

Community Engagement to Improve the Management of Non-Communicable Diseases

Experiences from Medical Service Trips in Southeastern Nigeria

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ABSTRACT

In rural communities in low-and middle-income countries like Nigeria, healthcare is a patchwork of services. Only a small portion of the healthcare provision in Nigeria



Picture 1. Volunteer nurses registering patients at check-in station.

comes from a unified health system. Therefore, remote and rural communities receive minimal preventive health services. Medical missions can play a critical role in closing gaps in care and improving healthcare access for vulnerable populations. However, long-term sustainability is difficult to achieve without deliberate community engagement from planning to evaluation. In this manuscript, the authors describe a collaborative, community-engaged global health service project in rural southeastern Nigeria that included medical missions and provided continuous care of non-communicable diseases post-mission for sustained impact. The

authors conclude with insights gained regarding the challenges of engaging communities at a distance through translational collaboration as well as implications for conducting such work.

Keywords: *Low- and middle-income countries, non-communicable diseases (NCDs), Medical mission, sub-Saharan Africa, Nigeria, Community engagement*

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BACKGROUND

Nigeria is a low-and middle-income country (LMIC) in West Africa, which has a healthcare workforce concentrated in urban tertiary health care centers, contributing to inequity of healthcare services in rural areas and poor management of non-communicable diseases (NCDs) (World Health Organization [WHO], 2020). In rural communities in LMICs like Nigeria, healthcare is a patchwork of healthcare services. Only a small portion of the healthcare provision in Nigeria comes from a unified health system. Therefore, remote and rural communities receive zero to minimal preventive health services (Innocent, Uche, & Uche, 2014). LMICs have limited health resources, which contribute to high morbidity and mortality from NCDs, such as diabetes and hypertension (Roth et al., 2018). Both diabetes and hypertension are expected to increase over the next few decades, especially in sub-Saharan African (SSA) countries like Nigeria (Adeloye, 2014; Adeloye & Basquill, 2014; Cho et al., 2018). If left untreated, diabetes and hypertension can cause cardiovascular disease, stroke, and eye diseases (Feigin et al., 2016). However, preventive care and primary care for NCDs are limited in LMICs, resulting in many undiagnosed cases. Other cases are diagnosed late, often through free public health outreach programs or “medical missions” (Sykes, 2014), resulting in suboptimal treatment and poor management (Burnier & Egan, 2019; Danaei et al., 2011). Misconceptions about the treatment of NCDs, such as believing that diabetes and hypertension are healed after completing a month of medication, also contribute to the high burden of these conditions (Amira & Okubadejo, 2007; Osamor & Owumi, 2011).

In many LMICs, gaps in health services are partially filled by medical missions or short-term medical service trips (MSTs) by non-governmental organizations. Medical missions are defined as travel by trained health professionals, to foreign countries, with a specific medical purpose for a designated period, ranging from one

Global health service projects should improve the health and well-being of the most marginalized populations from LMICs (Center for Disease Control, [CDC], 2015; Pratt, 2020), which can be accomplished by engaging the community through research and global health service projects.

week to years, depending on the organization (Malay, 2017). Similarly, short-term MSTs address the unmet health care needs of LMICs (Sykes, 2014). Increasingly, travel teams also include non-medical or allied health professionals. Although they prioritize medically underserved populations, medical missions often operate in silos, stay for short periods, lack long-term funding, and ultimately are difficult to sustain (Adepoju, 2019). Medical missions are not widely studied, nor are reports of medical missions widely disseminated (Sykes, 2014). The reports that are published in professional journals often only report the frequency of procedures or the number of patient visits. Rarely do reports demonstrate a thorough understanding of the social, cultural, and medical characteristics of the patient population served. Thus, little is known about optimizing and sustaining this service delivery channel in harmony with public health goals and the broader healthcare ecosystem. The lack of research on medical missions has led to lost opportunities to identify lessons learned and best practices (Sykes, 2014).

Global health service projects should improve the health and well-being of the most marginalized populations from LMICs (Center for Disease Control, [CDC], 2015; Pratt, 2020), which can be accomplished by engaging the community through research and global health service projects. Indeed, community-engaged experts have recommended guiding principles for forming effective community-engaged global health service projects in disadvantaged communities (CDC, 1997; 2015). Items included the host community

defining and directing the program, planning for sustainability programs, regularly evaluating programs for impact, and mutually learning from and respecting local professionals.

In Nigeria, the community includes local government leaders, policy-makers, tribal hierarchy, community organizations, community members, and their families. Anambra is a state in southeastern Nigeria and the eighth-most populated state in the Federal Republic of Nigeria. Over 60% of its people live in urban areas, making it one of Nigeria's most urbanized communities. Although Anambra State has the lowest poverty rate in Nigeria (Anambra State Government - Light of The Nation, n.d.), its rural communities need sustainable global health service projects. To effectively engage the community, attention must be given to existing dynamics of power, diversity, and stakeholders (Pratt, 2020). A voice must be given to those who feel powerless, such as individuals who are female, poor, under educated, and disabled (Pratt, 2020). This manuscript describes a collaborative, community-engaged, global health service project in rural southeastern Nigeria. Compared to traditional medical missions as defined above, the global health service project described here included not only medical missions but also continuous care of NCDs post-mission.

The Centers for Disease Control (CDC) recognized the critical importance of involving the community and collaborating with its members to improve health. In its seminal publication, *“Principles of Community Engagement,”* the CDC defined community engagement as the “the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people” (CDC, 1997, p. 9). Consistent with this definition, community engagement processes (described herein) were facilitated through the collaboration of two leaders (a medical director and a nurse), connected by their shared affiliation to the community and shared mission to improve the health of the community using their assets,

The two leaders sought input from respected residents and patients in the community and recruited local health care professionals to provide culturally relevant and acceptable services. Applying community engagement principles and processes was critical to the conceptualization and implementation of an effective and sustained project that improved the health of the community.

clinical experiences, and social connections. The two leaders sought input from respected residents and patients in the community and recruited local health care professionals to provide culturally relevant and acceptable services. Applying community engagement principles and processes was critical to the conceptualization and implementation of an effective and sustained project that improved the health of the community.

The purpose of this global health service project was to increase access to care for NCDs and improve patients' self-management of conditions, including diabetes and hypertension. Using 15 years (2004-2018) of field notes and programmatic data, we describe the processes and mechanisms utilized with respect to (1) working within the social and cultural context to treat NCDs and (2) engaging the community to improve healthcare; additionally, we (3) share lessons learned related to the importance of community engagement for long-term program sustainability.

ORIGIN AND EVOLUTION OF THE GLOBAL HEALTH SERVICE PROJECT

A Nigerian expatriate U.S.-based registered nurse (U.O.) was driven by a personal passion to give back. The journey began in December of 2003 when the nurse traveled to Amichi in Nigeria with her nuclear family to visit extended family and celebrate Christmas. While there, the nurse had planned to visit and tour the only hospital in the



Picture 2. Injection room before renovation

town to understand how medical and nursing care were structured and delivered to patients compared to the U.S. However, when she visited the hospital, the medical director, a physician, was not available, and therefore she did not tour the hospital. Rather, she left a duffle bag filled with band-aids, vitamins, and over-the-counter medical supplies. She had no other plans to return to the hospital before traveling back to the U.S. However, her 14-year-old son got sick with symptoms indicative of possible malaria, which she did not know how to treat. Therefore, she and her husband returned to the hospital with their son for treatment. Incidentally, the medical director was present and treated her 14-year-old son. The nurse reflected that she could not forget the exam room where her son was treated. The hospital environment was very clean, and the staff was warm and kind. However, they were working with very limited resources, as depicted in Picture 2 of the injection room. She made a promise to herself that she would renovate it (Picture 3). The nurse requested and received an appointment to tour the hospital on January 1, 2004.

The medical director (O. O.) was driven by a passion for improving the health of the local community. He had been in this position for one year, having been recruited by the hospital administrators to elevate the quality of service to residents of the community. He had been away



Picture 3. Injection room after renovation

from the hospital at a meeting the first time the nurse came and dropped off the duffle bag of medications. He appreciated that the nurse took the time to inquire about their well-being and bring medical supplies and hoped that she would return as promised. He urged the nurse to return for a tour of the hospital. The medical director and nurse decided to collaborate to develop a global health service project.

Host community defining and directing the program.

Before starting the global health service project, it was necessary to define the purposes of the engagement effort and the goals of the community. On New Year's Day, when people often celebrate with their loved ones, the medical director and nurse embarked on a four-hour tour of the hospital. During this needs assessment tour, the medical director and nurse discussed what the hospital and staff needed to care for patients. The medical director said they needed running water and medications. The nurse was astonished, thinking, "Really? What hospital operates without running water?" The medical director explained that the hospital had to bring water into the facility; if they did not, patients' families would have to bring their own water. The medical director described that they did not have access to authentic, quality medications. When available,

medications were unaffordable for both patients and the hospital. After learning about these difficulties, the medical director and nurse agreed to work together on a mission to improve access to health care services for the 50,000 residents of Amichi and the 23 surrounding towns in Anambra state.

Keys to Community Engagement: Trust and Shared Leadership.

The agreement to work together was supported by two principles fundamental to community engagement: trust and shared leadership. First, the medical director and nurse understood that building trust was important for soliciting buy-in and participation. While health services projects led by “outsiders” may struggle with building a trusting relationship within communities, this global health services project successfully built a trusting relationship because the leaders were community members. The medical director was trusted in the community, given that he had served and lived in the community for three years, and the nurse was trusted, given that she was a native of the town with strong ties to the community and cultural competence (i.e., asset-based engagement). Together, these two leaders recruited volunteers and colleagues to help transform the healthcare system. Second, shared leadership was important for improving access to affordable and quality health care services that can be achieved with genuine collaboration. The medical director and nurse shared leadership, co-directing the global health service project. They leveraged their respective assets and expertise to accomplish their shared mission on behalf of the community. Additionally, the medical director and nurse shared leadership, co-leading the global health service project. For example, to improve the quality of care, the medical director agreed to oversee all patient treatment and leverage existing nursing staff, whose buy-in was supported with small stipends in addition to their regular salaries, to provide patient care on a designated day of the week. To make care affordable, the nurse agreed to request medications from charity organizations

in the U.S., such as Americares. These donated medications would be dispensed at no cost to patients in Anambra, Nigeria. The two leaders committed to serving all persons irrespective of demographic, socioeconomic, religious, political, or other affiliations. The partnership was not codified in any written contract; rather, it was achieved through informal commitments and trust.

ANNUAL MEDICAL MISSION EVENTS

Partnering with the community was necessary to create change and improve health. In 2004, the medical director and other Nigerian-based volunteers collaborated with a U.S. volunteer team, including the nurse, her husband, and a U.S.-based physician, and conducted the first medical mission in the community. Since then, they have inspired the development of three other medical mission teams. The medical director and nurse worked collaboratively, led different components, and leveraged their respective social connections to improve the health of the community and its members. The Nigerian-based medical director coordinated volunteers, arranged community public service announcements, and arranged on-site amenities (e.g., chairs, tables, and refreshments) for volunteer workers. Volunteers were recruited via text messages and word-of-mouth. Volunteers came from other parts of Nigeria (e.g., Lagos) as well as the U.S. This local collaboration facilitated trust among community members who saw the local volunteers as trusted partners. The multidisciplinary volunteers of health professionals included nurses, doctors, and allied health professionals. To increase reach, medical missions were announced at key community gathering spaces, such as places of worship, schools, and markets. We recruited the services of the “town crier” who announced the mission to the residents.

The U.S.-based nurse oversaw fundraising. She solicited donations from family, friends, and colleagues in person and through letters. She explained that the goal of the global health service

project was to improve access to good, quality care and that monetary donations would be used only to purchase medications and medical supplies for patients. Additionally, she procured supplies for the medical missions from foundations and organizations in the U.S. (e.g., Timmy Global Health in Indianapolis, IN; Americares in Stamford, CT). Timmy Global Health provided administrative support by collecting donations and keeping records. Once the donations were received, the nurse requested relevant medications (e.g., high blood pressure and diabetes medications) and medical supplies (e.g., blood pressure monitors, glucometers, and test strips). She delivered them to Nigeria for medical missions and follow-up care. The size of the annual mission was tailored according to the amount of funding. We relied upon the medical director's first-hand knowledge of the community's most common health conditions to determine which medications and medical supplies to purchase. Understanding the most prevalent health conditions, the medical director and nurse used their limited resources to treat these conditions and sought partnerships with experts in these areas (e.g., opticians, optometrists, ophthalmologists). Given patients' needs, the volunteers usually included general practitioners (e.g., family medicine or internists) and eye doctors (usually opticians, optometrists, ophthalmologists). These volunteers were found through connections with the medical director in Nigeria. The medical director and nurse also collaborated with the university in the area and had their physician staff, residents, medical and nursing students volunteer during the medical missions. Non-health professional volunteers also were included to manage wait lines, housekeeping, hospitality, and coordinate meals for volunteers. The medical director and the nurse handled any logistical problems, such as delayed volunteer arrival, medication stock-outs, or emergent medical cases.

Logistically, to reach as many members of the community as possible, the annual medical mission event typically lasted one to three days for



Picture 4. Nurse measuring blood pressure for an adult patient.

eight hours (about 8 a.m. to 5 p.m.) each day. Therefore, preparing for this annual medical mission event required both the U.S. and Nigeria teams to coordinate their resources. Preparing for each annual medical mission event began six to 12 months prior. During each day of the medical mission event, patients were served on a first-come-first-serve basis. However, infants, older adults, disabled, or medically urgent cases were prioritized as they appeared. Each patient was assigned a participant number and received blood pressure, blood glucose, weight measurements, necessary treatment (e.g., wound care), medications from the pharmacy, and reading glasses as needed (see Pictures 1, 4, 5, and 6). The volunteer nursing staff supervised the pharmacy. These volunteer nursing staff also dispensed medication as ordered by doctors and educated patients on administering the medication, side effects, and signs of complications (see Picture 5). They encouraged patients with chronic conditions, such as high blood pressure and diabetes, to return to the follow-up clinic.

The host community's health care professional volunteers fueled and sustained this annual medical mission component of the global health service project. Compared to the U.S.-based

health professional volunteers, the host country's health professional volunteers had a greater understanding of the community's common health conditions, environmental and behavioral factors contributing to NCDs, and the health beliefs and practices affecting care utilization. Therefore, they had more culturally relevant communication strategies to increase the likelihood that patients would accept and adhere to treatment recommendations.

In contrast, volunteer doctors from the U.S. often struggled with their initial patient encounters. Compared to their local counterparts, they spent too much time with patients, wanted laboratory tests and results to confirm diagnoses, and used more resources to achieve the same patient goals. Although challenged, U.S.-based physicians often adapted after several patient encounters. For example, by their sixth patient encounter, they learned how to treat patients in this low-resourced community with limited laboratory diagnostics and tests.

Community engagement was sustained by identifying and mobilizing community assets and strengths and developing the community's capacity and resources to make decisions and act. The power of the medical director's connection with the community cannot be overstated. In the absence of these connections, there would not have been the same number and caliber of health professional volunteers from the community.

These connections were critical to effective and sustained community engagement. The medical director and nurse provided honoraria to volunteers as a small token of their invaluable contributions to the community. Honoraria took different forms, including small amounts of money, certificates, pens, and bags. One year, stethoscopes, donated by a sponsor, were distributed to volunteer nursing staff and nursing students. Although the volunteers from the U.S. paid for their flight tickets to and from Nigeria, the nurse personally provided them free accommodations and meals.



Picture 5. Nurse providing medication education to mother and child.

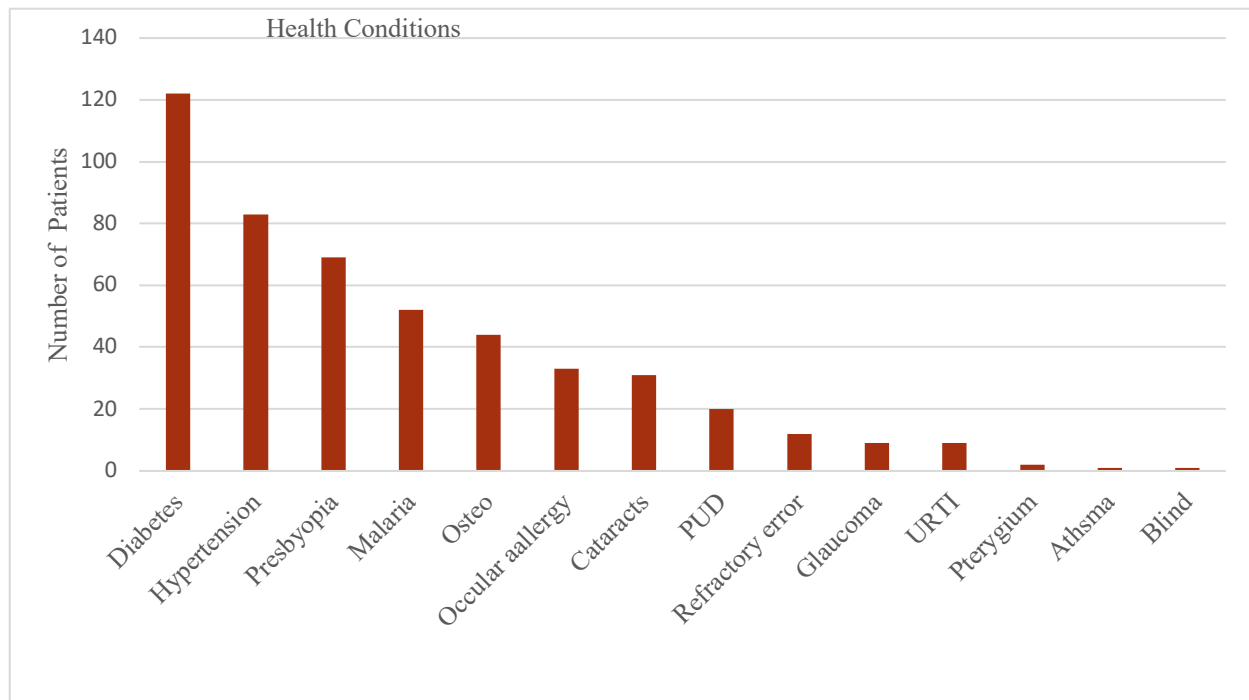
PATIENT POPULATION SERVED

To determine community health needs and resource allocation, the medical director and nurse gathered demographic and clinical information from patients. Each patient was given a registration card at check-in, upon which staff volunteers recorded the patient's age, gender, weight, blood pressure, blood sugar reading, medical diagnosis, prescribed medication(s), and any follow-up recommendations. Data showed many patients presented with malaria, osteoarthritis (especially women), ulcers, and upper respiratory infections. The most prevalent health conditions were diabetes (52%), hypertension (45%), and eye problems (74%) (see Figure 1). Regarding eye problems, patients sought treatment for presbyopia, glaucoma, ocular allergy, refractory error, pterygium, and blindness. Although the eye conditions the team treated were related in part to chronic health conditions such as diabetes, the lack of access to specialized care and prohibitive costs of such care also played a role (International Agency for the Prevention of Blindness 2014; World Health Organization, 2013).

There were factors that affected community engagement efforts, and consequently, the number of patients served during the annual medical mission events. First, extensive coverage of our outreach efforts in the local community was

Figure 1

Number of Patients and Health Conditions Addressed during the Medical Missions in 2018



necessary to create awareness and drive patients towards our services. Over time, experience showed that there was more demand for services than were offered during the yearly intensive days of the mission. In fact, the more days we offered, the more patients we served. In the early years, the annual medical mission event lasted three days and served about 225 patients per day. Over time, as we honed in on community needs, the medical mission event lasted a day and served 250 patients. The medical director and nurse became more confident in their knowledge of the community's needs, which allowed them to become more effective at identifying and mobilizing local health professional volunteers. The volunteers became more invested in the medical mission events, recruited colleagues, and returned each year as they became familiar with expectations, policies, and procedures and valued the community. In essence, the event ran much more smoothly, and because less time was spent removing roadblocks (e.g., lack of familiarity with procedures), more time was spent on patients.

The average number of patients seen per day varied by the number of volunteer doctors and nurses available per day. The medical director and nurse aimed to have five doctors and ten nurses each day. Second, it was necessary to tap into local leaders who had clout or were respected in the local community. The number of patients served during a mission day increased when the message was delivered more frequently and to more community venues. The effectiveness of the public announcement to the community also varied according to whether the town announcer or the medical director publicized the event. Many throughout the community knew the town announcer. He drove around, announcing the date and location of the mission over a loud microphone. On the other hand, the medical director distributed letters and flyers to key community settings (e.g., churches, market places). Compared to the medical director and his methods, the town announcer was more effective in reaching community residents. Using culturally appropriate strategies, such as asking the town

announcer or “town crier” to pass along information to the community, was important to facilitate community engagement. Third, eye care was a major issue that only surfaced through formal and informal data collection. For example, patients would ask every year if we had an eye doctor on site. More patients were served when opticians and/or ophthalmologists volunteers were available and provided eye care services. In fact, the number of patients served doubled if eye care was provided in addition to care for other health conditions.

Since its inception in 2004, the medical director, nurse, and their team of volunteers have provided 39 service days, during which they served 7,376 unique children and adults (2,459 males and 4,917 females) from 23 surrounding communities. The team also has conducted 50 cataract surgeries for adults, distributed 3,000 reading glasses, and provided routine follow-up care as needed. Below are descriptions of three patients who illustrate the impact of the team’s work and inspirations to continue the medical missions. Pseudonyms rather than patients’ real names are used.

Mrs. Eunice. Mrs. Eunice was in her 30s and presented with her four children, ages 2 to 8 years old. She reported that she was stressed and worried about the children because they all had fevers over the past three days, which she attributed to malaria. She said that she was at a loss until an acquaintance told her about our free medical mission, which the acquaintance had heard about from a public announcement at a community event. Mrs. Eunice shared that she was especially stressed because she also was caring for her husband, who had a stroke a few weeks prior. She was unable to bring him to the clinic because she could not obtain transportation for him. Given the children’s young ages, we prioritized their services. Each had their blood pressure, blood glucose, and weight measured, and then were evaluated by a doctor and tested for malarial parasites. Each child received free anti-malarial medications from the pharmacy, where a



Picture 6. Volunteer student from U.S. and nurse from host community sorting reading glasses.

nurse instructed Mrs. Eunice about how to administer the medications. We encouraged her to return with her husband to the follow-up clinic.

Mr. Adazi. Mr. Adazi was in his 60s. He regularly attended the annual medical mission and occasionally sought follow-up care. He was diagnosed with diabetes, for which he took oral hypoglycemic medication for blood glucose control. He regularly received the medications at no cost from our free clinic. He stated that his symptoms had improved. For instance, he shared that he was waking up less frequently to urinate at night. He reported that these improvements motivated him to take his medication regularly. Our team also provided education on healthy food choices and blood glucose monitoring so he could better manage his diabetes.

Mrs. Uzo. Mrs. Uzo was in her early 70s. She has sought care from the medical mission and follow-up clinic since the inception of the program. Mrs. Uzo had bilateral knee arthritis, for which our team provided regular steroid injections. Over time, we observed gradual worsening of her knees, which led to her needing crutches. Our team provided her with medications through our follow-up clinic. Although we wanted to perform a knee replacement surgery, it was cost-prohibitive and something the mission could not provide for free.

SUSTAINABILITY AND CONTINUITY OF THE GLOBAL HEALTH SERVICES PROJECT

Global health service projects must plan for the continuous care of NCDs after the annual medical mission events. The ability of this global health service project to provide follow-up care is what sets it apart from traditional medical missions. Since starting this health service project, the medical director and nurse have inspired three other medical mission teams. However, only the medical director and nurse have instituted continuous care of NCDs post-mission. They believed that the provision of follow-up care was not only a professional responsibility but also an ethical imperative.

Therefore, they offered a weekly clinic for follow-up visits after the annual medical mission event ended. The weekly follow-up clinic was designed to facilitate continuous care and help patients gain the knowledge and skills necessary for self-management. A member of the community donated a building from which the follow-up clinic operates every Wednesday. This donation was a testament to community buy-in and engagement. The donor renovated the building to include exam rooms, pharmacy, and waiting areas. The medical director, led and conducted the clinic with a small crew of three nurse assistants who received a small stipend for their time. Every Wednesday for half a day, patients were seen for different ailments. Visits began with checking vital signs and were followed by medical consults. If needed, medications were dispensed at the pharmacy.

Since 2007, the weekly follow-up clinic has expanded its services to two days a week, including one day on the weekend to meet the needs of both walk-in and scheduled patients throughout the year.

Regular evaluation of impact, mutual learning, and respect for local professionals was critical to effective community engagement. Like the annual medical mission events, collecting formal and

informal data from community members was necessary to address key health issues (e.g., high blood pressure, diabetes, eye diseases) affecting community members' well-being. For example, within the early years of the project, the medical director and nurse confirmed that the most prevalent health conditions in the community were diabetes, hypertension, and eye diseases.

Subsequently, they used this data gathered onsite to benefit the community. The human and medical resources were targeted to screen, treat, and educate patients about diabetes, hypertension, and eye diseases. The health conditions for which there was the greatest demand (e.g., eye care) received the most resource allocation. Therefore, the nurse and medical director sought partnerships with experts in these areas (e.g., opticians, optometrists, ophthalmologists).

Additionally, consistent availability of medications in the pharmacy and provision of walk-in clinics were concerns that only surfaced through community stakeholder discussions. The medical director and nurse deliberately sought feedback from patient stakeholders to understand patterns in attendance (e.g., did more patients keep an appointment if it was scheduled or walk-in) and adherence to medication regime (e.g., did patients purchase medication prescribed or not when they had to buy from outside pharmacies). All data were de-identified, digitalized, and in a database, and used for annual reports to individual and organizational medical and financial sponsors. Since 2014, a donor and volunteer base maintained records on a website at www.providencechi.com.

LESSONS LEARNED FROM THE FIELD

Lesson 1. Thoughtful and deliberate approach to community engagement required to enhance long-term sustainability.

Consistent with community-engaged inquiry, the medical director and nurse were involved in all

aspects of the global health service project, which included two components – an annual medical mission and follow-up clinics. Their collaboration was vital to the success and sustained operations of both the medical missions and follow-up clinics.

While the medical director committed to garnering resources in Nigeria, the nurse committed to leveraging her connections in the U.S. to meet the healthcare needs of the community. The medical director contributed assets related to his knowledge of the lay of the land and all of its cultural nuances and, therefore, was instrumental to the development and implementation of the global health service project in the community. He advertised the medical mission and invited volunteers from the community, health professional organizations, and the local university. Although the medical director and nurse did not explicitly discuss power dynamics, they made a verbal commitment to work together towards a shared mission. They nurtured this collaboration with mutual respect, inclusion, equal leadership, and acknowledgment of partners in reports and publications.

Consequently, they extended services to all members of the community without discrimination. The multidisciplinary team of health professional volunteers was essential to providing high-quality care to thousands of patients while keeping labor costs to a minimum. Several volunteers have served an average of five years, and this is a testament to the mission's success in engendering community service. Partnerships with committed and reliable individuals and organizations facilitated credibility, community buy-in, execution of annual medical missions, and program sustainability.

Lesson 2: Mutual learning and respect for local professionals.

Both the medical director and nurse needed each other to actualize and achieve the global health service project. Although the donated money,

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medications, and medical supplies from the U.S. were helpful, neither the medical director nor nurse would have been able to provide or sustain services over the course of 15 years without the host country collaborators (e.g., medical director, volunteer team, and partner university). While the medical director accessed the medications and medical supplies needed to improve the community's health, the nurse realized her passion to give back to this community – all from a distant continent away – thanks to the trusted partnership and shared affiliation with the community. However, engaging with communities from a distance is not for the faint of heart, as trust is essential. For example, individuals must trust that people will do what they say they will do, relying on each person's intrinsic motivation and commitment to public health. Additionally, transparency is important, especially given that partners may not always agree. For example, the nurse once suggested increasing care access and utilization by providing blood pressure screens at the marketplace. However, regulations prevented public health screenings to ensure equal access to patient populations by local health care providers. If the medical director had not redirected the nurse, and the nurse had proceeded with this care delivery idea, they would have been perceived as taking patients and revenue away from the local professionals. The nurse acknowledged the medical director's advice and did not pursue this idea to maintain relationships with providers in the community. In sum, the partners needed to be open to adapting care practices and delivery structures to meet the needs of all community stakeholders. Furthermore, regular communication fostered trust and accountability among partners and community stakeholders. The

nurse and medical director maintained regular communication via WhatsApp, sometimes multiple times a day. Communication required a reliable medium or platform, particularly in a low-resourced community where broadband was not readily available. They learned flexibility and patience, which helped them persist and achieve their shared mission of improving the health of the community.

Lesson 3. Capacity building within the host community to enhance sustainability.

Both the medical director and the nurse believed they had a responsibility to develop the host country's workforce capacity so that the program could continue when the U.S. team left. They also recognized the importance of developing a pipeline for the next generation of leaders. For example, one year, a U.S.-based physician trained the host country medical director on how to administer steroid injections to women who had osteoarthritis of the knees. Both the U.S.-based nurse and Nigeria-based medical director have mentored young clinicians. They engaged nursing students, medical students, and residents from the local university in the medical missions. Since 2013, the global health service project has maintained a small crew of four paid staff, including the medical director and four nursing staff, to run the follow-up clinic. The art of community service has been infectious. Although Nigeria is considered a developing country with limited resources and a weak healthcare infrastructure, community-based care (i.e., global health service projects) delivered by expatriate and local health care professional volunteers filled critical gaps in healthcare. In the U.S., underserved populations in urban areas could benefit from similar community-based outreach projects.

Lesson 4. Planning for the continuous care of non-communicable diseases post-mission.

Follow-up care is critical to not only track patient

The success of the mission was grounded in community-engaged partnerships between the host and U.S. teams with committed individuals and organizations who facilitated credibility, community buy-in, coordination of resources, execution of annual medical missions, provision of follow-up care, and program sustainability.

progress but also promote education (e.g., signs and symptoms of hypertension), treatment, and self-management. Misconceptions about the treatment of non-communicable diseases were common, and intervention beyond the initial visit was critical. Many patients believed that chronic conditions, such as diabetes and hypertension, heal after completing a month of medication. Given that there would still be ongoing healthcare needs, the team taught patients that diabetes and high blood pressure do not just go away and helped them develop self-management skills through diet and increased physical activity. Unlike other medical mission teams in Amichi, our team was the only one that provided follow-up clinical visits. This allowed for effective and sustained behavior changes that improved the health of the community. Ideally, medical mission teams would form a coalition and pull their resources to scale staff and service capacity, thereby increasing follow up clinics from a few days to every day of the week. That kind of coalition would optimize and sustain this service delivery channel in harmony with public health goals and the larger healthcare ecosystem.

Lesson 5. Data collection is key to regular evaluation of programs for impact.

There is a need for medical mission programs to collect data, use it, and share findings. Data collection serves several functions. First, data were needed to identify areas for improvement. Second, data were needed to assess and document the impact of medical missions on patient population outcomes. Documenting the impact on populations could better position teams to seek

sustained funding from organizations such as the Bill and Melinda Gates Foundation, Rotary International, and other global organizations. Lastly, careful tracking of the impact of medical missions on healthcare costs is needed. Quantifying the economic benefits of addressing these health conditions may motivate government agencies to lend their support to non-profit organizations working to improve access to and affordability of care for underserved populations. Having alignment between the global health service project and local government's priorities may improve internal and external funding and long-term sustainability.

POLICY AND PRACTICE IMPLICATIONS

The team's field experiences can be of benefit to health policy and practice in local communities. First, community-engaged medical missions and follow-up care engender public service, build goodwill, and break down walls. Nurses, physicians, and other health professionals seeking to establish medical missions will need to develop collaborative partnerships with the community, provide follow-up care services, and build workforce capacity in host communities to ensure sustainability. While these collaborations can address the health care needs of the host community, visiting volunteers also can learn from the host community to inform work in rural and underserved communities in the United States. This team collaboration has the potential to drive policies that lead to systemic changes in funding, structure, and delivery of health care. Second, the critical importance of data cannot be overstated. Medical mission teams need to systematically collect sociodemographic and clinical data to help determine the prevalence of health conditions in communities and inform data-driven decision-making. These local data from various teams conducting medical missions can be de-identified, aggregated, and submitted to local public health agencies, then analyzed to inform need and large-scale implementation across communities. Third, given care gaps in eye

care, there is a need for the provision of eye care services both during the medical mission and during follow-up clinics. For example, an optometrist and optician could visit once a month to serve patients during the follow-up clinics. Patients who need eye care would be scheduled ahead of time. Similar models could be adopted and scaled up across communities by local health governments.

CONCLUSION

We have described our experiences with conducting an ongoing global health services project in rural Southeastern Nigeria. Our local and global collaboration, which consists of U.S.- and Nigerian-based health care professionals, has spanned 15 years. Community engagement and stakeholder involvement have contributed to the sustainability of the medical mission project. The success of the mission was grounded in community-engaged partnerships between the host and U.S. teams with committed individuals and organizations who facilitated credibility, community buy-in, coordination of resources, execution of annual medical missions, provision of follow-up care, and program sustainability. The medical director and nurse successfully shared knowledge and skills among volunteers from the host country and the U.S. The multidisciplinary volunteers included not only professional nurses but also the next generation of health professionals, including nursing and medical students. The medical director and nurse modeled mutual respect and trust, patient-centered care, and commitment to community service. Therefore, volunteers returned every year to work and support the health of the community. Additional work is required to monitor health outcomes, evaluate the impact of our medical mission, and create a cost-effective and sustainable model to improve the health of this population. Thoughtful consideration of the types of data to collect and implement uniformly is critical to tracking trends in population health over time.

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