DIAGNOSTIC HEALTH TRACKER TO PROMOTE QUALITY OF CARE AS KENYA MOVES TOWARDS ACHIEVING UNIVERSAL HEALTH COVERAGE

Summary

Diagnostics, which accounts for up to 70% of all medical decisions, has always played a significant role in determining clinical decisions. As Kenya progresses toward universal health coverage (UHC), diagnostics must be included as a key component within the health system infrastructure. A study aimed to develop a Diagnostic for Universal Health Coverage Tracker (Dx for UHC Tracker), and promote the integration of diagnostic data in decision-making to improve access and quality of primary care services.

The Dx for UHC Tracker was piloted in the Kenyan counties of Nyeri, Kisumu, Kilifi, and Nakuru. Data were collected over an 18-month period from 223 health facilities (levels 2 to 6 HFs) in the four study counties. Capacities for triage investigations, testing for communicable diseases and non-communicable diseases, as well as investigations on maternal health were weighted and aggregated to formulate the capacity index using various diagnostic tracer items. All the data were analysed and shared on the Dx for UHC Tracker dashboard.

The Dx for UHC Tracker platform provides an opportunity to share results and recommendations, gather learnings and best practices, create a community of practice, and transfer a model approach with the potential to scale up to other counties.

Key messages

- Overall, 37% of the health facilities (HFs) in the four study counties are government-owned, with Kilifi and Kisumu counties being more dependent on government-owned HFs than Nyeri and Nakuru counties.

- Through the Diagnostic for Universal Health Coverage Tracker study by Jomo Kenyatta University of Agriculture and Technology (JKUAT) and Foundation for Innovative New Diagnostics (FIND), a survey was conducted under four major indicators representing capacity for investigations on triage, communicable diseases (CDs), non-communicable diseases (NCDs), and maternal health. Select tracer indicators were then used to measure the capacity to deliver diagnostic services.

- In the four counties, the overall average capacity index was 52.9%, from 66 level 2, 111 level 3, 42 level 4, 3 level 5, and 1 level 6 HFs. Nyeri had the least number of level 4 HFs and the highest number of level 2 HFs.

- In Kenya, approximately 39% of deaths were due to NCDs, up from 27% in 2014. Despite the increased deaths, the weakest link was the capacity for NCDs.

- It is expected that all HFs have triage as a first step in providing care. However, the aggregate capacity for this was 75.5%, with the largest gap experienced at the level 2 HFs.

- Diagnostic confirmatory tests for breast and cervical cancers among women were only available at level 5 HFs, while most of the other facilities only having the capacity to screen.

- The managers of HFs and laboratories within counties and actors within local ministries of health can interact with the Dx for UHC Tracker platform, creating county hubs to spur data exchange and operational planning.

Background

Accessible and affordable diagnostic services are critical components of quality health care as we progress toward achieving universal health coverage (UHC). High-quality health care begins with seeking care, followed by a diagnosis that leads to appropriate therapy. However, in low- and middle-income countries (LMIC), diagnostic access gaps remain high, leading to health workers relying on syndromic approaches and resulting in empirical treatments that drive the misuse of therapeutics as well as antimicrobial resistance.

In Kenya, based on the Kenya Health Sector Strategic Plan 2018–2023 (KHSSP)[1], the country's health care system is structured in a hierarchical manner that begins at primary health care (PHC), whose lowest unit being the community, and then graduates, with complicated cases being referred to higher levels of health care. Based on the Kenya Harmonized Health Facility Assessment (KHFA) carried out in 2018, the mean availability of diagnostic tests was 56%. However, only 17% of health facilities (HFs) have all the diagnostic items. HFs are most likely to have HIV diagnostic capacity (84%) and malaria diagnostic capacity (74%), while HFs are least likely to have diagnostics for haemoglobin (30%)[2].

To understand the diagnostic capability of HFs in Kenya, researchers at Jomo Kenyatta University of Agriculture and Technology (JKUAT) with support from the Foundation for Innovative New Diagnostics (FIND) conducted a pilot study in four of Kenya's 47 counties, selected to represent Kenya's different disease zones. This study aimed to develop a Diagnostic for Universal Health Coverage (UHC) Tracker, which will promote integration of diagnostic data in decision-making to improve access and quality of primary care services. The Dx for UHC Tracker platform tracks the availability and utilization of diagnostics for UHC in these four Kenyan counties.

[1]Ministry of Health Kenya. (2018). *Kenya health sector strategic plan 2018 - 2023*
[2]Ministry of Health Kenya. (2019). *Kenya harmonized health facility assessment (KHFA) 2018/2019*.

Approaches

This observational, mixed-method, cross-sectional study assessed county diagnostic investments/services and their changes through tracer indicators that were used to measure availability, affordability, and quality for high-burden diseases. Four out of a total 47 counties were selected based on (i) high-burden communicable disease with underlying high malnutrition; (ii) high-burden non-communicable disease; (iii) high maternal mortality; and (iv) high burden of road traffic injuries. Nyeri and Kisumu counties were previously piloted in 2021 by JKUAT and FIND. In 2022, the studies were implemented in four counties: Kilifi, Kisumu, Nakuru and Nyeri. Data was collected from levels 2 to 6 HFs in the four implementation counties. At level 2, data collection was restricted to the high-volume facilities since they are the only level 2 HFs with laboratories.

Diagnostic data was collected in four categories guided by the World Health Organization (WHO) to measure the level of equity and coverage of health services. The four categories include reproductive, maternal, newborn, and child health (RMNCH), communicable diseases (CDs), non-communicable diseases (NCDs), service capacity, and access. Data on Dx tracer indicators were collected using questionnaires and key informant interviews (KIIs) from HFs, health records and information officers (HRIOs), laboratory managers, and other key county staff. Data on workload, the main diseases treated in various HFs, lab requests, and total lab tests carried out were also collected. In addition, data on household out-of-pocket (OOP) expenditure on health care, health-seeking behaviours, and quality of care were collected directly from the community via focus group discussions (FGDs) and questionnaires.

Findings

a) Baseline findings

In a 2021 assessment of diagnostic services for children under five years (U5) and women performed by FIND and JKUAT in Nyeri and Kisumu counties, it was found that children U5 had the longest access distances (average of 24 km compared to 13 km for maternal health diagnostic services) due to specialised diagnostic needs, mostly unavailable at primary care. Notably, for respiratory diseases such as pneumonia, blood culture was non-existent across all levels of care (primary to tertiary) in both counties, and only 9% of facilities offered chest X-rays and 17% full blood count. The combination of high access distance and poor availability of diagnostic services for high-burden diseases may indicate that the syndromic approach to care potentially leads to inappropriate treatment practices impacting the quality of care. Overall, from the baseline study in the two counties, the findings indicated disparities in investment prioritisation based on the epidemiological landscape.

b) Implementation study

Distribution of health facilities in the study counties

The total number of HFs in the four study counties is 1,670, out of which 37.7% (630) are Ministry of Health in Kenya (MoH-K)–owned HFs (41.1% Kilifi, 46.2% Kisumu, 34.2% Nakuru, and 33.3% Nyeri). The study focused on these government-owned HFs. Kilifi and Kisumu counties depend more on government-owned HFs than Nyeri and Nakuru counties, which seem to rely more on privately owned HFs.

Out of the 630 government-owned HFs in the study counties, the study was conducted in 223 (35.4%) HFs. This included all the level 3-6 HFs in the respective counties and high-volume level 2 HFs in each of the counties. The high-volume level 2 HFs were identified with the help of the county teams. Kilifi had the lowest number of HFs, while Nakuru and Kisumu had the highest number of HFs (Table 1).

Table 1: *Number of HFs in the study across the four selected*

Level of HF in the counties	Kilifi	Kisumu	Nakuru	Nyeri
Level 2	14%	26%	21%	39%
Level 3	9%	33%	39%	19%
Level 4	19%	40%	33%	7%
Level 5	n/a	33%	33%	33%
Level 6	n/a	n/a	n/a	100%
Total facilities per county	12%	32%	32%	23%

Capacity of selected diagnostic tests in the study counties

On average, 52.9% of the HFs were confirmed to have capacity indexes that were measured using selected tracer indicators to gauge diagnostic service capacity. Capacities for triage investigations, testing for CDs and NCDs, and investigations on maternal health were weighted and aggregated to formulate this capacity index (Table 2).

Table 2: *Aggregate capacity indices by health facility level based on tracer indicators*

County	Triage Investigations	CDs	NCD	Maternal Health	Aggregated Index.
Kilifi	75.50%	60.50%	31.40%	62.20%	**57.40%**
Kisumu	83.50%	46.60%	20.50%	59.40%	**52.50%**
Nakuru	57.90%	51.80%	25.70%	59.20%	**49.10%**
Nyeri	85.10%	45.60%	23.40%	56.50%	**52.70%**
Aggregated index	**75.50%**	**51.50%**	**25.30%**	**59.30%**	**52.90%**
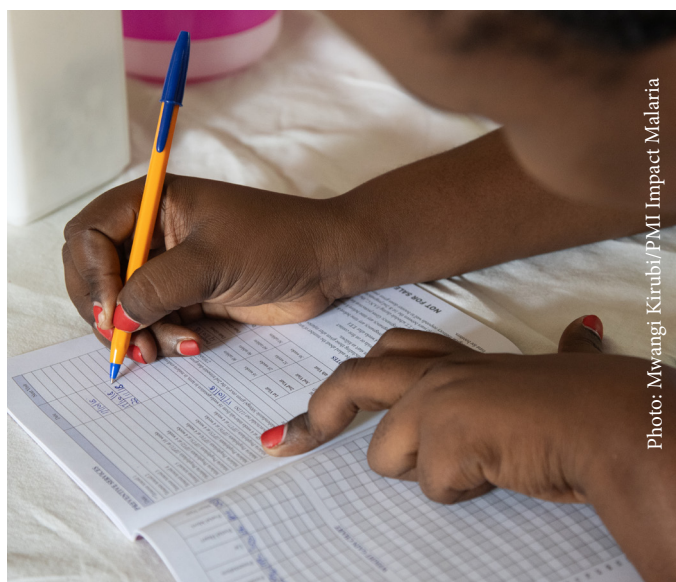
Triage investigation capacity

In Kenya, all the HFs are expected to have triage as a first step in providing care. The triage requirements are a trained triage health care worker, a private room to ensure confidentiality, a desk and two chairs or a couch, a monitor to take vital signs including temperature, BP, RBS, spO2, BMI, and a patient's record chart. Among the facilities assessed, the aggregate capacity was 75.5%, with the largest gap experienced at level 2 HFs. The largest gap for this indicator was recorded in Nakuru county (Figure 1).
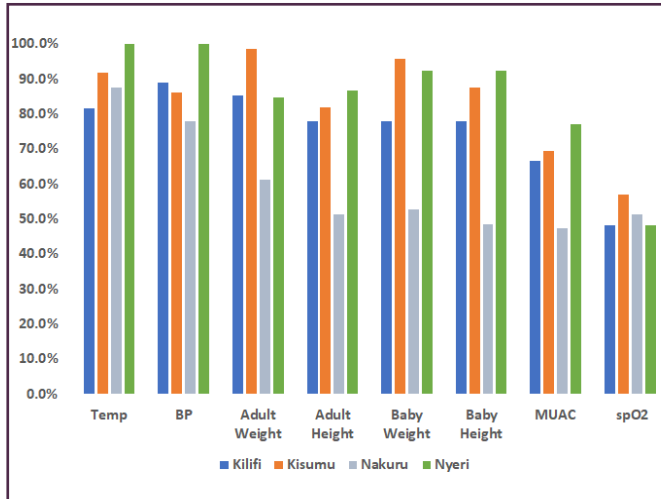
Figure 1: Capacity for triage investigation

Communicable diseases testing capacity

Capacity for diagnostics for communicable diseases in the four study counties scored an aggregate of 51.5%. Kilifi had the highest capacity for this, followed by Kisumu, Nyeri, and Nakuru. Capacities for malaria and HIV were almost 100% in most of the counties. Despite chronic hepatitis B virus (HBV) infection which causes liver cirrhosis and cancer being a major public health concern in Kenya, capacity for diagnosis only averaged 30%.
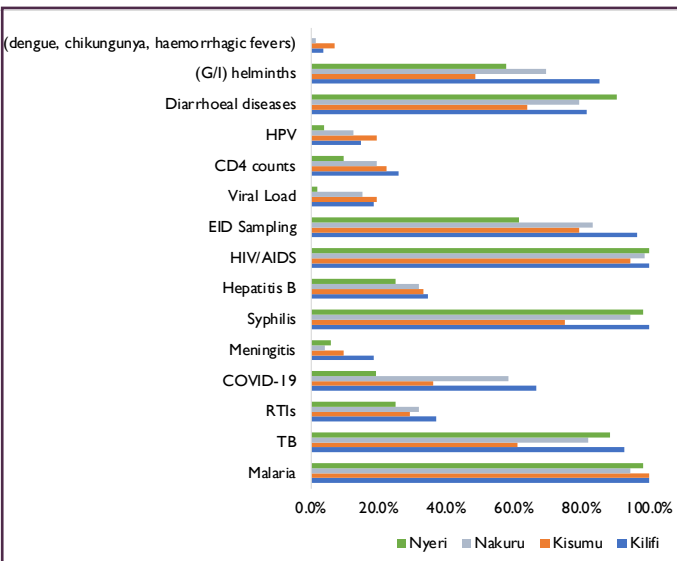

Figure 2: Capacity for testing communicable diseases

Diagnostics for maternal health–related cancers

The capacity of the counties to screen and carry out confirmatory tests for breast and cervical cancers is 59.3%. Most of the facilities in the counties could screen, and only level 5 HFs could carry out confirmatory tests (Figure 3).
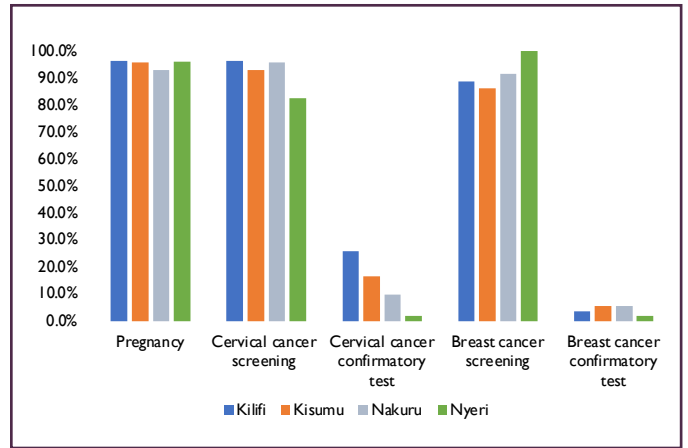

Figure 3: Capacity for diagnosing maternal health-related cancers

Non-communicable diseases testing capacity

The capacity for NCDs diagnostics scored an aggregate of only 25.3%, the lowest among all the indicator areas of interest. Levels 2 and 3 HFs had capacities below 20% even as they form the backbone for the health system in the country. Level 4 had an average capacity below 50% with only the higher levels showing capacity above 70% (Figure 4). Overall, the capacity available was only for tests aligned with antenatal care (ANC) profile.
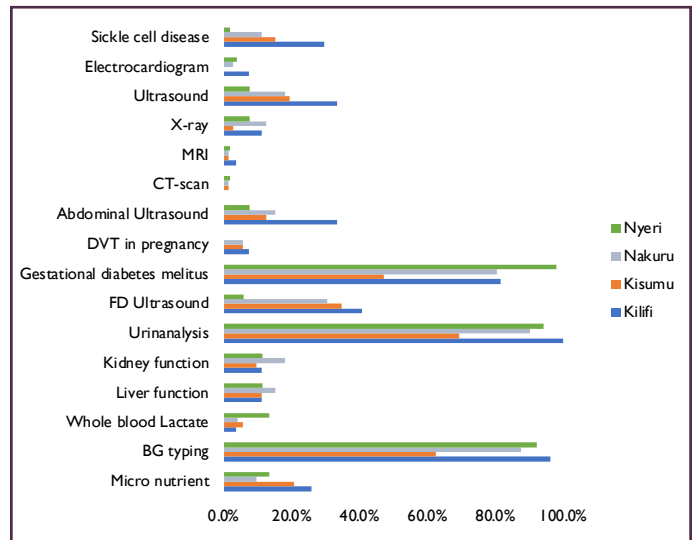

Figure 4: Capacity for diagnosing selected non–communicable diseases


Photo: Marisol Grandon/DFID

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Discussion

Communicable diseases still account for the highest proportion of disease burden in Kenya, with the leading causes related to HIV/AIDS, malaria, and TB. Despite the notable prevalence, the capacity for diagnostics for communicable diseases in the four study counties scored 51.5%.

On the other hand, the weakest link was in the capacity for non-communicable diseases (NCDs). Notably, in all four counties, the tracer indicators under NCDs diagnostics were the HF capacity related to urine analysis, blood group typing, and tests for gestational diabetes mellitus, mainly handled under antenatal care (ANC) profiles. Overall, diagnostic testing for NCDs is the most difficult to obtain for all the counties that participated. This could be attributed to the required equipment and reagents being expensive and highly specialised.

Breast and cervical cancer incidence rates and mortality rates in Kenya are high. Breast cancer leads in incidence with 5,985 new cases annually (12.5% of all new cancer cases) out of all cancers in Kenya. Approximately 12% of all cancer cases diagnosed in Kenya are attributed to cervical cancer, and it is the leading cause of all cancer deaths, with over 3,200 deaths in 2020[3]. Given the importance of these two cancers in Kenya, the capacity gap is 59.3%, indicating low chances of early detection and confirmatory testing.

12.5%
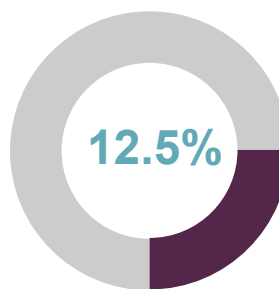
Percentage of breast cancer cases out of all cancers in Kenya annually.

12%
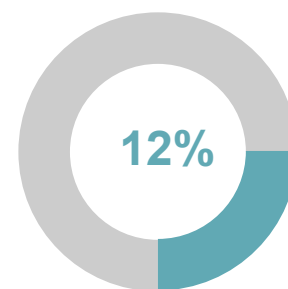
Percentage of cervical cancer cases out of all cancers diagnosed in Kenya annually.

Using various tracer indicators for diseases, the Dx for UHC Tracker platform has created a national diagnostic landscape to generate knowledge that will build long-lasting diagnostic excellence for UHC in Kenya. The platform has brought together government policymakers, public health experts, and communities to build a strong data foundation to support diagnostics and help drive policy change for UHC. Through universal diagnostic tracer indicators, changes in the landscape will be tracked over time to monitor progress toward achieving county and country targets.

Conclusion

There is a need for a reliable diagnostic service that supports a functional and sustainable health system infrastructure to include an effective referral system. The Dx for UHC Tracker platform will assist the Ministry of Health and the counties and eventually, the country to intervene efficiently, equitably, and ethically to achieve the UHC agenda and to ensure all Kenyan citizens live long and healthy lives.

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The evidence brief was summarised from a study conducted by Jomo Kenyatta University of Agriculture and Technology (JKUAT) and Foundation for Innovative New Diagnostics (FIND). AFIDEP supported the project in knowledge translation.

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[3]Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians, 71(3), 209–249.* https://doi.org/10.3322/caac.21660