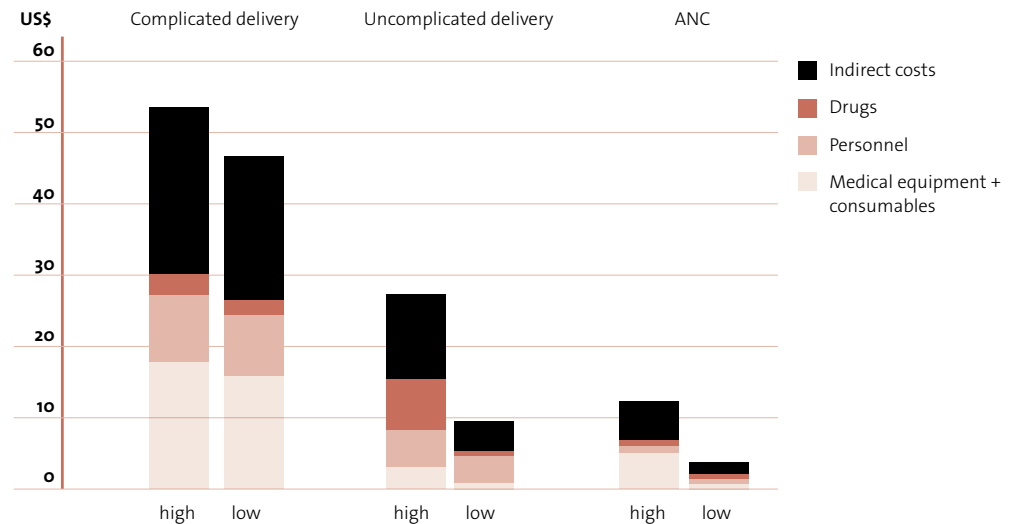
This study provides evidence that the investment made by the KSHI program in rural Nigeria is likely to have been cost-effective; however, further healthcare investments are needed for this program to be successfully expanded within Kwara State. Policy makers should consider supporting financial initiatives to reduce maternal mortality, tackling both supply and demand issues in the access to care.

---

<sup>16</sup> Please visit the United Nations website on Sustainable Development Goals [www.un.org/sustainabledevelopment/sustainable-development-goals/](http://www.un.org/sustainabledevelopment/sustainable-development-goals/)



Figure 7: Unit costs by cost category for low and high utilization profiles



This figure shows unit costs by cost input. For complicated deliveries, the unit cost was driven by the direct costs of equipment, consumables, and personnel; whereas for uncomplicated deliveries, personnel and drug costs largely defined the total unit cost

#### 4.8 The impact of The Community Healthcare Plan, the National Health Insurance Fund, and the free maternal care program on maternal and child healthcare utilization in rural Kenya: A population-based study

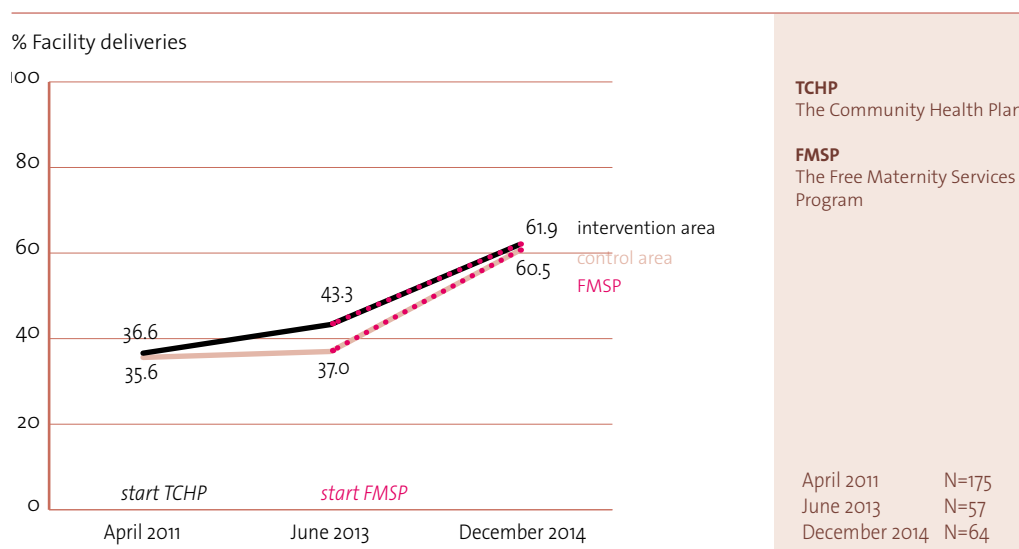
Access to quality maternal and child health services is generally recognized as the best way to lower high maternal and newborn mortality. This study evaluated whether The Community Health Plan (TCHP), National Health Insurance Fund (NHIF) and the free maternity services program (FMSP) can increase antenatal care utilization and facility deliveries among pregnant women in rural Kenya.

TCHP was introduced on 1 April, 2011, and consisted of voluntary prepaid family health insurance and improved healthcare facilities. NHIF was introduced in 1966 and consisted of (in most cases mandatory) family health insurance. The free maternity services program was provided by the Kenyan government on 1 June, 2013. It includes free access to maternal and child health services in all public facilities in Kenya. To measure the impact of TCHP, changes in antenatal care utilization and facility deliveries from baseline to follow-up between the intervention area and a control area were compared in intention-to-treat analysis. To measure the impact of the free maternity services program, a before-after comparison of the same outcome variables in the combined intervention and control areas was assessed. The effect of NHIF was assessed in the combined areas as well. Households (N=549) were randomly selected from the complete member lists of two dairy cooperatives. All women aged 15 to 45 who delivered in the three-and-a-half years preceding the baseline (N=199) or follow-up (N=135) surveys were eligible for this study (N=296).

Enrollment in NHIF was substantial with around 40% of all pregnant women being enrolled (including during pregnancy). However, only four women were insured with TCHP (during pregnancy). This means that there could only be an impact of TCHP as a result of spill-over effects, such as women without TCHP insurance making use of the upgraded facilities. Indeed, antenatal care utilization significantly increased after the introduction of TCHP (12.7 PP increase; 95% CI 6.0 to 19.4,  $p < 0.001$ ). The study did not find an impact of NHIF or the free maternity services program on antenatal care utilization. However, facility deliveries significantly increased after the introduction of the free maternity services program (24.1 PP increase; 95% CI 3.6 to 44.6,  $p = 0.021$ ). The authors did not find an impact of TCHP or NHIF on facility deliveries.

Access to the free maternity services program in public facilities increased facility deliveries. Provided that quality of delivery services in the public healthcare facilities is sustained or further improved, the government program can be expected to help improve maternal and newborn health and survival. Insurance uptake in TCHP was very low and consequently only spill-over effects of the TCHP program on antenatal care utilization were found.

*Figure 8: Percentage facility deliveries over time*



*This figure shows the development over time of facility deliveries in the intervention and control areas.*

#### 4.9 Factors influencing decision for home- or facility-based delivery after implementation of Free Maternal Care in Nandi County, Kenya

Maternal and neonatal deaths remain high in many parts of sub-Saharan Africa, including Kenya. While facility delivery is commonly accepted to be safer than home delivery, the majority of deliveries still occur at home. Understanding the reasons for choosing facility or home delivery is essential to design effective interventions to increase facility deliveries, and so reduce maternal and neonatal mortality rates.

This study utilized a transdisciplinary perspective. Semi-structured interviews were held with community health volunteers and traditional birth attendants to identify barriers and facilitators of facility delivery. Reflective interviews were held to present results to stakeholders and identify possible interventions. In addition, whether distance had an effect on facility delivery was assessed by means of logistic regression. Distance was tested as a continuous variable, and at a threshold of 5km and 3.4km, the latter being the average distance to the facility.

The interviews identified staff attitudes, financial and geographic accessibility, corruption and distance as the main reasons why women avoided facilities. Two main facilitators were the medical benefits and the removal of costs. Distance was only significantly associated with facility delivery at the 3.4km threshold (12.12 PP, 95% CI 0.03 to 0.97,  $p=0.04$ ).

To conclude, this report has identified various reasons women have for seeking out, or avoiding, health facilities for delivery. To increase facility deliveries multi-faceted interventions are required tailored to different settings across Kenya. This study contributes to this goal by elucidating reasons for and against facility delivery.

#### 4.10 Effect of health insurance and health facility improvements on birth weight and infant healthcare utilization in rural Nigeria<sup>17</sup>

Weight at birth is one of the most important indicators of a newborn's chances of survival and long-term health. Affordable, accessible and quality perinatal healthcare is critical for preventing low birth weight and improving healthcare utilization. The aim of this study was to determine the impact of the Kwara State Health Insurance program on birth weight and on infant healthcare utilization in rural Nigeria.

The authors conducted a prospective cohort study of 391 pregnant women and 301 infants in Afon (the treatment area) and Ajassee-Ipo (control area) districts. Data were collected through pregnancy and infant surveys, followed up on a four-monthly basis for a one-year period. The study end points were the difference in birth weight and healthcare utilization between the (insured people in the) treatment area and the control area. Secondary end point was the differences in the number of perinatal deaths. Linear regression was used to estimate the effect of having health insurance (in the program area) on birth weight.

---

<sup>17</sup> This paper is under review

The authors found that being insured was associated with a significantly higher birth weight of 0.215kg ( $p=0.033$ , adjusted analysis). In addition, insured infants in the program area had higher healthcare utilization, compared with infants in the control area (52.9% vs 9.5%) ( $p=0.003$ ). A non-significant difference was found in the incidence of perinatal deaths (4.9% vs 6.6%,  $p=0.58$ ) and incidence of Low Birth Weight [LBW] (7.7% vs 4.2%,  $p=0.71$ ) between the insured in the program area and control area.

This study shows that in Nigeria health insurance was associated with a significantly higher birth weight and increase in healthcare utilization. Larger studies are needed to confirm its effect on perinatal mortality and assess if the effect on birth weight is also translated in a significant reduction in the number of LBW babies.

#### **4.11 The effect of health insurance and healthcare facility-upgrades on nutritional status of children in rural Nigeria: A longitudinal study<sup>18</sup>**

A health system intervention was introduced in rural Nigeria consisting of both private voluntary health insurance and improvement of quality of care offered by healthcare facilities. The researchers investigated its effect on nutritional status, as proxy for health, of children younger than 5 years.

Using a quasi-experimental design, the study compares changes in outcome from baseline (2009) to follow-up (2010) between the intervention area and a control area in quantile difference-in-differences analysis (intention-to-treat effects). Additional dynamic panel data analysis was performed to separate the effects of insurance and healthcare utilization on outcome in the intervention area during follow-up (2010-2013) (treatment effects). The primary and secondary outcome were weight-for-height and height-for-age, respectively.

In both areas, 10% of children were wasted at baseline. One-and-a-half years after the introduction of the program, the bottom 10% percentile of the weight-for-height z-score distribution increased 0.41 SD (95% CI: 0.03-0.96) more in the intervention area (insured and uninsured children) than in the control area. Within the intervention area, being insured and utilizing healthcare (mostly in program facilities) independently improved the weight-for-height z-score of wasted children by 0.81 SD (95% CI: 0.18-1.44) and 0.23 SD (95% CI: 0.01-0.44) during a two-year period, respectively. Health insurance enrollment improved the height-for-age z-score of stunted children younger than 2 years by 0.48 SD (95% CI: 0.11-0.85). No impact was measured on children who were not wasted or stunted.

Health insurance and utilization of improved healthcare were effective strategies to improve the nutritional status of malnourished children in rural Nigeria. This cost-effective health system intervention can prove an effective alternative to targeted interventions solely focused on feeding practices.

---

<sup>18</sup> This paper is under review

# 5 Special studies

This section presents the results from a number of special studies not directly relating to the impact on healthcare utilization, out-of-pocket spending or Health Outcomes.

## 5.1 Evaluation of The Community Healthcare Plan in Nandi North, Kenya: Enrollment and dropout

In sub-Saharan Africa, patients pay 32% of total health expenditure out-of-pocket. Health insurance has been advocated as a way of preventing catastrophic personal health expenditure. However, health insurance program enrollment rates in sub-Saharan Africa remain low, endangering their sustainability.

In 2011, the Tanykina Community Healthcare Plan was introduced in rural Kenya among dairy farmers and their families affiliated with the Tanykina Dairy Company. In May/June 2013 the program was redesigned and the name changed to The Community Healthcare Plan (TCHP). This follow-up study, conducted in 2014, focuses on a descriptive analysis of enrollment in and dropout from the TCHP program. In addition, it examines barriers to and facilitators of enrollment, and factors that may explain why enrollment was lower than expected. The study contains a qualitative and a quantitative part. An in-depth qualitative study was conducted before the follow-up survey. Through interviews with the Tanykina and Lelbren Dairy management, district officers, staff from health facilities and clinics (both TCHP and non-TCHP), AAR Insurance, National Hospital Insurance Fund (NHIF), and other stakeholders, the context in which the TCHP program has operated was explored. The qualitative research was built upon the baseline survey, which was conducted among Tanykina dairy farmers and their households in 2011. The follow-up survey included detailed questions on health insurance, healthcare utilization, health-related expenditure, the TCHP scheme, and questions regarding other healthcare interventions.

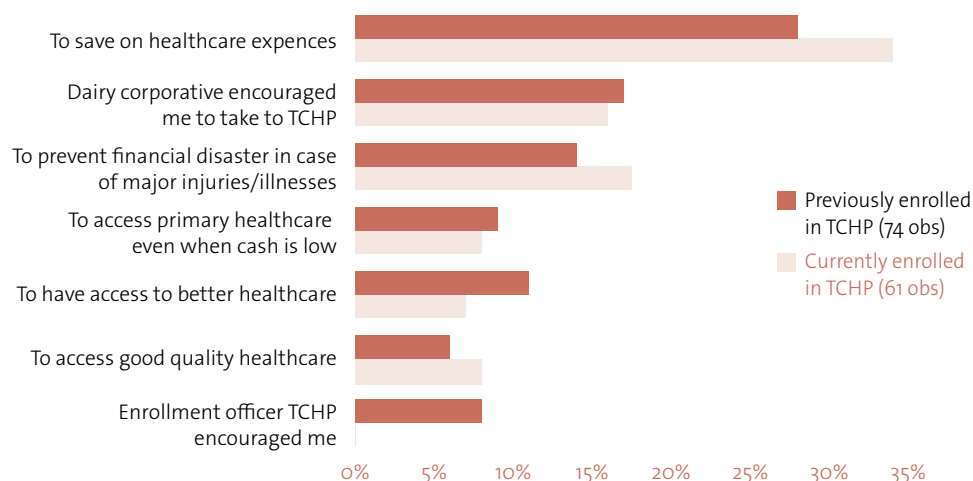
Since the start of TCHP almost 22% of the households included in the baseline and follow-up survey were ever enrolled in TCHP by the end of 2014 (cumulative enrollment). The current enrollment rate in December 2014 was 9%. In comparison with the whole target population of 4,500 Tanykina dairy farming families, a similar enrollment rate was observed in December 2014 (9%), but more households had ever enrolled in TCHP (36%). The difference between the target population and the survey sample may be explained by the fact that the first is a dynamic population with new families replacing those no longer active in the dairies. In contrast, the survey sample is static.

At the time of the household survey, 4.5% of the interviewed household members were not aware of the household's current TCHP enrollment status: 0.8% were not aware of currently being enrolled (these households recently re-enrolled) and 3.7% were not aware of currently not being enrolled. Of the households enrolled in December 2014, 35% were enrolled in the basic package and 65% in the comprehensive package. More than two thirds of these households were aware of their current benefit package.



Among the reasons why households were not enrolled in TCHP, it was most often reported that households did not know of TCHP (20%), that they experienced financial constraints (19%), or that production of milk was low (11%).

Figure 9: Reasons to enroll in TCHP



Main reasons for enrollment in TCHP of households that reported to have ever been enrolled in TCHP stratified by current enrollment status recorded by AAR Insurance

## 5.2 Evaluation of HIF-supported Health Insurance Projects in Tanzania: Follow-up report on the KNCU Health Plan

The Health Insurance Fund (HIF) and its implementing partner the PharmAccess Foundation (PAF) aim to facilitate access to comprehensive healthcare by providing subsidized low-cost health insurance schemes in three countries in sub-Saharan Africa (Kenya, Nigeria, and Tanzania), and by improving the quality of health facilities.<sup>19</sup> The programs aim to build better and more sustainable healthcare infrastructures to contribute to a healthier and more productive population.

In April 2011, the Health Insurance Fund launched the Kilimanjaro Native Cooperative Union (KNCU) Health Plan in the Kilimanjaro region in Tanzania. The target population is located in a rural area and has an hourglass shaped age distribution, with relatively few working age individuals. The elderly are often taking care of grandchildren, receiving remittances from family members working in the city.

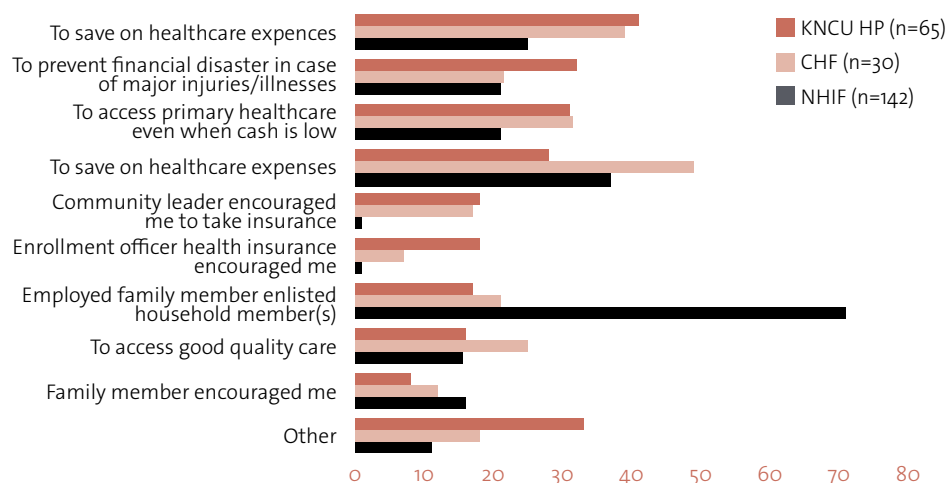
<sup>19</sup> For more information on the quality improvement program see the SafeCare website [www.safe-care.org](http://www.safe-care.org).

The KNCU Health Plan offered subsidized health insurance to KNCU coffee farmers and their households. KNCU is Africa's oldest cooperative and represents small-scale coffee farmers, organized in so-called primary societies, most of which sell their coffee through KNCU. The insurance was offered at household level at a subsidized price and covered comprehensive primary and maternal secondary healthcare services in designated, and often recently upgraded, health facilities. In addition, a selection of registered and approved medications was included in the insurance benefit package. The KNCU Health Plan was gradually expanded by adding primary societies into the insurance scheme. By October 2013, a total of fifteen primary societies were included in the KNCU Health Plan in Moshi Rural district, ten in Hai district, and one in Siha district.

To attain long-term sustainability of the program, the PharmAccess Foundation and local governments in the Kilimanjaro region have partnered to join the KNCU Health Plan and the Community Health Fund (CHF) – a publicly available community-based health insurance scheme managed by the district governments – into the so-called improved Community Health Fund (iCHF). The iCHF covers many aspects of the KNCU Health Plan, but is extended to the general population, includes private and public health facilities, and offers up to five days of in-patient care. At present, iCHF has been introduced in three Kilimanjaro districts: Siha (November 2014), Moshi Rural (January 2015), and Hai (May 2015). Individuals insured by the KNCU Health Plan were automatically transferred to iCHF. In February 2016, approximately one year after the follow-up survey, 7,409 individuals were enrolled in Siha, 21,865 individuals in Moshi Rural, and 10,065 individuals in Hai.

As part of the Health Insurance Fund program, the Amsterdam Institute for International Development (AIID) and the Amsterdam Institute for Global Health and Development (AIGHD) initiated an Impact Evaluation of the KNCU Health Plan. The goal of the Impact Evaluation is to estimate the impact of the KNCU Health Plan on outcomes such as subjective and objective measures of health status of KNCU farmers and their households, their healthcare utilization, and their out-of-pocket health expenditure. As part of the Impact Evaluation, two household surveys have been conducted, a baseline survey in the first quarter of 2013 and a follow-up survey in March 2015. This report is purely descriptive in nature. It describes the follow-up survey data and serves as a starting point for the KNCU Health Plan Impact Evaluation.

Figure 10: Reasons for enrollment in health insurance scheme

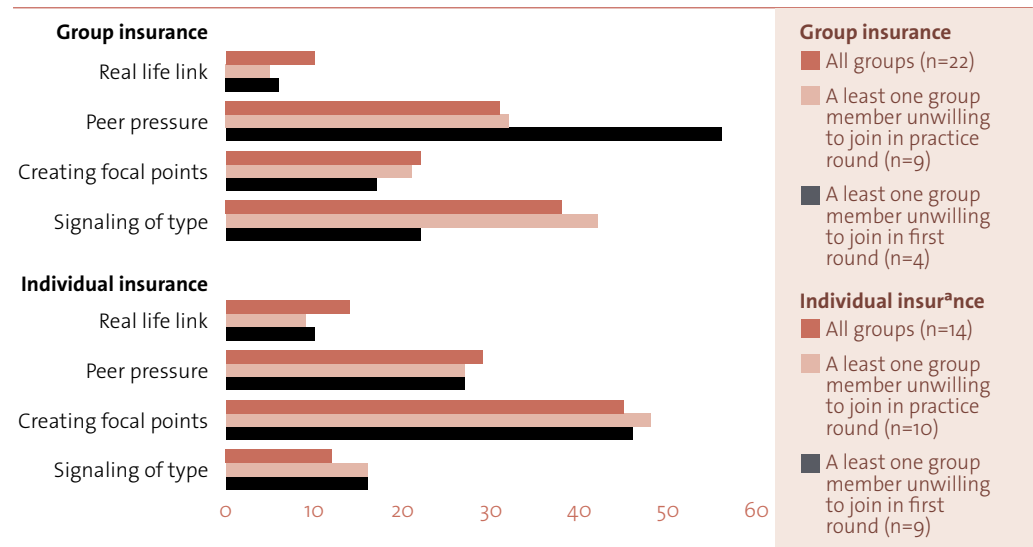


The figure shows reasons why households enrolled in a particular insurance that they were insured by 12 months prior to the follow-up survey.

### 5.3 The social dilemma of microinsurance: Free-riding in a framed field experiment

Health shocks are among the most important unprotected risks for microfinance clients, but take-up of micro health insurance remains low. A field experiment with credit groups in Tanzania, eliciting demand for group versus individual insurance, attributes this to a social dilemma. In a context of joint liability, insurance is a public good because clients can rely on contributions from group members to cope with health shocks. The researchers hypothesize that clients have a private incentive to free-ride and forgo individual insurance even when full enrollment optimizes group welfare. The binding nature of group insurance eliminates such free-riding. This experiment yields substantial support for this hypothesis. Whereas the demand for group insurance is high, a substantial share of clients forgoes individual insurance and relies on peers to repay their loan when falling ill. Group insurance can potentially increase low take-up rates.

Figure 11: First-round communication by topic and demand for insurance



The figure presents the average percentage of statements in a group's first-round communication that is classified by category (group insurance (top panel) and individual insurance (bottom panel)). In order of presentation, these categories represent (1) discussions on how the game relates to real-life health insurance; (2) statements on joint liability, norms of solidarity and externalities of decisions for peers; (3) discussions on (private) benefits of insurance as financial protection against shocks; and, (4) intentions to take health insurance.

In both panels, the first (dark) bar for each category includes all groups independent of behavior. Groups were substantially more likely to signal intentions when offered group insurance – they mainly discussed whether to vote for insurance. Groups offered individual insurance were more likely to create focal points, highlighting an individual's benefits from having insurance. Peer pressure (invoking social norms, discussing joint liability) was equally common in the two treatments.

# 6 Capacity building

Since 2008, the Amsterdam Institute for Global Health and Development (AIGHD) together with the Amsterdam Institute for International Development (AIID) have carried out joint research together with their local research partners on Health Insurance Fund-supported programs. In total, 14 studies were carried out in Nigeria, 5 in Kenya with another 4 studies took place in Tanzania. Not only has this research led to a large body of work in the form of peer reviewed publications and reports (listed under Annex 1) but has also contributed the PhD theses of 7 students (two of them from Nigeria) as well as 15 MSc students' theses. Of the 23 peer reviewed articles 5 have a local researcher as (joint) first author while a further 13 have a local researcher as an author on the paper. More peer-reviewed publications, jointly published by local and Amsterdam-based researchers, are expected in 2017, especially in the field of Maternal and Child Health. The joint research initiatives have provided the researchers in The Netherlands, Nigeria, Kenya and Tanzania with opportunities to learn from one another thereby leading to better insights and the possibility to publish at a high academic quality on relevant topics.

Being involved in research has provided many of the local researchers with the opportunity to grow their experience and skills around diverse research topics. This growth in knowledge works both ways, with Amsterdam-based researchers getting better insight into the local context, allowing for better problem analyses and research to address the issue. The research has also afforded a large number of individuals with the chance to train and carry out work in the field as data collectors; a skill that they can utilize in other research projects in future years. Some of the fieldwork made use of data collection through mobile devices, a further key skill attained.

Local PhD students from Nigeria have been able to attend courses on the use of quantitative and qualitative methods at various universities in The Netherlands. For those researchers unable to travel to The Netherlands, AIGHD has developed and given a qualitative data analysis course in Ilorin, Nigeria. The course was provided by Anja van't Hoog and Daniella Brals over five days (3-7 April, 2017). Twenty-eight public health resident doctors participated in the course, which was kindly organized by Professor Tanimola M. Akande (College of Health Sciences, University of Ilorin). The course was developed by AIGHD and combined elements of Duke University Statistics course and AIGHD Global Health Masters' Course.

Course attendees learned data analysis in the statistical software programs R and RStudio along with an introduction to the Kwara household survey data sets. Course topics ranged from cleaning and exploring data, presenting data in advanced tables and graphs, and conducting hypothesis testing. As part of the course, the attendees also collected their own small dataset, which they had to load, clean and analyze in RStudio and subsequently they had to give a presentation about their results. Attendees received a certificate upon completion of the course. The attendees are currently working in groups continuing with their own analysis of the Kwara household survey datasets. AIGHD will continue to provide Technical Assistance to these researchers so they can develop and secure funding for new research



based on these datasets. In addition, there are plans to conduct a follow-up course on regression analysis. These courses can be given to research partners in other PharmAccess countries.

### **Quotes from attendees of the Ilorin data course**

*“The RStudio data course was an eye-opener into the mind-boggling world of coding and exciting new ways to analyze data. The one-week course was tasking but impactful and I can’t wait to learn and apply some more.” – Funmi Bamigbola*

*“The course was interesting and allowed me to further understand statistics. The overall organization was excellent. Kudos to the organizers.” – Isa Abdulfattah*

*“I enjoyed the simplicity of the method of teaching that was used for the training (I have always thought that working with a software that needs ‘codes’ will be very difficult for me to learn). Also the looks of the participants as it transits from ignorance to awareness during each exercise was entertaining and encouraging. Finally, I got to know that R is very engaging, and that it requires dexterity and patience. The possibilities for analyzing data with R are massive and seem challenging but challenges help us to get better. Once again, I will like to appreciate the opportunity to be part of any further training. Thank you.” – Dr. Popoola Omotade Gbenga*

*“I had a wonderful experience with RStudio as it afforded me the opportunity to learn a newer method of statistical analysis which would be useful in my Public Health practice. I liked the program language/code, it made analysis look easy. However, am yet to fully understand all there is to it and hope to get more training on it personally. Thank you once again for the opportunity.” – Joy Abiodun*

*“The course was very interesting and effective. Just like trying to speak a new language, in this case the R language. The learning points were well thought out and presented with the collaborative group work aiding the learning process as members of each group learnt to work together to try to develop a positive competitive attitude towards being the best group for the day’s exercise. This more than any other, in my estimation, helped improve the learning process.” – Hassan Oloyede*

*“The course was innovative and hands on. I was particularly impressed on how even our own personal data was used in learning R.” – Taofik Oloyede*

*“Until I was invited for the course I had not had any form of training in RStudio programming. I liked the fact that the course actually came at the right time because afterwards I began to see potential job adverts that included being vast in RStudio programming. So I like the fact that I am not totally green in the area now. Will love to know more and someday be one of the greatest RStudio programmer in Africa. Thanks once again for the exposure.” – Moji*

# 7 Conclusion

## Developments around the KSHI program

Since January 2016, Kwara State, World Bank Group/IFC Health in Africa Initiative and PharmAccess, with the support of the Dutch Ministry of Foreign Affairs, have been working on transitioning the Kwara State Health Insurance program into a state-wide health insurance scheme. Kwara State has adopted a health insurance law that makes health insurance mandatory for all the residents of Kwara State. The successes of and learned lessons from the Kwara State community health insurance program have led to a policy change in Nigeria from federal-led to state-led health insurance, where a number of states, including Lagos, Delta and Cross River, have adopted a state health insurance law.<sup>20</sup>

According to the Financial Times (2016) and Brookings Institution (2013)<sup>21</sup>, PharmAccess has demonstrated in Kwara State that state-based health insurance schemes can deliver a decent basic healthcare coverage at USD28 per person per year compared to WHO benchmark of USD60 and Nigeria's total health expenditure per capita of USD115. This shows that there is enough money in Nigeria to provide healthcare for millions of low-income families. Advocacy for political will and good leadership is needed to ensure that both the Federal and State Governments commit to providing financing for their implementation of state-based health insurance schemes.

A mandatory health insurance is critical for ensuring the sustainability of the scheme, where middle-income and rich groups cross-subsidize the premiums of low-income and poor families. The health insurance law also mandates Kwara State Government to commit one percent of its consolidated income to health insurance. Another important aspect of state health insurance is the setting up of a State Health Insurance Fund to pool funds from local sources. Given the effective platform that health insurance offers to deliver a range of health services, Kwara State has reserved part of a grant from the World Bank's Saving One Million Lives initiative to provide mother and child healthcare. The adoption of a state health insurance law is also one of the conditions to ensure that States get support from the National Health Insurance Scheme of Nigeria. Upon the adoption of the state health insurance law, Kwara State has established a committee to facilitate the preparations towards a launch of state health insurance scheme, expected by the end of 2017.<sup>22</sup>

---

<sup>20</sup> Based on discussions held with policy makers from numerous states in Nigeria during a workshop organized by PharmAccess and AIGHD entitled "State-Supported Health Insurance Conference: a conference on research, lessons learned & capacity building for state-supported health insurance" held in Ilorin, Nigeria on 21 July 2015.

<sup>21</sup> The Kwara State Health Insurance program won the Financial Times Transformational Business Award in Health (2016) and OECD Taking Development to Scale Finalist Award (2014). Publications by the Financial Times (Birth Magazine, 17 November 2016) and Brookings Institution (Brooke Shearer Working Paper Series. Achieving Universal Health Coverage in Nigeria: One State At a Time, 2013) show the cost effectiveness of the program.

<sup>22</sup> As a result of challenges with Kwara government state funding (due to the steep decline in government resources as a consequence of the large drop in the international price for oil) re-enrollment in the Kwara State Health Insurance Program (KSHIP) was suspended in January 2016, and all enrollees have exited the program as of January 2017. Among other negative effects, healthcare providers saw a significant reduction in patient load, patients experienced financial difficulties for obtaining healthcare, clinic revenues decreased and medical staff had to be reduced. See TM Akande, et al. *Kwara Health Insurance Re-Enrollment & Enrollment Suspension: Effect on Health Care Utilization and Coping Mechanisms*.

## Developments around the TCHP program

The TCHP program started as an insurance program targeting dairy farmers, and their family members, who were members of the Tanykina Dairy Plant Ltd in Nandi County in Kenya. The insurance scheme was run by AAR insurance and included a demand side (a comprehensive insurance package) and a supply side (quality upgrades of facilities in the insurance program network) intervention. In 2013 the scheme started offering two packages, adding a basic package besides the already existing comprehensive one. In 2015, TCHP transitioned to the M-TIBA platform<sup>23</sup>, which meant that all visits through the insurance program were now running through the digital platform. The insurance company, UAP Old Mutual, took over the insurance scheme from AAR insurance in 2016. UAP already had an insurance program called Afya Kamili, which is an insurance product offering an NHIF Supa Cover including a few top-up insurance (accident, funeral). This package is currently being redesigned because take-up in the market is low.

## Developments around the KNCU program

The KNCU program transitioned into a new scheme, called the improved Community Health Fund (iCHF), which is a combination of the former KNCU scheme and the Community Health Fund (CHF). CHF is a district owned voluntary matching scheme administered by district councils. The iCHF is a voluntary, district-owned health insurance scheme that aims to increase access to quality healthcare for people in rural and low-income groups. CHF covers outpatient services in most cases only, whereas iCHF has a much more comprehensive benefits package, which includes in-patient services up to five days. iCHF increases pooling on a regional level to allow effective cross subsidization and therefore more sustainability. Currently, the benefit package is being expanded to include referral to regional hospitals. It offers affordable access to both private and public care, and emphasizes quality improvement through training, equipment provision, SafeCare assessments and infrastructure upgrading. iCHF was built by a strong partnership between NHIF, the district councils, public and private healthcare facilities, and PharmAccess. It was introduced at the end of 2014. By July 2017, more than 200,000 people had enrolled. Moreover, PharmAccess is involved in discussions on a national level to support the government in their aim to roll out a national scheme with a mandatory basic package for which the iCHF model is used. In the last quarter of 2017 a proof of concept phase will start which aims to demonstrate the health wallet<sup>24</sup> as the administrative system for the iCHF scheme.

---

<sup>23</sup> M-TIBA, which was introduced in December 2015 by a partnership consisting of Safaricom, PharmAccess, and CarePay, is a mobile “health wallet” that allows people to save, borrow, and share money for healthcare at very low costs. The platform builds on the technology of the mobile phone and all payments for health services and products are digitally recorded on real-time basis. Donors and insurers can use M-TIBA to offer healthcare financing products, such as vouchers, managed funds and low cost health insurance, to specific segments of the Kenyan population. Beneficiaries can use the dedicated funds or benefits on their health wallet in connected facilities to access healthcare by opening their own wallet on their mobile phone. For more information, please visit the M-TIBA website [www.m-tiba.co.ke](http://www.m-tiba.co.ke).

<sup>24</sup> A proof of concept for a “Health Wallet” similar to that already introduced in Kenya (see reference to M-TIBA above) is taking place in Tanzania and Nigeria.

## Some general lessons

Impact evaluations have shown conclusively that the intervention consisting of subsidized health insurance in combination with clinic upgrades improves access, provides financial protection, and improves health (“proof of concept”). While this is true in a general sense, whether the intervention can be successfully implemented is highly context specific. The situation in Kwara State was relatively simple: almost nobody had any insurance prior to the intervention, the KSHI program was the only program available to the general population and during the four-year period that the program was active, no other major health programs were available, and no major health policy changes were made. In that relatively simple and stable environment, the KSHI program was a highly successful intervention that was much appreciated by patients and providers alike. The planned roll-out of government sponsored health insurance programs in four Nigerian States is a direct result of the demonstrated success of the Kwara program.

The situations in Kenya and Tanzania are very different. There were already many players in both the treatment and control areas in these countries, with interventions and programs that were sometimes complementary and sometimes overlapping with the PharmAccess-initiated programs. In addition, changing government initiatives in the health sector (such as the decentralization of health sector management in Tanzania, and the free maternity care program in Kenya) made it necessary to adjust the planned intervention to the new environment. The flexibility shown by the program managers, and adaptation of the lessons learned during the first phase of these projects were key to the improvements in health sector management and healthcare delivery in both countries.

Another key to success is the creation of a solid public private partnership in which all parties play to their own strength. For the public sector this includes basic financing (especially for the poor), quality control through licensing and regulation, and higher level care provision (teaching hospitals). For the private sector this includes healthcare provision, clinic level quality control through accreditation, private investment and financing, and clinic and hospital level (bottom up) management. In order for the public private partnership to work, all stakeholders need to be on board from the very beginning. When donors are involved, they need a clear exit strategy.

It is also important to recognize that health insurance is not just a money issue; it calls for large investments in data collection, which leads to transparency and accountability, and allows for the implementation of modern (private sector) management practices. It also leads to innovations to increase efficiency and reduce transaction costs. A good example of such innovation is the M-TIBA program in Kenya, which uses digital technology to provide providers and managers with real time data on healthcare use and medical practices, while facilitating all money transactions involved (from direct payments, to remittances, to government and

donor contributions) to be handled swiftly and safely by use of mobile devices.<sup>25</sup> This program is currently being developed and tested by PharmAccess, in collaboration with SafariCom and CarePay, in Kenya.

Interaction between research and implementation has been highly effective. Implementation should always come first, research should follow, and accept the limitations that come with real world implementation (such as inevitable adjustment of project implementation over time). Research results should subsequently provide feedback to the implementers.<sup>26</sup> The research results presented in this report are based on large data sets that have been collected prior to project implementation, and in one or more follow-up surveys. These surveys were adjusted and expanded, to allow for studies that went beyond the general impact evaluations. Research on these data sets will continue in the coming years.

New research has started on data sets that are produced electronically from the mobile phone transactions of M-TIBA users in Kenya. While these studies are smaller in scope, they can produce results much more rapidly, even in real time, which increases their relevance for project implementation. However, in the real world, it usually takes a long time for people to adjust to a new environment, such as having access to health insurance, being able to hold clinics accountable for having sufficient drug supplies, or being able to pay providers electronically (the providers also need time to adjust to these new opportunities).

It has become common in the developing world to rigorously evaluate the impact of development projects, especially if they have many new and innovative aspects. In fact the Dutch Health Insurance Fund (HIF) was the first Dutch development project with a “built-in” impact evaluation. The experience with the interaction between research and implementation, and the many important research results that resulted from this experience, has shown conclusively how beneficial this cooperation between implementation and research can be. Finally, the cooperation between “foreign” and “local” researchers has also been greatly gratifying and will continue in the years to come.

Providing universal access to affordable and good healthcare is a high priority on every country’s development agenda. To pursue that goal in a learning mode, where policy and implementation are guided by impact research, is arguably an efficient way to achieve this goal.

---

<sup>25</sup> Please find further information at the CarePay website [www.carepay.co.ke/product/m-tiba](http://www.carepay.co.ke/product/m-tiba).

<sup>26</sup> For example, AIGHD and AIID would often carry out qualitative studies to inform their research design. The results from this work would generally be useful for the design of the intervention and thus shared with implementers. Subsequently, if remarkable findings were made by the researchers during data collection or data analysis, these would be fed back to program implementers.

# 8 Annex 1: List of reports and publications

## List of reports and publications produced by AIGHD and AIID on PharmAccess Group supported programs

### Baseline reports

2009 – J van der Gaag, et al. Impact Evaluation of HIF-supported Health Insurance projects in Nigeria: Kwara I (North) Baseline Report

2009 – J Lammers, et al. Impact Evaluation of HIF-supported Health Insurance projects in Nigeria: Preliminary results from the baseline survey in Lagos

2010 – J van der Gaag, et al. Impact Evaluation of HIF-supported Health Insurance projects in Nigeria: Kwara II (Central) Baseline Report

2010 – M Pradhan, et al. Impact Evaluation of HIF-supported Health Insurance projects in Tanzania: Micro Credit Clients, Baseline Report

2011 – J van der Gaag, et al. Impact Evaluation of HIF-supported Health Insurance projects in Kenya: Baseline Report

2013 – J van der Gaag, et al. Impact Evaluation of HIF-supported Health Insurance projects in Tanzania: Baseline Report KNCU Health Plan

### Follow up reports

2012 – J van der Gaag, et al. Impact Evaluation of HIF-supported Health Insurance projects in Nigeria: Kwara II (Central) Follow up Report

2013 – J van der Gaag, et al. Impact Evaluation of HIF-supported Health Insurance projects in Nigeria: Kwara II (Central) Second Follow up Report

2015 – J van der Gaag, et al. Evaluation of HIF-supported Health Insurance Projects in Tanzania: Follow-up Report on the KNCU Health Plan

2015 – C Schultz, et al. Follow-up report on the baseline hypertensive population in the Kilimanjaro region, Tanzania

### Impact Reports

2013 – J van der Gaag, et al. A Short-Term Impact Evaluation of the Health Insurance Fund Program in Central Kwara State, Nigeria

2014 – J van der Gaag, et al. A Medium-Term Impact Evaluation of a Health Insurance Fund Program in Central Kwara State, Nigeria.

### Other Reports

2007 – J van der Gaag – Impact Evaluation of the Health Insurance Fund Projects

2008 – E Gustafsson-Wright and J van der Gaag-Analysis of Nigeria's Health Sector by State-Recommendations for expansion of the Hygeia Community Health Plan



- 2008 – F Wit and C Schultsz – Report on the In-Clinic Research within Clinics participating in the Health Insurance Fund Project Nigeria 2007
- 2009 – J Lammers, et al. Focus Group Discussions On the Community Health Plan in Nigeria: Lagos and Kwara I (North)
- 2010 – J Lammers, et al. Eligibility Study Lagos
- 2010 – Kenya Report on the Mapping of Education Facilities in Kenya
- 2010 – Kenya Report on the Mapping of Health Care Facilities in Kenya
- 2011 – E Gustafson-Wright, et al. The Potential Market for Private Low-Cost Health Insurance in 4 African Contexts
- 2011 – F Wit and C Schultsz – Report on the In-Clinic Research within Clinics participating in the Health Insurance Fund Project Nigeria 2007-2010
- 2012 – E Gustafson-Wright, et al. Burden of Chronic Disease on Households in Tanzania and Kenya: Evidence from Health Insurance Fund Operational Research
- 2012 – F Wit and C Schultsz – Report on the In-Clinic Research within Clinics participating in the Health Insurance Fund Project Nigeria 2007-2011
- 2013 – D Brals, et al. Description Maternal and Child Health (MACH) in Rural Kenya, Nigeria, Tanzania & Potential for Health Insurance Program to Improve MACH
- 2013 – E Gustafsson-Wright, O Schellekens – Achieving universal health coverage in Nigeria one state at a time: a public-private partnership community-based health insurance model
- 2013 – N Rosendaal, et al. Predictors for Treatment Success in Cardiovascular Disease Prevention Care: Recommendations for the Hygeia Community Health Care program management based on results from the Quality Improvement Cardiovascular care Kwara-I study
- 2013 – G Gomez, et al. Estimating maternal care costs within the HCHP in rural Nigeria: a hospital-based study
- 2013 – N Rosendaal, et al. Costs of cardiovascular disease prevention care and budget impact for the Hygeia Community Health Care program in Kwara, Nigeria
- 2013 – F Lambrechtsen, et al. Costs of care for common febrile illnesses in rural Nigeria and budget impact for the Hygeia Community Health Care program
- 2013 – F Lambrechtsen, et al. Health service activities and cost items for common surgeries within the Hygeia Community Health Care Program

2013 – F Lambrechtsen, et al. Comparison of Costs for Cardiovascular Disease Prevention, Maternal Care, and Care for Febrile Illnesses: Budget impact for the Hygeia Community Health Care program

2014 – D Brals, et al. The impact of health insurance and medical facility-upgrades on institutional delivery among women in rural Nigeria

2014 – D Brals, et al. The Effect of Health Insurance and Medical Facility-Upgrades on Antenatal Care Utilization among Women in Rural Nigeria: a Population-Based Study

2014 – A Boers, et al. USAID LEADER AWARD Summary report on year studies

2014 – M Hendriks, et al. Strengthening Healthcare Systems for the Prevention of Chronic Diseases in Rural Nigeria\_Cardiovascular disease prevention in the Kwara State Health Insurance program

2016 – M van der List, et al. Healthcare initiatives in Nandi County: how do dairy farmers and their families make use of different healthcare initiatives, including The Community Healthcare Plan?

2016 – H Nelissen, et al. Evaluation of The Community Healthcare Plan in Nandi North, Kenya: Enrolment and Dropout

2016 – D Brals, et al. The Impact of The Community Healthcare Plan, National Health Insurance Fund, and the Free Maternal Care Program on Maternal and Child healthcare utilization in Rural Kenya: A Population-Based Study

2016 – C Elbers. Summary report of the main findings of the three evaluation studies on the TCHP Plan

2014 – TM Akande, et al. Kwara Health Insurance Re-Enrollment & Enrollment Suspension: Effect on Health Care Utilization and Coping Mechanisms (University Of Ilorin Teaching Hospital, Ilorin, Nigeria)

### **Published articles**

Odusola, A. O., Hendriks, M., Schultsz, C., Stronks, K., Lange, J., Osibogun, A., Akande, T., Alli, S., Adenusi, P., Agbede, K., & Haafkens, J. (2011). Development and evaluation of a patient centered cardiovascular health education program for insured patients in rural Nigeria (QUICK-II). *BMC public health*, 11(1), 171.

Hendriks, M., Brewster, L., Wit, F., Bolarinwa, O. A., Odusola, A. O., Redekop, W., Bindraban, N., Vollaard, A., Alli, S., Adenusi, P., Agbede, K., Akande, A., Lange, L., & Schultsz, C. (2011). Cardiovascular disease prevention in rural Nigeria in the context of a community based health insurance scheme: QQuality Improvement Cardiovascular care Kwara-I (QUICK-I). *BMC public health*, 11(1), 186.

Willebrands, D., Lammers, J., & Hartog, J. (2012). A successful businessman is not a gambler. Risk attitude and business performance among small enterprises in Nigeria. *Journal of Economic Psychology*, 33(2), 342-354.

Hendriks, M. E., Wit, F. W., Roos, M. T., Brewster, L. M., Akande, T. M., de Beer, I. H., Schultsz, C., et al. (2012). Hypertension in sub-Saharan Africa: cross-sectional surveys in four rural and urban communities. *PLoS One*, 7(3), e32638.

Lammers, J., van Wijnbergen, S. J., & Willebrands, D. (2013). Condom use, risk perception, and HIV knowledge: a comparison across sexes in Nigeria. *HIV/AIDS (Auckland, NZ)*, 5, 283.

Nelissen, H. E., Hendriks, M. E., Wit, F. W., Bolarinwa, O. A., Osagbemi, G. K., Bindraban, N. R., Brewster, L. M., et al. (2014). Target organ damage among hypertensive adults in rural Nigeria: a cross-sectional study. *Journal of hypertension*, 32(3), 487-494.

Hendriks, M. E., Wit, F. W., Akande, T. M., Kramer, B., Osagbemi, G. K., Tanović, Z., Schultsz, C., et al. (2014). Effect of Health Insurance and Facility Quality Improvement on Blood Pressure in Adults with Hypertension in Nigeria A Population-Based Study. *JAMA internal medicine*, 174(4), 555-563.

Hendriks, M. E., Kundu, P., Boers, A. C., Bolarinwa, O. A., te Pas, M. J., Akande, T. M., Tan, S. S., et al. (2014). Step-by-step guideline for disease-specific costing studies in low-and middle-income countries: a mixed methodology. *Global health action*, 7.

Hendriks, M. E., Bolarinwa, O. A., Nelissen, H. E., Boers, A. C., Gomez, G. B., Tan, S. S., Schultsz, C., et al. (2014). Costs of cardiovascular disease prevention care and scenarios for cost saving: a micro-costing study from rural Nigeria. *Journal of Hypertension*, 32, 000-000.

Hendriks, M. E., Bolarinwa, O. A., Wit, F. W., Brewster, L. M., Odusola, A. O., Rosendaal, N. T., Schultsz, C., et al. (2014). Feasibility and quality of cardiovascular disease prevention within a community-based health insurance program in rural Nigeria: an operational cohort study. *Journal of Hypertension*, 32, 000-000.

Odusola, AO, et al. (2014). Perceptions of inhibitors and facilitators for adhering to hypertension treatment among insured patients in rural Nigeria: a qualitative study. *BMC health services research* 14.1 (2014): 624.

Odusola, A.O., Nelissen, H., Hendriks, M., et al. (2015) How Group-Based Cardiovascular Health Education Affects Treatment Adherence and Blood Pressure Control among Insured Hypertensive Nigerians: A Pre-Test, Post-Test Study. *World Journal of Cardiovascular Diseases*, 5, 181-198.

Gomez GB, Foster N, Brals D, Nelissen HE, Bolarinwa OA, Hendriks ME, et al. (2015) Improving Maternal Care through a State-Wide Health Insurance Program: A Cost and Cost-Effectiveness Study in Rural Nigeria. PLoS ONE 10(9): e0139048. doi:10.1371/journal.pone.0139048.

I Bonfrer, et al. (2015) Effects of a subsidized voluntary health insurance on insured and uninsured in Nigeria (BMG Working Paper 2015.01)

Hendriks, M.E., Rosendaal, N.T., Wit, F.W., Bolarinwa, O.A., Kramer, B., Brals, D., Gustafsson-Wright, E., Adenusi, P., Brewster, L.M., Osagbemi, G.K. and Akande, T.M., 2016. Sustained effect of health insurance and facility quality improvement on blood pressure in adults with hypertension in Nigeria: A population-based study. *International journal of cardiology*, 202, pp.477-484.

Aina O. Odusola, Karien Stronks, Marleen E. Hendriks, Constance Schultsz, Tanimola Akande, Akin Osibogun, Henk van Weert and Joke A. Haafkens (2016). Enablers and barriers for implementing high-quality hypertension care in a rural primary care setting in Nigeria: perspectives of primary care staff and health insurance managers. *Glob Health Action* 2016, 9: 29041.

Ignia Bonfrer & Emily Gustafsson-Wright (2016): Health shocks, coping strategies and foregone healthcare among agricultural households in Kenya, *Global Public Health*, DOI: 10.1080/17441692.2015.1130847.

Janssens, W., Kramer, B., (2016). The social dilemma of microinsurance: Free-riding in a framed field experiment. *J. Econ. Behav. Organ.* <http://dx.doi.org/10.1016/j.jebo.2016.03.003>

Rosendaal NTA, Hendriks ME, Verhagen MD, Bolarinwa OA, Sanya EO, et al. (2016) Costs and Cost-Effectiveness of Hypertension Screening and Treatment in Adults with Hypertension in Rural Nigeria in the Context of a Health Insurance Program. PLoS ONE 11(6): e0157925. doi: 10.1371/journal.pone.0157925

Janssens W, Goedecke J, de Bree GJ, Aderibigbe SA, Akande TM, Mesnard A (2016) The Financial Burden of Non-Communicable Chronic Diseases in Rural Nigeria: Wealth and Gender Heterogeneity in Health Care Utilization and Health Expenditures. PLoS ONE 11(11): e0166121. doi:10.1371/journal.pone.0166121

Wendy Janssens, Berber Kramer and Lisette Swart, (2017) Be Patient When Measuring Hyperbolic Discounting: Stationarity, Time Consistency and Time Invariance in a Field Experiment, *Journal of Development Economics*, <http://dx.doi.org/10.1016/j.jdeveco.2016.12.011>

Odusola, A. O., Stronks, K., Schultsz, C., Hendriks, M., Bolarinwa, O. A., Akande, T., ... & Haafkens, J. (2017). Development of a cardiovascular health education program for primary care patients with hypertension in rural Nigeria: a qualitative study. *Health Education and Care*, 2(1). doi: 10.15761/HEC.1000113

Daniëlla Brals, Sunday A Aderibigbe, Ferdinand W Wit, Johannes C M van Ophem, Marijn van der List, Gordon K Osagbemi, Marleen E Hendriks, Tanimola M Akande, Michael Boele van Hensbroek, Constance Schultsz; The effect of health insurance and health facility-upgrades on hospital deliveries in rural Nigeria: a controlled interrupted time-series study. *Health Policy Plan* 2017 czx034. doi: 10.1093/heapol/czx034

Emily Gustafsson-Wright, Gosia Popławska, Zlata Tanović, Jacques van der Gaag, (2017) The Impact of Subsidized Private Health Insurance and Health Facility Upgrades on Healthcare Utilization and Spending in Rural Nigeria. *International Journal of Health Economics and Management*. (Forthcoming)

Sunday A. Aderibigbe, Daniëlla Brals, Ferdinand W. Wit, Gordon K. Osagbemi, Tanimola M. Akande, Constance Schultsz, Michael Boele van Hensbroek; Effect of Health Insurance and Health Facility Improvements on Birth Weight and Infant Health Care Utilisation in Rural Nigeria. (Forthcoming)

Daniëlla Brals, Sunday A. Aderibigbe, Maurice Bun, Ferdinand W. Wit, Menno P. Pradhan, Job C.J. Calis, Tanimola M. Akande, Constance Schultsz, Michael Boele van Hensbroek; The effect of health insurance and healthcare facility-upgrades on nutritional status of children in rural Nigeria: A Longitudinal Study. (Forthcoming)

### Discussion Papers

Lammers, J., Willebrands, D., & Hartog, J. (2010). *Risk Attitudes and Profits among Small Enterprises in Nigeria* (No. 10-053/3). Tinbergen Institute Discussion Paper.

Lammers, J., Warmerdam, S., & Ecorys, R. (2010). Adverse selection in voluntary micro health insurance in Nigeria. *University of Amsterdam, Amsterdam Institute for International Development, AIID Research Series*, 10-06.

Lammers, J., Van Wijnbergen, S., & Willebrands, D. (2011). *Gender differences, HIV risk perception and condom use* (No. 11-051/2). Tinbergen Institute Discussion Paper.

Boermans, M., & Willebrands, D. (2012). *Financial Constraints, Risk Taking and Firm Performance: Recent Evidence from Microfinance Clients in Tanzania*. DNB W.

### PhD Theses Chapters

Velenyi, E. V. (2011). *Modeling demand for community-based health insurance: an analytical framework and evidence from India and Nigeria* (Doctoral dissertation, University of York).

Hendriks, M. (2014). *Cardiovascular disease prevention in a health insurance program in rural Nigeria* (Academic thesis, University of Amsterdam, The Netherlands).

Kramer, B. (2015) Why don't they take a card?: Essays on the demand for micro health insurance (Doctoral thesis, VU University, Amsterdam).

Bonfrer, I. (2015) – Evaluating Health care Financing Reforms in Africa (Doctoral thesis, Erasmus University Rotterdam, The Netherlands).

Odusola, A.O. (2015) Development and evaluation of a cardiovascular health education program among insured patients with hypertension in rural Nigeria (Academic thesis, University of Amsterdam, The Netherlands).

### **MSC Theses**

List, M. v. d. (2010). Culture and its effect on development programs. A case study in Nigeria (MSc thesis, University of Amsterdam, Amsterdam).

Grinkevicuite, A. (2011). WTP–Why to pay: Understanding incentives of willingness to pay for health insurance among poor households in Nigeria (MSc Thesis, VU University, Amsterdam).

Weldensae, F. (2012). The Determinants of Internal Migration: Evidence from Kwara, Nigeria (MSc Thesis, City university, London).

Goedecke, J. (2012 ). The Impact of Chronic Diseases on Labor Market Outcomes in Kwara State, Nigeria (MSc thesis, VU University, Amsterdam).

Swart, L., et al. (2012). Irrational Financial Decision Making: Evidence from a Field Experiment in Rural Nigeria (MPhil thesis, Tinbergen Institute, Amsterdam).

Nelissen, H.E., (2013). Literature review on factors related to (re-)enrollment and strategies to increase (re-)enrollment in health plans in SSA (MSc Thesis, University of Amsterdam, Amsterdam).

Bergh, N. v. d., (2013). Impact of offering health insurance on chronic illness related expenditures in Kwara State, Nigeria (MSc Thesis, University of Amsterdam, Amsterdam).

Matthew Hardy (2014). Illness, bargaining and healthcare: Healthcare decisions within households in Kwara, Nigeria (MSc thesis, VU University, Amsterdam).

Suzanne Naomi Hofstee (2014). Informal Firm Owners and Shocks in Developing Countries: An Empirical Investigation of a Household-Firm Model in Nigeria (MSc thesis, VU University, Amsterdam).

Ilja Hermans (2014). Measurement of income patterns based on subjective expectations (MSc thesis, VU University, Amsterdam).

Julius Ohrnberger (2014). Of farmers and prospect theory – A behavioural economic analysis of agricultural investment in Nigeria (MSc thesis, VU University, Amsterdam).



Vera Ide (2014). Shocks, remittances, insurance and m-peas: evidence from westerns Kenya (MSc thesis, VU University, Amsterdam).

Arno de Jager (2014). Economic impacts of illness, coping strategies, health insurance and crowding-out effects: dynamic evidence from a financial diary survey in Nigeria (MSc Thesis, University of Amsterdam, Amsterdam).

Siebelink, L., (2015). The effect of health insurance on the utilization of formal health care in rural Nigeria (MSc Thesis, VU University, Amsterdam).

Wubs, E., et al. (2015). Factors influencing decision for home- or facility-based delivery after implementation of Free Maternal Care in Nandi County, Kenya (MSc Thesis, University of Amsterdam, Amsterdam).

Max Markrich (2017). Evaluating the Distributional Effect of Access to Health Insurance on Household Medical Expenditures: Evidence from a Health Insurance Fund Program in Kwara State, Nigeria (MSc thesis, VU University, Amsterdam).





