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Strengthening Primary Care in Rural Kenya through a Health Management Information System (HMIS)

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Innovations in Healthcare is a nonprofit organization hosted by Duke University and founded in 2011 by Duke Health, McKinsey & Company, and the World Economic Forum. We aim to improve healthcare worldwide by supporting the scale and impact of promising innovations.

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ACKNOWLEDGEMENTS

Introduction

Access to healthcare in rural and remote areas of low- and middle-income countries is often limited, with lack of infrastructure, distance from facilities, and limited health literacy posing barriers to health-seeking behavior in these populations. Afya Research Africa (ARA) aims to increase access to high-quality healthcare in underserved, rural, and remote areas in Kenya by establishing health kiosks and medical centers that are co-owned by community and local stakeholder partners. Founded in 2009, ARA operates 25 health kiosks in 4 counties in Kenya, reaching about 65,000 patients annually.
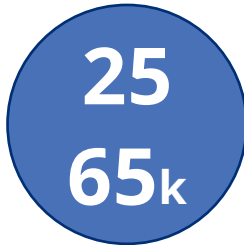
25 KIOSKS

65k PATIENTS ANUALLY

Comprehensive Health Management Information System to Improve Primary Healthcare

Through their work in rural Kenya, the ARA team learned that patients often seek healthcare for more than one health concern or issue, but that the full scope of a patient's health was not routinely recorded during visits due to the lack of a centralized system for health data. Patients' health conditions or concerns beyond their specific reason for a visit were not always captured by the disparate, siloed systems that were in place. The lack of robust data systems also meant that it was difficult to ensure continuity of care, as there was not enough data in one centralized, easily accessible location. Providers were therefore unable to track patients over time, see if they were attending follow-up appointments or obtaining the appropriate medicines/ treatments, and contact the patients to follow up as needed.

In response to this problem, ARA developed and deployed Stone HMIS (health management information system), which is designed to capture health records and other patient data. It also has the capacity to improve management of health kiosks and health centers with capabilities to collect and analyze administrative, operations, and financial data. Additionally, Stone HMIS links to community health worker (CHW) data collection tools, so that information collected about patients by CHWs is also included in one central place along with records from facility visits. Having both household-level data and facility-level data in one place helps clinicians more fully understand a patient's history and thus provide appropriate care. CHWs are also given the capability to make referrals directly in the system, making it easier for ARA staff and providers to follow a patient's journey: seeing if they are able to access care and following up if needed to improve continuity of care for patients who may otherwise fall off the care continuum.

Development and Operationalization of HMIS

Leveraging the expertise of the project lead as both a programmer and a medical doctor, ARA responded to the data needs on the ground and built the Stone HMIS system in-house. Selecting this doctor to lead the programming team, bringing in a clinician's perspective of information and process flows, was important for the system's design to be fit for purpose from the outset. ARA also worked to prepare infrastructure at each point of care so that the system could be deployed and implemented smoothly: each point of care required at least three computers (for registration, consultation rooms, and the pharmacy) as well as reliable networking and internet connectivity. Due to limited connectivity, particularly in remote areas, systems at facilities may not be consistently connected to ARA's main server. To account for this challenge, ARA designed a system by which reports are sent periodically from each site to the central team to aggregate the data. ARA also added solar power to remote facilities with inconsistent power to facilitate consistent access to Stone HMIS; solar power has since become a standard feature across all ARA's points of care.

Impact of the Improved HMIS

Since implementing Stone HMIS, the ARA team has seen improvements in its internal management processes, reporting capacity, and ability to tailor ARA's healthcare services to its target populations.

Efficiency in financial and resource management

- Stone HMIS enables the ARA team to track resources and commodities at facilities to help teams better understand the stock at each facility and prevent stockouts through planning and resource management. For example, during a government strike, patient volume may increase greatly as people seek care from ARA facilities instead of government facilities that have closed due to the strike. Stone HMIS helps ARA staff to quickly identify if a kiosk is experiencing an influx of patients and ensure that those kiosks are supplied with PPE, commodities, medicines, and other resources as needed.
- Stone HMIS enables ARA to track finances at facilities, supports the development of budgets, and provides greater accountability for regular finances and commodities metric tracking. ARA's HMIS integrates with third-party payment systems that allow ARA to receive and track payments in cash, mobile funds, or credit card as well as receive insurance co-payments, bundled payments, and capitation.

Improved reporting capacity, quality, and integration with government systems

- Stone HMIS sends the required monthly health service delivery summaries directly to the national government system portal (DHIS2), thereby streamlining ARA's reporting processes and contributing to ARA's efficiency as well as government efficiency at county and subcounty levels.
- For local health systems with separate reporting requirements from the national government, Stone HMIS helps the ARA team aggregate data quickly and more efficiently than doing it by hand when creating monthly local reports.
- Stone HMIS improves ARA's reporting quality as it enables them to report accurate data on patients served to the government, which then helps ensure that they receive the right allocations of resources and commodities from the public sector.

Improved monitoring and response to health trends

- Stone HMIS enables ARA to see disease trends: since Stone HMIS functions as a centralized database for patient and population health data, the team is able to identify disease patterns quickly and adjust their services accordingly. In the case of a malaria outbreak, for instance, ARA could provide training on updated protocols and share information about newly available treatments, such as vaccine trials in which patients might be eligible to participate.
- Identification of disease outbreaks and other health trends enables ARA to proactively communicate with government partners and work together to collect more data, monitor the impacts on the communities they serve, and adapt services and programs as needed.

Impact on health outcomes

Over a two-year period following implementation of Stone HMIS in communities in Northern Kenya, ARA found measurable improvements in maternal health indicators: a 5% increase in women attending a fourth antenatal care visit, a 23% increase in skilled deliveries, and a 16% increase in newborn post-natal checks within 48 hours of delivery.

Key Lessons

- ARA's work with Stone HMIS has further emphasized to the team the importance of following up consistently with patients. **The ARA team has observed that timely and appropriate follow-ups help ensure patients return and receive healthcare to address the full scope of their health needs**. In communities with improved patient outreach and follow-up facilitated by Stone HMIS, ARA has seen increases in key healthcare utilization indicators. ARA continues to maintain this focus on continuity of care as it improves Stone HMIS with features such as connection to CHW data collection tools.

ARA also learned from the development processes for Stone HMIS that it is essential to first start by understanding the challenge, then use that understanding along with real-world, context-specific evidence to design the solution. This includes considering what solutions are locally appropriate, what is feasible with internal resources vs. what may require outsourcing, and what would be most sustainable in that context. ARA began developing Stone HMIS in response to gaps in patient health data and a lack of comprehensive health records that limited providers' ability to understand patients' medical histories and provide high-quality care. **During the process of development, the team learned that, beyond creating the system itself, it was also essential to tailor implementation to the context by strengthening infrastructure and linking with current practices on the ground**.

Recommendations for Health Innovators

1

A clear understanding of the context of the problem, the patient population, and the target end users is essential to be able to create fit-for-purpose solutions.

This foundational understanding should drive the design of programs so that they are adapted to meet local needs effectively and suited to the workflows of target user groups.

2

Strive to have as much health data aggregated and accessible as possible, including sharing data with other organizations as needed, to understand a patient's whole journey and provide better care as a result.

This could include bringing together facility data, MOH data, CHW data, and county or sub-county level data from other organizations to generate the best possible understanding of local health needs as they emerge.

Recommendations for Global Health Funders

1

When designing programs and making funding decisions, take into consideration innovations that cut across multiple disease conditions and stages.

When designing programs and making funding decisions, take into consideration innovations that cut across multiple disease conditions and stages — including those that address the determinants of health, integrate healthcare services and processes efficiently, and aim to treat the whole patient rather than focusing on disease condition — to pave the way towards more comprehensive, efficient, and high-quality health systems.

References

1. Alain B. Labrique et al., "Best Practices in Scaling Digital Health in Low and Middle Income Countries," Globalization and Health 14, no. 1 (November 3, 2018): 103, https://doi.org/10.1186/s12992-018-0424-z.

2. Elizabeth A. Mitgang, Joaquin A. Blaya, and Mickey Chopra, "Digital Health in Response to COVID-19 in Low- and Middle-Income Countries: Opportunities and Challenges," Global Policy 12, no. S6 (2021): 107–9, https://doi.org/10.1111/1758-5899.12880.

3. Nachiket Gudi et al., "Challenges and Prospects in India's Digital Health Journey," Indian Journal of Public Health 65, no. 2 (April 1, 2021): 209, https://doi.org/10.4103/ijph.IJPH_1446_20.

4. Nigel Cory and Philip Stevens, "Building a Global Framework for Digital Health Services in the Era of COVID-19" (Information Technology and Innovation Foundation, May 26, 2020), https://itif.org/publications/2020/05/26/building-global-framework-digital-health-services-era-covid-19.

5. Cecilia Garell, Petra Svedberg, and Jens M Nygren, "A Legal Framework to Support Development and Assessment of Digital Health Services," JMIR Medical Informatics 4, no. 2 (May 25, 2016): e17, https://doi.org/10.2196/medinform.5401; Cory and Stevens, "Building a Global Framework for Digital Health Services in the Era of COVID-19."

6. World Health Organization, Global Strategy on Digital Health 2020-2025 (Geneva: World Health Organization, 2021), https://apps.who.int/iris/handle/10665/344249.

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