Case Study

Leveraging HIV platforms to work toward comprehensive primary care in rural Malawi: the Integrated Chronic Care Clinic

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ABSTRACT

This case study describes an integrated chronic care clinic that utilizes a robust HIV program as a platform for NCD screening and treatment. A unique model, the integrated chronic care clinic provides longitudinal care for patients with an array of chronic diseases including HIV and common NCDs, allowing for a single visit for all of a patient’s conditions. Set in Malawi’s remote Neno District, this clinic structure aims to (1) increase access to care for NCD patients, (2) maximize efficiency given the severe human resource shortages, and (3) replicate strong HIV outcomes for patients with other chronic conditions. The goal is to increase the number of health facilities in Neno capable of fully delivering Malawi’s Essential Health Package, the set of cost-effective interventions endorsed by Malawi MOH to reduce burden of disease and leading causes of death.

While implementation is ongoing and processes are evolving, this model of healthcare delivery has already improved the accessibility of NCD care by allowing patients to have all of their chronic conditions treated on the same day at their nearest health facility, notably without additional investment of human and financial resources. Currently, 6781 patients on antiretroviral therapy and 721 patients with NCDs are benefitting, including 379 with hypertension, 187 with asthma, 144 with epilepsy, and 76 with diabetes. Among the NCD patient population, 15.1% are HIV-positive. Success hinged largely on several factors, including clear leadership and staff ownership of their specific duties, and a well-defined and uniform patient flow process. Furthermore, deliberate and regular conversations about challenges allowed for constant iteration and improvement of processes.

Moving forward, several tasks remain. We are refining the data management process to further consolidate medical records, along with integrating our tracking processes for clients who miss appointments. Additionally, we are exploring opportunities for further integration, including family planning. A follow-up patient satisfaction survey is planned for the coming months to track the impact of the clinic’s redesign.

Given limited human and financial resources, innovative solutions are required to address the growing burden of chronic disease in Malawi. We have found that an integrated, patient-centered approach maximizes efficiency and reduces barriers to care for the hardest to reach patients.

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1. Background

As non-communicable diseases (NCDs) make up an increasing proportion of the burden of disease worldwide, finding innovative models of care delivery that maximize existing resources is increasingly important. In Africa, NCDs are projected to become the leading cause of death by 2030, and in Malawi, hypertension and diabetes are already significant health problems, affecting 32.9% and 5.6% of the population, respectively. In fact, 93.3% of these
hypertensive patients are not even aware of their diagnosis. In 2010, NCDs were responsible for 21.4% of the DALYs, an increase from 17.5% in 1990. With an HIV prevalence of 10.6%, Malawi is thus facing a growing double burden of chronic diseases, both communicable and non-communicable.

The Malawi Ministry of Health has implemented a robust, progressive, and free-of-charge HIV program at the primary health care level throughout the country. For example, they led expansion of ARVs for life for pregnant women. The success of this program can be attributed to a number of factors, including strong international and national leadership, adequate funding, clear and standardized ART protocols supported with training, supervision and monitoring, and a very reliable supply chain. The HIV Program is strongly supported and directed from a central level within the MOH, whereas the NCD unit within the national MOH has three staff and is in the early days of creation of protocols, supervision, and training.

The Malawi government frames the delivery of primary health care around the Essential Health Package (EHP), which is the minimum package of services that should be available at the primary care level, covering conditions affecting the majority of the population with a focus on the poor. These include vaccine preventable diseases, acute respiratory infections, malaria, tuberculosis, sexually transmitted infections, HIV, diarrheal disease, malnutrition, perinatal conditions, and common injuries. In 2011, non-communicable disease treatment was added to the EHP. However, the successful incorporation of NCDs at the primary healthcare level has been limited: in Neno District, the district described here, only two hospitals of 13 health facilities claim complete EHP delivery, and NCDs comprise a significant gap in services.

Given that 51% of Malawi’s health care funding is directed toward HIV, whereas less than 1% is allocated for NCDs such as mental health, diabetes and cardiovascular disease, leveraging HIV programs for delivery of NCD care may be an effective strategy. There have been a number of attempts to combine HIV care with other specific clinical programs, as well as general primary care, with studies suggesting that integration may offer systemic- and patient-level benefits. Our literature review uncovered just one example of a fully-integrated HIV and NCD clinic. The study, which took place in Cambodia, describes an integrated model in which physicians and nurses received training in HIV and NCD management as well as patient-centered care, and all patient groups demonstrated satisfactory outcomes.

2. Organizational context

Partners In Health (PIH), an NGO known in Malawi by its Chichewa name Abwenzi Pa Za Umoyo (APZU), partnered with the Malawi Ministry of Health (MOH) in 2007 to strengthen health services in the rural and impoverished district of Neno. PIH’s mission is to create a preferential option for the poor in healthcare by accompanying the public sector in strengthening health services, professional training and mentorship, and targeted research. These goals are pursued in Neno by supplementing human resources with health professionals, infrastructure development, supply chain support, and a strong focus on a community footprint through a network of over 900 community health workers (CHWs).

Neno District is an extremely rural district in southern Malawi. The majority of the 150,000 people rely on subsistence agriculture, and only 4.3% have electricity. Neno became a district in 2003, a district hospital was built in 2008, and a community hospital was added in 2011. The MOH operates both hospitals in addition to overseeing a network of 11 health centers. PIH has worked with the MOH to delivery quality HIV care since 2007, enrolling over 7100 clients to date, with HIV care decentralized to all 13 facilities.

In 2009, the Neno Chronic Care Clinic (CCC) began enrolling patients at the district hospital, a 120-bed public facility situated in the center of the district. This clinic treats a range of NCDs, most commonly hypertension, asthma, epilepsy, diabetes, and congestive heart failure (CHF). Patients were referred to clinic from the inpatient setting, health centers, and community-based screening events. In 2013, the CCC also opened at Lisungwi Community Hospital.

3. Personal context

PIH comprises a team of nearly 300 people made up of executive leadership, clinicians and nurses, community outreach personnel, and support staff. Daily work is accomplished by working alongside the MOH in Neno to strive toward the goals outlined in the Health Sector Strategic Plan. MOH leadership consists of a District Health Officer (DHO), a District Medical Officer (DMO), and a District Nursing Officer (DNO)—along with four other members of the District Health Management Team—who lead the district in strategic planning, budgeting, implementation, and daily supervision.

After the initiation of CCC at both hospitals, clinical staff continued to notice an increasing burden of NCDs in Neno, including CHF and asthma admissions, and that HIV patients at antiretroviral (ART) clinic had a significant amount of hypertension, and so the team focused attention on the CCC program. However, though both clinics were running smoothly, as of August 2014 they remained vertical and pilot-sized. There were a total of 277 patients with hypertension, 38 with diabetes, 169 with asthma, and 189 with epilepsy. Moreover, based on Malawi epidemiologic data, if 33% of adults in Neno are expected to have hypertension, this clinic population only comprised 1.1% of the expected patients.

Given this unaddressed burden of disease, teams from PIH and MOH delved into the current state of the CCC program to devise possible solutions. This coincided with relatively new leadership in both organizations, along with a fresh commitment to partnership. These factors facilitated discussions and creativity around plausible ways to expand NCD care.

4. Problem

The team observed several key factors that defined the problem and ultimately formed the solution to pursue. These factors included a high default rate in the NCD population, the remote terrain and long distances patients were forced to navigate to come to clinic, and the severe human resource shortages. The team further noted the strength of the HIV program in Neno, an imbalance of funding and disease burden, and some past attempts at integration of HIV and NCD care that had not led to the intended outcomes.

4.1. High default rate

Enrollment at CCC at both the district and the community hospital had remained steady without significant increases over many months by the end of 2014. However, the clinic population was growing even more slowly as the default rate was significant. For example, at the district hospital clinic, 34% (N=241) patients had defaulted over the preceding two years. Though the HIV program had clear protocols for bringing patients back into care, the CCC program did not benefit from this system, and efforts to bring patients back were sporadic and often unsuccessful.
4.2. Distance to clinic

Distance to clinic was a key consideration as it is a known risk factor for non-adherence to anti-hypertensive treatment, particularly in settings of poverty and unreliable transportation. Practically, the median travel time to clinic for patients who were enrolled in CCC was 2 h, and about a third of the patients endorsed owning a bicycle. Vehicle ownership is virtually nonexistent, and there is no public transport.

Clinical staff recognized that many of these same patients were suffering from both HIV and NCDs (e.g., about 20% of the CCC patients were HIV-positive), but if they were enrolled in CCC they likely had to visit the hospital on separate days for their HIV and CCC appointments, thus increasing the burden of travel time.

4.3. Limited human resources

Overwhelmingly, the major problem with extension of NCD care to more facilities and patients was limited human resources. Most of the health centers in Neno serve populations from 2000 to 18,000 people, typically staffed by 1–2 nurses and a medical assistant. Addition of another vertical program requiring dedicated staff time and training would be an unrealistic undertaking, and the team knew that to achieve the EHP an innovative service delivery model would be required.

4.4. Excellent outcomes in HIV cohort

With an intimate understanding of human resource shortages as well as PIH’s strategic priority to bring innovative solutions to health delivery challenges, leadership saw opportunities for leveraging the robust HIV program to address common NCDs. The success in the HIV program was a major driver to expand lessons learned: a 2012 Survival Analysis of patients on ART in Malawi showed the national one-year survival rate to be 81% whereas the rate in the Neno cohort was 94%. Furthermore, 95% of ART patients had a visit in the preceding three months.

4.5. Imbalance of funding and staff to HIV

It was also noted that resources allocated to HIV and NCDs in Neno District did not mirror the burden of disease, a trend that is consistent across Malawi. In Neno in 2014, the budget for HIV care within PIH’s budget was almost 15 times that of NCD care, and the HIV program boasted 48 staff whereas only 4 full-time staff were uniquely dedicated to NCDs. This imbalance extended to the numbers of patients: in late 2014 an estimated 75% of the HIV patients in the district were enrolled in care whereas the same was true for only 1% of patients with hypertension and diabetes. These imbalances highlighted a clear need for expanded enrollment of NCD patients and leveraging of the HIV clinic.

4.6. Early failed attempts at partial integration

This need to leverage HIV services to care for the NCD population had been previously noted in Neno, with various efforts to increase case finding and referral for common NCDs dating to late 2013. For example, community-based HIV activities and clinics routinely screened for hypertension. The screening was accompanied by NCD education, attempts to schedule a single common visit for HIV patients with an NCD diagnosis, and educating the community health workers on common NCDs. Overall, the community outreach part was successful and well received: about 20 health talks reached over 2000 community members, and 776 CHWs were educated on NCDs.

However, initiatives to increase numbers enrolled in care were less successful. Between September 2013 and May 2014, 1056 patients were screened for hypertension at HIV events, of which 13.2% (N = 139) were referred. This was a substantial increase given that this would account for that time at almost half of hypertension patients in CCC. Furthermore, 13.7% of those referred had Stage III Hypertension (SBP ≥ 180 and/or DBP ≥ 110). However, linkage to care was poor: only 19.4% (N = 27) of referred patients were enrolled in CCC. Furthermore, less than 20% of dual-diagnosis patients were given a shared visit, and efforts at this system were aborted after several months. Ultimately, the shared visits were difficult to implement in a strongly vertical HIV program without supporting mechanisms for cross-talk between the two clinics in terms of supervision, documentation, and even geographic location within the hospital.

4.7. Goals for improvement

Given these challenges, the team identified major priority areas as increasing access to care for patients in this remote area through decentralization to all facilities, maximizing efficiency given the severe human resource shortages, and leveraging the positive outcomes from Neno’s HIV program. Ultimately, the aim was to improve a key indicator for the district’s health system: the number of facilities able to deliver the full EHP. Thus, MOH and PIH leadership embarked together to increase the stagnant number of 2 up to all 13 health facilities in Neno.

5. Solution

5.1. The Neno solution: integrating care

A key priority for the MOH-PIH team was a solution that could expedite decentralization of NCD care to all facilities. Even with PIH supplementation, limited human resources made establishing a vertical NCD clinic at all facilities impossible – most health centers were staffed with 2–3 health professionals and seeing over 100–200 outpatients per day. Additionally, given the complexity and longitudinal nature of NCD care, the team resisted integrating management into the outpatient departments.

Thus, in order to maximize efficiency, integration with HIV care became a clear path. The common needs between HIV and the NCD patients also contributed to this pursuit: routine appointments, adherence counseling, side effect management, laboratory follow up, and monitoring for disease progression. Given the previously failed attempts to leverage pieces of the HIV program, the team decided that complete integration was the most favorable option. By superimposing NCD care on the strong HIV platform, the team hoped that the success of the HIV program would propagate in a fully integrated model. Thus, in early 2015 the ART clinics were completely dissolved, and replaced by the Integrated Chronic Care Clinic (ICCC), affectionately known in Neno as ICIC, or ‘ice-cubed’. In essence, all patients with chronic illness – infectious or non-communicable – followed the pattern of the pre-existing HIV clinic. (Fig. 1)

Health care at public facilities is free in Malawi, and no user fees exist at 9 of the 13 facilities in the district. The remaining four charge user fees; however, given that this clinic is run and operated by MOH and PIH, with staff traveling to clinics on a regular basis to supplement clinic-based staff, care at ICIC is free of charge across the district at all facilities. The clinic is funded through the Malawi government, with PIH supplementing with additional staff members and clinicians, transport and fuel to the clinics, and supplementing specialty medications for the patients with NCDs, though the majority of medications are provided through the
public supply chain or through the Global Fund for the antiretrovirals.

5.2. The team

The linchpin in implementation of IC\(^3\) was to maximize efficiency – i.e. staff. No additional staff were hired, and the existing HIV staff became IC\(^3\) staff, joined by the small CCC team. The team was comprised of 13 integrated care clerks (formerly ART clerks), two nurses, two HIV testing counselors, four HIV-positive expert patients, and four clinicians. The clinicians are trained as clinical officers, a mid-level position requiring three years of schooling. This team was split across two hospitals as their home base and was responsible for IC\(^3\) in health centers in the hospitals’ respective catchment areas. Previously operating as an HIV-specific team, all team members recognized the need for more comprehensive care for HIV patients with comorbid non-communicable conditions, as well as integration with CCC to alleviate some of the practical shortages that clinic was seeing with limited accessibility outside of the two hospitals. This common recognition helped facilitate early conversations about clinic redesign.

5.3. Decentralization

Beginning in late 2014, patients seen at the hospitals for CCC were given follow up appointments at the health center nearest to their home according to the ART clinic schedule. Over several months all patients were given these appointments, and in early 2015 IC\(^3\) was underway. Following the existing HIV model, two teams travel from the base hospitals to the health centers three days a week to hold IC\(^3\) clinic. This process of decentralization was similar to the rapid decentralization of HIV care in 2007. (Fig. 2)

5.4. Patient flow

The model of patient flow and designation of ‘stations’ was instrumental in the clinic’s success. (Fig. 3) Uniformity in patient flow was essential for staff understanding, and integrated care clerks were the most influential as they staffed the majority of the stations. In fact, the main implementation process involved streamlining patient check-in and screening, and this was both the most time-consuming and difficult step undertaken. We learned through this experience the importance of leadership and ownership of various tasks: complete clarity was essential for staff and patient understanding and in ensuring all patients completed the entire process in the correct sequence. Ultimately, clerk ownership improved workflow, timing, and quality screening procedures. These solutions ultimately involved a reshuffling of tasks rather

![Fig. 2. Decentralization of the ART clinic, 2013.](image-url)
than the creation of new tasks, meaning workload for individual employees did not significantly change, and thus far the efficiencies created by combining the two clinics actually overshadow any problems with work overload.

5.5. Task shifting

Screening for common chronic conditions is part of the process performed by integrated care clerks. Prior to rolling out IC\(^3\), they underwent instruction sessions and mentorship to learn about taking blood pressures, screening for tuberculosis, and measuring body mass index (BMI) for evaluation of malnutrition. Training and implementation is currently underway for integrated clerks to perform diabetes screening for patients at risk, beginning with patients with hypertension, known heart disease, or a family member with diabetes. The clerks record screening data in the individual patient charts, and all positive screens prompt insertion of appropriate paperwork into the chart and notification of the clinician. The patient is then seen during the same visit for the new condition. Because results for TB come back the following day, the clerks are responsible for updating the TB screening register and notifying any patients with a TB diagnosis to return. They are then accompanied to enrollment in the national TB program, hosted in the Malawi MOH's environmental health division. Subsequently, patients return to clinic on the same day each month to attend IC\(^3\) and to collect their TB medications.

Though the clerks perform screening, clinicians were still expected to perform full evaluations, but this double layer improved clinical care. For example, at IC\(^3\) more patients are submitting sputum for TB evaluation if they are screened in a strictly protocolled manner. Given the multitude of factors being evaluated by a clinician, we found it beneficial to incorporate tuberculosis and other screening into the checklists for clerks.

Closely examining tasks for each cadre of health worker was also important. Tension arose as it became clear that nursing performed too many tasks as integration proceeded. This was solved through ensuring that patients followed all the steps sequentially, as well as assigning the clerks to pre-package NCD medications to facilitate speedy distribution of medications.

5.6. Data management

A key step in integration was to streamline data processes in order to obtain high-quality and useful data while eliminating redundancy. This involved a new storage system for all patient charts into one unique patient file, with each patients’ ‘screening record’ stored within it. Clerks then only have one place to obtain files, and patient confidentiality is maintained. This component is still in process, with simplification of the NCD files into one ‘mastercard’ underway, mimicking the HIV system. We are also awaiting permission from National HIV Unit to store ART mastercards in each patient’s file. A daily report is being piloted to capture simple numbers of patients seen, screened, and diagnosed with a new condition.

5.7. Supply chain

HIV medications in Malawi are supplied by the Global Fund to all health centers in Neno, and stockouts are extremely rare. The remainder of medications are supplied through the public system via Central Medical Stores (CMS) in Malawi. In Neno District, PIH acts as a backstop to CMS, providing essential medications during times of stockouts or varying consumption necessitating additional supplies. Additionally, PIH supplies a limited number of specialty medications to expand the existing formulary in Neno District. This is the system applied to the medications for chronic illness: the majority are provided through CMS with PIH supplementing as needed. A few medications such as ACE-Inhibitors are uniquely supplied by PIH. Because the NCD medications are requested primarily at the hospital pharmacies, clinic staff measures consumption and requests quantities on a weekly basis, repackaging them in pill bags for ease of distribution and bringing them to each IC\(^3\) clinic. It is anticipated that eventually the NCD medications will be hosted within individual health centers similar to other medications supplied through the government supply chain system.

5.8. Partnerships

A key to successful implementation was common recognition of the problem and agreement on a solution to try among all stakeholders: PIH, MOH, and the patients. The recommendation on provision of the EHP at all health centers by the Malawian government created a common goal, and working groups from both organizations talked through patient flow, challenges, and assignment of tasks. While key to implementation, consensus building took many meetings, and continues with bi-monthly meetings with IC\(^3\) staff to stoke quality improvement.

5.9. “Cross-cutting” patient needs

Through our discussions around clinic design, it was apparent that there are a few needs common to all these patients (Fig. 1). The first was nutritional status, and the clinic’s implementation was timely as it coincided with MOH efforts to test new protocols for adult malnutrition. IC\(^3\) offered a solution for a platform of care to ensure all adults diagnosed with malnutrition receive a comprehensive evaluation for underlying conditions such as HIV, TB, and malignancy.

Another common need is family planning, particularly in Malawi where the total fertility rate is around 5.7%. This step is still underway, but current plans are to initiate another ‘station’ for clerks to screen and refer patients to receive family planning counseling and administration on the same day. This allows for
another level of efficiency in the health system as staffing levels at most health centers dictate family planning only being offered on specific days of the week.

6. Unresolved questions and lessons for the field

6.1. Early successes

While staff are still learning valuable lessons and gaining implementation experience from IC^{2}, the current clinic allows all patients previously enrolled in CCC living in the remote, rural, and impoverished area of Neno to be seen on one day, at the nearest health center, for all of their chronic conditions. This supplements the former system of requiring them to travel to one of the hospitals for care.

As of the end of May 2015, IC^{2} is benefitting 6,781 patients on antiretroviral therapy (ART) and 721 patients with NCDs including 379 with hypertension, 187 with asthma, 144 with epilepsy, and 76 with diabetes. During the quarter from March to May 2015, IC^{2} had 6325 visits for ART, including visits for 238 new patients. The same time period saw 1064 visits for NCDs, including visits for 111 newly diagnosed patients. The overall HIV prevalence in patients with an NCD diagnosis is currently 15.1% (n = 109), slightly greater than the estimated district-wide prevalence, and about 5% less than at the end of 2014 as the NCD cohort expands. 56 Weekly community outreach events held in the most remote parts of the district began in early May 2015, each screening between 100 and 200 patients for HIV and hypertension and approximately 30–50 additional patients for diabetes. In May 2015, IC^{2} collected sputum for 47 TB suspects, with one identified as positive. The same month saw 1673 patients screened for malnutrition, with 18, 194, and 176 diagnosed as severely malnourished, moderately malnourished, and overweight, respectively. Implementation and strengthening is ongoing, with immediate next steps to include an ongoing focus on data quality as well as integration of family planning in the coming months. The current evaluation plan includes implementation of a monthly report which, among others, includes the following indicators: total patients enrolled by diagnosis, new patients enrolled by diagnosis, proportion of patients enrolled with 4 1 diagnosis, proportion of visits addressing 4 1 diagnosis, proportion of patients with a visit in the previous 3 months, and number of patients screened and diagnosed at IC^{2} clinic for hypertension, malnutrition, diabetes, and tuberculosis.

7. Lessons

One major lesson from this experience was the importance of clear leadership in clinic implementation as well as ownership of each individual staff member of their specific duties and value to the process. The process began with a few leaders, chosen because of positions within the organizational chart: the HIV Manager, HIV Officer, and the clinician responsible for CCC. These staff partnered with the HIV coordinator from the MOH. We found that without one individual spearheading the vision, making key decisions, and providing daily input of energy into the shift in job descriptions and processes, it was difficult to institute real change on a sustained basis. Eventually, one clinician emerged as a natural leader and was both freed from other responsibilities and given the authority to make key decisions. This, partnered with weekly check-ins delineating measurable progress, changed what started as a sluggish process to one that visibly moved forward each week. Another major lesson by leadership was to hold open discussions at biweekly meetings about troubleshooting unexpected problems, gathering staff feedback and concerns, and providing positive reinforcement with successes over the preceding two weeks.

Our second major lesson was the importance of identifying the crux of how to maximize efficiency, which in our case was this clarity in patient flow. Outlining this process was a turning point in our implementation process. In fact, it was the most time consuming subject of the biweekly meetings, and one that was continually addressed – and is still being addressed – in an iterative process of improvement.

A third major lesson was to continue quality improvement conversations during biweekly team meetings. This led to the discussions about nursing, and ultimately to a solution that allowed the clinical staff to practice at the top of their skillset as well as a more efficient system for medications.

At the beginning of implementation, there were several conversations about stigma – that by combining these clinics patient confidentiality would be compromised. However, by putting patient mastercards into a uniform file folder, we created a charting system where all patients appeared identical. This was combined with patient education about the new strategy at the clinic. A patient satisfaction survey is planned in the coming months, and will rely on baseline data collected pre-integration.

Ultimately, our main lesson was that given limited human and financial resources, innovative solutions are required in order to address a broadening horizon of chronic disease in Malawi. These solutions should help maximize efficiency and focus on a patient-centered approach, taking advantage of similar characteristics of chronic conditions when designing care delivery systems. IC^{2} is our version of tackling these challenges and striving to achieve delivery of the EHP at all facilities in Neno District.

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