MILK Brief #24:
"Doing the Math" – Health Insurance and Chronic Disease in Nigeria[1]

Studying the Hygeia Community Health Care Plan in Lagos

Like many rapidly growing cities in the developing world, the teeming city of Lagos, Nigeria is facing ever-rising rates of chronic disease. As urbanization often comes hand-in-hand with sedentary lifestyles, unhealthy diets and high stress levels, residents in Lagos are increasingly at risk for hypertension and other lifelong medical conditions. A 2012 study in a Lagos slum found 38.2% of adults to be hypertensive (Olusoji, et al.).

For Lagos's poor, a diagnosis of hypertension carries a second burden: a lifetime of expensive drugs, tests and hospital visits. Hygeia Community Health Care (HCHC) seeks to alleviate these costs by extending health insurance to low-income individuals in Lagos. Born out of a partnership between the PharmAccess Foundation, the Health Insurance Fund and the Nigerian HMO and hospital group, Hygeia Nigeria Limited, HCHC has offered health insurance to traders and small to medium enterprise owners in Lagos since 2007. Simultaneously, PharmAccess has invested in HCHC network hospitals through the Medical Credit Fund and the SafeCare initiative, which, respectively, offer loans and certification to clinics based on stepwise improvements in quality according to clinical standards. Additionally, PharmAccess supported the insurance program through a direct premium subsidy of 86% during the period January 2012 through March 2013 (the period of the study). Beginning in April 2013 the subsidy was reduced to 75%. By **reducing costs** and **improving quality of care**, the product seeks to facilitate better health outcomes for low-income families in Lagos.

A team from the MicroInsurance Centre's MILK Project traveled to Lagos in February and March of 2013 to analyze the value of the HCHC product for clients with chronic disease, specifically hypertension. The team implemented MILK's Client Math methodology[2] to quantify the product's financial value by (1) comparing the costs of hypertension management between insured and uninsured respondents and (2) unpacking the strategies used to finance these costs. We focused on outpatient chronic disease management, including direct costs of clinic visits, diagnostic testing and drugs, as well as indirect behavior changes such as exercise, dietary changes and regular adherence to a drug regimen. Because of its complexity and duration, it is often difficult to assign a financial cost to chronic disease, but doing so has important consequences for understanding client value in terms of both financial savings and health outcomes.

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[1] This MILK Brief was prepared by Laura Budzyna, Taara Chandani and Barbara Magnoni (August 2013).
[2] See MILK Brief #9, "What is Client Math?" (April 2012).

This study came on the heels of our previous client value study of the KNCU health plan in Tanzania, which focused on respondents covered by a comprehensive outpatient health insurance product. We interviewed patients who had suffered from acute, communicable illnesses such as malaria, pneumonia and bronchitis and were treated with exams, drugs and care at the outpatient level. We found that insured clients not only had far lower health costs than the uninsured for similar illnesses, but they also sought outpatient care more quickly after becoming ill than uninsured respondents.[3] We hypothesize that the comprehensive nature of the coverage reduces uncertainty and costs associated with going to the doctor, and thus incentivizes patients to go sooner. In Nigeria, we wanted to better understand whether coverage of chronic illness would similarly incentivize patients to seek more frequent care.

PharmAccess, a Dutch non-profit organization, works to improve access to quality health care in Africa through private health insurance for low and middle-income groups.

PharmAccess subsidized roughly 86% (now 75%) of HCHC member premiums. It is simultaneously working to improve the quality of the facilities that are selected in the Health Plan by funding comprehensive infrastructure improvements. These improvements include the redevelopment of facilities, the training of medical staff, and work to ensure sufficient supplies of medications. Finally, PharmAccess supports HCHC on marketing, administrative systems, health intelligence, package design and optimization.

We found that HCHC clients use preventative hypertension services more frequently and consistently than uninsured respondents, and they have made more lifestyle changes than the uninsured comparison group. This suggests that the insurance has reduced barriers to access and played a role in facilitating healthy behavior change. To compound this benefit, HCHC clients also face dramatically lower costs of treatment and services, though their opportunity cost of seeking care remains the same as it does for uninsured clients. At the same time, we find that the lifestyle changes that insured clients have undertaken, specifically dietary changes, have resulted in new and unforeseen non-medical costs for this group. This sheds light on the consideration that in some cases, by virtue of their more frequent contact with the health system, insured individuals actually spend more on their health than do uninsured individuals.[4] These expenses are important to quantify as they can lead to improved health outcomes but can also discourage short-term usage of health services.

Hygeia Community Health Care: How it Works

HCHC is a voluntary health insurance product available to traders in ten Lagos markets. For a small annual premium, enrollees have cashless access to a wide range of primary and secondary care services from one of sixteen network providers in the city. For members with chronic conditions such as hypertension, this premium covers all related testing and medications, as well as any necessary hospitalization. At the time of the study, the annual co-premium paid by an individual HCHC member was NGN 2000, or **USD12**.[5]

To date, over 23,000 people are enrolled in HCHC under the Lagos Market Women scheme, with an annual renewal rate of around 52%. Of these, 3400 clients are hypertensive.[6] All HCHC network hospitals assign a specific day of the week for a hypertension clinic, during which clients attend an educational seminar, receive a blood pressure test, collect their medication and consult with the doctor on an as-needed basis.

HCHC pays its network hospitals on a capitation basis. The base capitation paid to hospitals is USD3.80 per person per month. In addition, HCHC compensates hospitals for high drug costs of chronic patients on a Fee for Service (FFS) basis: for each visit, the hospital receives an additional USD8.50 for complicated cases and USD4.95 for uncomplicated cases. Additionally, HCHC pays hospitals a laboratory fee of USD9.85 up to three times per year for complicated cases and once per year for uncomplicated cases.

[3] See MILK Brief #22, "Doing the Math: Outpatient Health Insurance in Tanzania" (April 2013).
[4] Wagstaff, A., & Lindelow, M. (2008). "Can insurance increase financial risk? The curious case of health insurance in China." *Journal of Health Economics, 27,* p. 990–1005.
[5] In April 2013 the co-premium increased to USD22, but the total premium remained unchanged (resulting in a lower premium subsidy).
[6] Source: Diederik van Eck, Actuarial analyst, PharmAccess Foundation, June, 2013

The hospitals that are networked with HCHC all participate in the SafeCare initiative, a stepwise certification and quality improvement program for health facilities.[7] Providers mentioned this initiative as being one of the major benefits of belonging to the HCHC network. Many providers were motivated to join because of the potential to upgrade their facilities, earn brand recognition and access financing[8] to make capital improvements – all in addition to expanding their clientele. Under the SafeCare Initiative, providers have improved their clinical and management processes as well as invested in infrastructure. For example, facilities have started to publicly display patient rights, standardize audits, build capacity of medical and non-medical staff, improve infection control systems and establish laboratories.

As a result, through HCHC and SafeCare, the PharmAccess Foundation is simultaneously lowering cost barriers to clients and improving their quality of care. This strategy not only provides immense value to clients, but it is also an innovative way to build up demand for health insurance in a market with previously limited awareness of its advantages.

Methodology

Our study centered on the following research questions:

- How does the **utilization** of hypertension services differ between insured and uninsured market vendors?
- How do the **costs** of hypertension management differ between the two groups?
- What **financing strategies** do insured and uninsured vendors use to cope with these costs? Does HCHC add value over other strategies?

The survey instrument catalogued all activities and costs that the respondent had incurred from hypertension over the past **three months**, including clinic visits, drug purchases, tests, transportation and lifestyle changes.[9] It then registered all the methods that respondents had used to pay for these costs. This instrument was refined first with the help of PharmAccess and again after a pilot test in Daleko Market.

With the help of IPSOS, a Lagos-based survey firm, our team interviewed 62 respondents: 31 insured under the HCHC plan, and 31 uninsured. All respondents were traders with shops in the Mushin and Agege districts of Lagos, and all had hypertension that was being actively treated. Insured respondents were contacted in advance and interviewed in Daleko Market and at two HCHC network facilities. Uninsured respondents were identified in Mushin Main Market and Awolowo Market with the help of two local nurses. All data was collected on smartphones using Open Data Kit and later analyzed using Excel and Stata 12 software.

Who were the respondents?

As the study targeted hypertensive individuals with similar demographics to those in the HCHC market vendor client pool, most respondents were women over the age of 50. The majority of respondents were business owners, with just four insured respondents who had recently retired and one uninsured respondent who was a shop employee. Respondents ran fairly well-stocked shops, with concrete structures and a license to operate in a zoned market. Over 70% worked in trade, selling provisions, foodstuffs or clothing. Others worked in services or manufacturing, such as sewing or carpentry. Overall, 65% of respondents were the main breadwinners in their households.

[7] The SafeCare Initiative is a partnership between the Joint Commission International (JCI), the PharmAccess Foundation, and the Council for Health Service Accreditation of Southern Africa (COHSASA).
[8] PharmAccess Foundations' Medical Credit Fund provides network hospitals with access to credit.
[9] In some cases, respondents were also hospitalized, which was captured in the surveys.

Though they were interviewed in similar markets, we found that in many respects, the insured respondents were more established and stable than the uninsured respondents (see Table 1). The insured group was slightly older with higher levels of education, rates of homeownership and rates of marriage, making them somewhat less vulnerable than the uninsured group. This may be a result of Hygeia's strategy of targeting registered markets with licensed traders.

Table 1: Socioeconomic Characteristics of Respondents

	Insured (n=31)	Uninsured (n=31)	p[10]
Age	59.5	53.5	0.018
% Female	74%	81%	0.544
Years of education	9.5	6.9	0.059
Household size	6.0	4.6	0.060
% Married	84%	71%	0.572
% Own home	61%	35%	0.057
% Own business	84%	97%	0.356
Monthly Income (of earners)[11]	USD 145	USD 174	0.502
Monthly Household Expenses	USD 365	USD 402	0.682

How do they manage their hypertension?

Before we could directly compare costs of hypertension, we first needed to understand how insured and uninsured respondents differed in their usage of hypertension services over a three-month period. We found that HCHC clients display more frequent and consistent health-seeking behaviors, which suggest better health outcomes for this group.

Utilization Overall, the insured HCHC clients seek hypertension-related care more frequently than uninsured respondents. In the preceding three months, insured respondents had consulted with medical providers more frequently than uninsured respondents (3.2 times vs. 1.6 times). In addition, insured clients had tested their blood pressure more regularly (3.1 times vs. 1.7 times). Because HCHC network hospitals host educational sessions on hypertension clinic days, insured clients also attended hypertension workshops more frequently (1.3 times vs. 0.3 times). This increased health-seeking behavior is likely because the insured were able to access health services during the same visit with no upfront payment.

Drug Adherence HCHC clients reported better adherence to their hypertension medications than uninsured respondents. Insured respondents were significantly less likely than uninsured to report that they had missed a dosage or stopped taking medication in the last three months (21% vs. 43%). The insured respondents who missed were more likely to report that they had forgotten, while uninsured respondents largely reported that they stopped because they "felt better." The latter reflects a conscious decision, suggesting perhaps that there was misinformation (i.e. the perception that hypertension drugs could safely be taken irregularly on an as-needed

[10] A p-value below 0.05 indicates a statistically significant difference between the two groups.

[11] Most respondents were unable to report on the incomes of other adults in their household. We have estimated individual monthly incomes based on typical daily profits, and we have included clients' estimates of their monthly household expenses to arrive at an estimated figure for household income.

basis) or a desire to avoid a cost that they perceived as unnecessary. Three uninsured respondents said simply that they stopped medication because they could not pay for it.

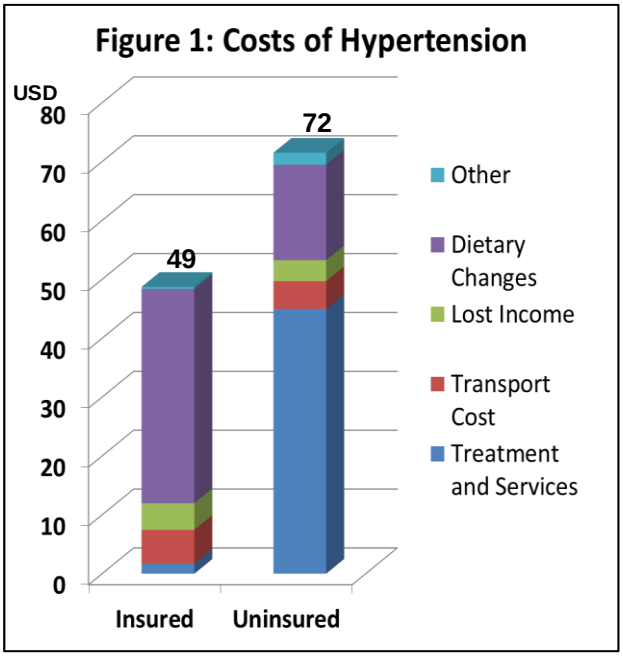
Facilities Insured respondents receive most hypertension services at a single HCHC network hospital, while uninsured respondents cobble together care at a more heterogeneous group of facilities. For instance, many uninsured respondents obtained their drugs at a pharmacy or chemist, consulted with doctors at a government facility, and tested their blood pressure at community health checks or in the market itself. While insured clients had the convenience of obtaining all services in a "one-stop shop" model, uninsured clients attempted to minimize costs by seeking care through multiple channels.

Lifestyle Changes Although we found that both groups had similar knowledge of the types of lifestyle changes that are advisable for hypertensive patients, insured respondents were significantly more likely to have implemented these changes. In particular, insured respondents were more likely to have changed their diet (84% vs. 65%), to exercise (52% vs. 32%), and to have increased their hours of sleep (58% vs. 35%) than uninsured respondents. Notably, significantly more uninsured than insured respondents report that they have made no lifestyle changes since their diagnosis (13% vs. 3%).

Taken together, these trends suggest better health outcomes for insured patients in the long run.

How much did it cost?

Over a period of three months, insured respondents spent an average of **USD49** for the direct and indirect costs associated with their hypertension, while uninsured respondents spent **USD72** (see Figure 1). The difference in ***direct treatment costs*** is perhaps the most striking: even though their utilization was lower, uninsured respondents spent over 25 times as much as insured clients did on medicine, tests and consultations. On the other hand, it appears that insured clients are incurring substantial ***indirect costs***. In particular, insured respondents spent over twice as much as uninsured clients on dietary changes as a result of their hypertension. This suggests that insurance may play a role in behavior change but that behavior change comes with its own costs to the individual.



Treatment and Services For individuals with hypertension, the cost of medicine, testing and regular consultations with health professionals can be burdensome. For uninsured respondents, we found this to be true: on average, uninsured respondents spent **USD45** on their treatment over the course of three months. Insured clients, whose treatment costs were covered by HCHC, spent just **USD1.70** on treatment over the same period.[12] The uninsured paid more out of pocket than the uninsured by a factor of 27: a clear illustration of the tremendous savings that HCHC offers to clients.

Drugs accounted for nearly 80% of the treatment cost for the uninsured, amounting to USD35 over three months. The high price tag of hypertension drugs partially explains the lower drug adherence among uninsured respondents. Testing comprised USD7.80 of the cost, and consultation fees added USD1.70 to the total cost of treatment.

[12] Though we would expect this number to be zero because HCHC covers all treatment costs, some insured respondents had sought services through a facility outside of the HCHC network.

Transport For the majority of residents in the sprawling city of Lagos, visiting a clinic or pharmacy also means paying for public transportation. Both insured and uninsured respondents faced this cost, averaging USD1.70 (uninsured) and USD2.00 (insured) per trip. Total transport costs did not differ significantly: insured respondents paid **USD5.80** and uninsured respondents spent **USD4.70** on transport to hypertension services over the course of three months.

Lost Income Market vendors face substantial opportunity costs when leaving their stall for several hours at a time in order to visit health facilities. Over the course of three months, respondents reported losing approximately one day's work: 8 hours for insured respondents and 9.3 hours for uninsured respondents. Using an hourly wage based on respondents' reported daily profits, these lost hours translate to **USD4.50** in lost income for insured respondents and **USD3.60** for uninsured respondents over that period. Relatedly, many insured respondents reported long wait times at HCHC clinics; as a result of these waits, a few insured clients opted to buy medicine and pay for blood pressure tests closer to home. HCHC does not seem to reduce the opportunity cost for its clients.

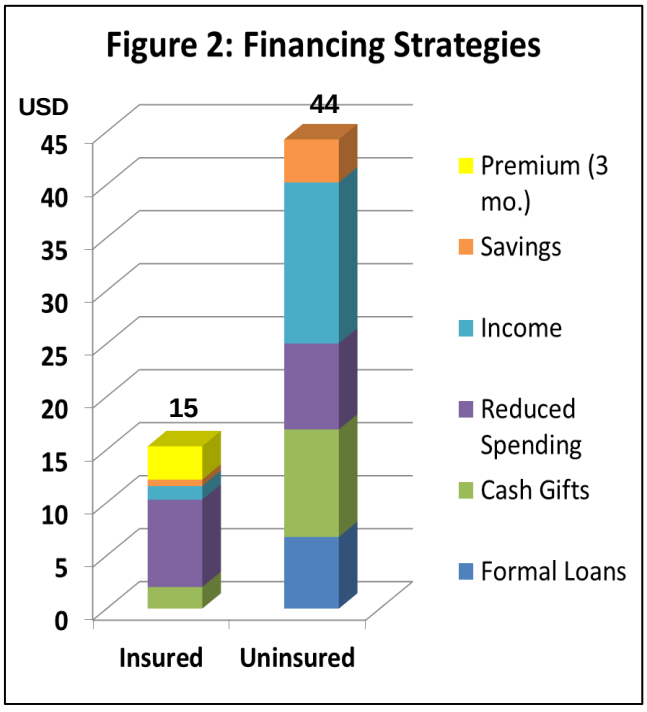
Dietary Changes It can be costly to change one's diet, especially as fresh fruits and vegetables are often more expensive than grains and sugars or highly processed foods. 35% of insured respondents and 19% of uninsured respondents reported that they now spend more on food than they did before their diagnosis. By asking respondents their weekly food expenses before and after this dietary change, we calculated that, on average, insured clients spend **USD36** more over the course of three months than they did before changing their diet. Uninsured clients spend less than half that amount: just **USD16** more than before the change.

This noteworthy finding suggests two things: first, that having insurance may play a role in healthy behavior change; and second, that in some cases, insured people spend more on health than uninsured individuals by virtue of their higher access to care and information.

Other Costs 16% of insured and 23% of uninsured respondents reported buying **herbs** for their hypertension to supplement their drugs. This cost was minimal, averaging just **USD0.30** for the insured and **USD2.00** for the uninsured.

How did they pay for it?

As expected for a group of business owners managing recurrent costs, **income** was the most common strategy used by respondents to pay for hypertension-related expenses (see Figure 2). Loans, gifts, and savings were much less popular by comparison; this is likely because these non-recurring financial strategies are not very effective for managing the everyday expenses of chronic illness. However, we found that while income was the strategy that best matched the timing of expenses, it was insufficient by itself. For many uninsured respondents, it became necessary to resort to less efficient methods to cover their costs.



Because their costs were so low, insured respondents reported using fewer financing strategies and financed substantially less than the uninsured. In fact, 45% reported that they did not need to use any financing strategy other than the premium to pay for hypertension costs. This is somewhat contradictory to the fact that insured clients still faced transport, opportunity and

dietary costs. Our assumption is that insured respondents did not distinguish these non-medical expenses from normal household expenses and paid for them using household income. It is noteworthy that the premium paid by insured clients makes up only a fraction of the total cost that uninsured clients had to bear on their own – another illustration of the immense savings that Hygeia provides to clients.

Income As is expected for recurrent health care costs, income was the most common method used by respondents to finance their hypertension expenses. Overall, 39% of insured and 58% of uninsured respondents report using their own earnings to pay for these costs. The actual amount of income used, however, was small in comparison to the costs of care. On average, uninsured respondents used only **USD15** of their own income to pay for three months of care; insured respondents only used **USD1.30** (though, as we mentioned before, we expect that some additional transportation costs and costs of dietary changes may have been funded with normal household income). This suggests that ***income is insufficient to cover the full costs of chronic health care***, and market vendors require other strategies to meet this recurrent financial need.

Loans Borrowing was not a common source of health care funding in this sample: just four uninsured respondents borrowed to cover their hypertension costs, and no insured client did. The recurring nature of chronic health care expenses makes this strategy unappealing and inefficient for most. However, where we have seen that income could not meet the need, a few individuals took out large loans to help stem the outpouring of money toward health care expenses. These loans were very large, averaging USD473. In fact, in three out of four of these cases, the loan value was over ten times the cost of hypertension management. We suspect that the majority of this money was not used for hypertension management, but rather that hypertension was one of the main motivators for taking out a loan. Because it is unrealistic to believe that these loans were exclusively financing health expenses, and because they skew the averages tremendously, they have been omitted from Figure 2 above.

Gifts Some respondents were able to count on cash support from family or friends to help pay for their hypertension costs: 19% of uninsured and 10% of insured received such transfers to pay for these costs. This averaged to **USD2** for insured and **USD10** for uninsured. In the cases where market vendors had grown children who were able to provide support, cash gifts played an especially important role. Nonetheless, the average size of these gifts barely scratched the surface of the overall costs faced by the respondents.

Reduced Spending Surprisingly few respondents cut their consumption in order to manage health care costs: just 6% of insured and 13% of uninsured report reducing their spending. Of these, the largest cuts were in the realm of entertainment and indulgences: respondents report cutting drinking, smoking and going to social events. Only two respondents – one insured and one uninsured – cut back on food expenses, and one insured respondent reported spending less on education. Overall, these cuts averaged **USD8** for both groups.

Savings Only 3% of insured and 10% of uninsured used savings to pay for their hypertension costs, averaging to just **USD0.60** and **USD4.10** over the course of three months. This is less of a reflection of actual savings behavior (half of both groups report having savings) than of the usefulness of savings as a means for covering chronic costs.

Hospitalization Costs: Paying for Extra Care

Five respondents - three insured and two uninsured - had been hospitalized for hypertension complications in the previous 12 months. These individuals faced additional expenses over and above the routine costs of hypertension management. While these costs are not incorporated in the analysis above, it is instructive to take a closer look at the breakdown of the costs that these individuals faced.

As expected, both uninsured respondents paid out of pocket for all fees related to their consultation and stay, as well as tests, medicines and supplies, averaging **USD175** over the course of their treatment.

We saw more variability in the HCHC clients' hospitalization costs. One client did not spend any money out of pocket: HCHC covered her hospitalization completely. The second client had the majority of his hospitalization covered but paid an extra USD158 to see a specialist and spent USD75 on food during his stay. The third HCHC client appears to have chosen an out-of-network hospital: like the uninsured respondents, she paid USD73 out of pocket for all fees, medicines, tests and supplies. On average, the three insured clients paid **USD102** out of pocket during their hospitalization – more than might have been expected given their coverage.

Although the hospitalization itself lasted less than 7 days on average, these respondents reported missing on average 34 days of work during their illness, hospitalization and recovery. Unable to earn income during this period, these individuals suffered significant opportunity costs: **USD113** for insured clients and **USD95** for uninsured respondents.

Was it worth it?

By providing dramatic cost savings as well as promoting increased utilization and improved quality of health care, HCHC offers clear value to clients with chronic illness. It is important to remember, however, that clients themselves are not paying the full cost of the product: PharmAccess fronted 86% of the premium (75% starting in April 2013). While this subsidy makes the product very difficult to replicate, it does have a few advantages. First, it may help to expand the market by offering these clients the opportunity to "sample" insurance at low cost. Second, by offering insurance to a community that formerly had none, it has also allowed researchers to observe the ways in which insurance can influence these clients' finances and health behaviors for the better. PharmAccess notes that they are currently redesigning the program without a subsidy (in the long-term) which should facilitate replication.

HCHC offers tremendous savings to its clients for direct health care costs. In a typical year, HCHC clients spend just USD12 on the premium, while uninsured respondents spend over three times that amount out-of-pocket on the equivalent drugs, tests and consultations. Even with the increase of the premium to USD22, uninsured respondents still outspend the premium by a factor of 2 on treatment alone. Clients perceive the financial benefit to be obvious: 94% report that the feature they value most about HCHC is that they save money. Moreover, 55% say that the price is reasonable and another 42% call it "cheap" or "very cheap."

The simultaneous implementation of SafeCare is an advantage for hospitals and clients alike. In interviews, nearly all providers identified SafeCare as a key advantage of being a member of the HCHC network. Clients also perceived the high quality of medical services at HCHC network hospitals. A majority (65%) reported that having access to quality medical care is one of the features they value most about belonging to HCHC. Moreover, SafeCare can be considered a broader social benefit, as it extends not only to HCHC patients but to all Lagos residents who use partner facilities. As the SafeCare brand gains wider recognition at hospitals in Lagos, it has the potential to drive increased clientele as well as to give voice to clients to demand better customer care.

HCHC seems to promote higher health care utilization and healthy behavior change. By lowering cost barriers, HCHC facilitates more frequent provider visits, more regular testing and higher drug adherence. As we saw in Tanzania, the motivation to "use it or lose it" nudges patients to seek treatment rather than to wait or forego treatment. We note that a higher proportion of HCHC clients report making healthy lifestyle changes than uninsured respondents. Taken together, these behaviors will likely reduce long-term costs of chronic care.

New costs often arise when clients' health care management improves, potentially straining short-term finances but likely contributing to long-term health outcomes. We saw this especially with the increased spending on healthy foods among the insured respondents. This carries important implications for health policy and the use of insurance in behavior change, given the rising burden of chronic illnesses and their associated management and hospitalization costs.

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Microinsurance Learning and Knowledge (MILK) is a project of the MicroInsurance Centre that is working collaboratively to understand client value and business case in microinsurance. Barbara Magnoni leads the client value effort and Rick Koven leads the effort on the business case. Contact Michael J. McCord (mjmccord@microinsurancecentre.org), who directs the project, for more information.