COLLECTIVE IMPACT REPORT

Blueprint for Innovative Healthcare Access
Building Foundational Systems for Non-Communicable Diseases to Improve Lives in Meru County, Kenya
The Blueprint for Innovative Healthcare Access program was implemented in Meru County, Kenya, from April 2019 through March 2022 (with some activities continuing through the end of 2022) by a consortium of seven partners including Amref Health Africa, Elewa Cancer Foundation, NCD Alliance Kenya (NCDAK), Kenya Medical Research Institute (KEMRI), Kenya Hospices and Palliative Care Association (KEHPCA), and Management Sciences for Health (MSH); Innovations in Healthcare (IiH), a nonprofit organization at Duke University, participated in the consortium as an impact and evaluation advisor. The partners collaborated closely with the public sector including the Kenya Ministry of Health, the Meru County Government and Meru Teaching and Referral Hospital, and the National Cancer Institute of Kenya. The participation of these public sector entities leads to greater opportunities for sustainability.

The authors acknowledge the support of Takeda Pharmaceuticals for funding the Blueprint program, and the leadership of the Amref Health Africa team and Dr. Catherine Kanari for serving as the secretariat of the consortium. We also acknowledge the work and initiative of the principal investigators of the consortium: Joseph Mukoko from MSH, Dr. Catherine Karekezi from NCDAK, Mackuline Atieno from KEHPCA, Dr. Alice Musibi from Elewa, and Dr. Anne Korir from KEMRI. Under their leadership, each partner organization’s dedicated team members implemented program activities, collaborated and communicated across partners, and monitored and evaluated the progress made under the Blueprint project.

We would also like to acknowledge and thank the county leadership, the Meru County health management team and staff who contributed their time and insight into the Blueprint work and for providing valuable feedback for analyzing the impact of the Blueprint. We hope that all partners, stakeholders, and healthcare workers will continue to support the efforts taken during the duration of the Blueprint program to address the burden of NCDs in Meru County.

The authors would like to acknowledge the support of Jayne Waweru and Eunice Mutindi of Innovations in Healthcare and Raymond Muhanji and Lemmy Kiarie of Amref for their work in facilitating interviews with key stakeholders in Meru to collect additional data for this report. We also thank the Meru County health officials and workers who contributed their time to these interviews and the collection of baseline data. We also want to acknowledge the expertise and editorial contributions of Jayne Waweru, Diana Silimperi, and Krishna Udayakumar of Innovations in Healthcare.
### Blueprint Consortium Partners

#### Amref Health Africa (Amref)
Amref works to increase sustainable health access to communities in Africa through solutions in human resources for health services delivery and investments in health. As the secretariat of the Blueprint Consortium and the primary community health partner for the project, Amref’s efforts in the Blueprint included the capacity building and training of community health volunteers (CHVs), the provision of CHV supplies and systems, generating public awareness of NCDs through health broadcast messages to households, and facilitating NCD surveillance through data collection and patient support. Amref also played a role in the strengthening of referral systems and linking CHVs to facilities to enhance patient management.

#### Elewa Cancer Foundation (Elewa)
Elewa educates, supports, and advocates for cancer awareness, screening, treatment and supportive care to clinicians, patients and community at large. In the Blueprint, Elewa trained healthcare providers to identify early signs and symptoms of cancer, and to provide referrals, screening, patient education, patient surveillance, and comprehensive palliative care.

#### Innovations in Healthcare (IiH)
IiH seeks to increase access to quality, affordable healthcare worldwide by scaling leading innovations. In 2019, IiH developed the Access to Health Impact Measurement Framework to support the measurement and evaluation of private-sector supported global health programs and piloted the framework with the Blueprint Consortium. IiH served as an impact and evaluation advisor to the Blueprint Consortium.

#### Kenya Hospices and Palliative Care Association (KEHPCA)
KEHPCA promotes access to quality palliative care for all in need across Kenya. In the Blueprint, KEHPCA sought to create awareness and advocacy for palliative care in Meru County, build capacity of healthcare workers to deliver palliative care, and strengthen referral systems to palliative care services for those living with palliative care needs.

#### Kenya Medical Research Institute (KEMRI)
KEMRI improves human health and quality of life through research, capacity building, innovation and service delivery. The organization’s central role in the Blueprint was to establish both hospital-based and population-based cancer registries in Meru County to improve cancer surveillance and research in Meru County. KEMRI also led efforts to train registry technicians to collect, verify, and upload quality cancer data into the registries.

#### Management Sciences for Health (MSH)
MSH partners with the Kenyan government, local health leaders, and service providers to strengthen health systems through improving health financing to effectively implement programs that improve pharmaceutical and laboratory systems, health information, and the capacity of healthcare workers. In the Blueprint, MSH sought to strengthen Meru County’s commodity stewardship for NCD health products and technologies, health worker capacity for inventory management, capacity for information acquisition and use for decision making, and to strengthen accountability mechanisms through end to end visibility of commodity data.

#### Non-Communicable Disease Alliance of Kenya (NCDAK)
NCDAK facilitates active promotional and advocacy activities for the prevention and control of non-communicable diseases and the provision of quality NCD services. NCDAK’s objectives for the Blueprint were to implement effective NCD prevention and control policies, WHO Best Buys, and increase Meru County budget allocations for NCDs. They also sought to improve the efficiency of Meru County’s health system to provide optimal management of diabetes and hypertension.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AWP</td>
<td>Annual Work Plan</td>
</tr>
<tr>
<td>CanReg5</td>
<td>Cancer Registry version 5</td>
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<tr>
<td>CHWs</td>
<td>Community Health Workers</td>
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<tr>
<td>CHVs</td>
<td>Community Health Volunteers</td>
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<td>HCPs</td>
<td>Healthcare Providers</td>
</tr>
<tr>
<td>HCWs</td>
<td>Healthcare Workers</td>
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<tr>
<td>HPTs</td>
<td>Health Products and Technologies</td>
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<tr>
<td>IiH</td>
<td>Innovations in Healthcare</td>
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<td>KECHN</td>
<td>Kenya Enrolled Community Health Nurse</td>
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<td>KEHPCA</td>
<td>Kenya Hospices and Palliative Care Association</td>
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<td>KEMRI</td>
<td>Kenya Medical Research Institute</td>
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<td>KEMSA</td>
<td>Kenya Medical Supplies Authority</td>
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<td>KHIS</td>
<td>Kenya Health Information System</td>
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<td>KHPC</td>
<td>Kenya Housing and Population Census</td>
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<td>KRCHN</td>
<td>Kenya Registered Community Health Nurse</td>
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<td>MSH</td>
<td>Management Sciences for Health</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<td>NCD</td>
<td>Non-Communicable Disease</td>
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<td>NCDAK</td>
<td>Non-Communicable Disease Alliance of Kenya</td>
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<td>NCI</td>
<td>National Cancer Institute</td>
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<td>PI</td>
<td>Principal Investigator</td>
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<td>ToT</td>
<td>Trainer-of-Trainers</td>
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<td>UHC</td>
<td>Universal Health Coverage</td>
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<td>WHO</td>
<td>World Health Organization</td>
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I. EXECUTIVE SUMMARY

The Blueprint for Innovative Healthcare Access program (Blueprint program) launched in 2019 to improve survival and quality of life for people impacted by non-communicable diseases (NCDs) – diabetes, hypertension, and cancer – in Meru County, Kenya, by strengthening high-quality, integrated, and consistent local healthcare capacity and capabilities across the patient journey. A consortium of seven partners implemented activities over the course of three years to achieve eight collective impact objectives: strengthen health system delivery capacity; increase community awareness of NCDs; improve access to and utilization of health services; improve earlier detection of NCDs; improve disease surveillance and research to facilitate evidence-based decision making; improve availability of NCD products and technologies; increase funding for NCDs in Meru County budget; and, improve quality of life for Meru residents with NCDs.

Meru County’s population of 1.54 million face a growing burden of NCDs amongst an increasingly expanding adult population. In 2019/2020, according to the Meru County Government Department of Health, nearly 116,000 cases of hypertension, diabetes, and cancer were reported in Meru, with hypertension rapidly becoming the most prevalent NCD in the county. The Blueprint program worked with the county government to build the capacity of healthcare facilities to address NCDs across Meru County and enhance the health workforce for NCDs at each level of the health system.

Methods

The consortium partners used the Access to Health (ATH) framework to structure their program evaluation plans and to help measure the intended impact of their activities. The ATH framework supports the design, delivery, and evaluation of global health programs.* It is a roadmap to enable greater outcomes and impact measurement and reporting. The framework provides an organized structure that enables assessment across three domains that are key to driving greater impact: health system context or environment, health activity or therapeutic area, and patient or individual/community experience.

Evaluation plans were developed for each partner, with indicators, outputs, and outcomes identified for their activities. In order to measure the collective impact of the partners’ efforts, all partner indicators were aggregated into categories of similar outcome areas. Based on that aggregation, seven collective impact objectives were identified (below), reflective of the different areas of work the Blueprint Consortium has undertaken. Data from these indicators was also subsequently aggregated to understand the quantitative impact of the Blueprint Consortium as a whole. This data and analysis for impact was supported through qualitative interviews with leading local health stakeholders that provided baseline context and growth stories of NCD health services in Meru County.

Results of the Blueprint are organized by domain focal areas: health infrastructure and delivery capacity for NCDs, and NCD prevention, screening, treatment and care. Figure 1 below depicts the activities of the consortium and the results of their efforts from 2019 to 2022. For the purposes of this report, our use of the term impact refers to the results of the three-year Blueprint program’s activities; it does not equate to long-term outcomes, the definition of impact according to the traditional monitoring and evaluation field. Though, when referring to the specific Access to Health Impact Measurement Framework, we equate the term impact to long-term outcomes.

*The eighth impact objective is not included in this report as data collection on this indicator ultimately proved infeasible in the time period of the program.

Results

Results of the Blueprint are organized by domain focal areas: health infrastructure and delivery capacity for NCDs, and NCD prevention, screening, treatment and care. Figure 1 below depicts the activities of the consortium and the results of their efforts from 2019 to 2022. For the purposes of this report, our use of the term impact refers to the results of the three-year Blueprint program’s activities; it does not equate to long-term outcomes, the definition of impact according to the traditional monitoring and evaluation field. Though, when referring to the specific Access to Health Impact Measurement Framework, we equate the term impact to long-term outcomes.

*The eighth impact objective is not included in this report as data collection on this indicator ultimately proved infeasible in the time period of the program.

Figure 1: Summary of Blueprint Goals, Focus Areas, Activities, and Impact

**Focus Areas**

1. Health Infrastructure and Delivery Capacity for NCDs

   - Strengthen health system delivery capacity
   - Improve disease surveillance and research to facilitate evidence-based decision making
   - Increase funding for NCDs in the county budget
   - Strengthen structures supporting commodities management

2. NCD Prevention, Screening, Treatment, and After Care

   - Increase community awareness for NCDs
   - Improve access to and utilization of health services
   - Improve earlier detection of NCDs
   - Improve quality of life*

**Activities & Impact**

**Health System Delivery Capacity**

- 890 individuals with strengthened knowledge and skills for preventing, detecting, and treating diabetes, hypertension, cancer, and providing palliative care (1,258 unique individuals trained and assessed)

**Commodities and Supply Chain Management**

- 200 individuals trained on effective commodities management
- Decreased the stockout of NCD medicines by 35%
- Developed and disseminated 20,000 job aids on commodities management
- Developed and implemented reporting systems for national rollout of NCD products
- Purchased glucometers, 1,000 automated BP machines, and 300 smartphones

**Policy and Financing**

- 523 people living with NCDs trained in county budget process

**Disease Surveillance and Data Collection**

- Established the first population-based and five hospital-based cancer registries in Meru County
- 5,721 verified cancer cases uploaded to Meru population cancer registry

**Community Awareness**

- 365,470 community members received educational materials on NCDs

**Access to Health Services and Earlier Detection of NCDs**

- 156,965 people screened for hypertension and diabetes, with 9,731 referrals
- 319% increase in uptake of palliative care services from 2019 to 2022 in Meru county

GOAL: To strengthen the capacity of Meru County’s health system to address NCDs
Limitations

Several limitations and challenges have impacted the results of the Blueprint, particularly the original program design, data, and external factors beyond the control of the implementing partners. The primary limitation with regard to program design was the onboarding of the evaluation advisor nine months after the start-up of the Blueprint, which resulted in delayed development, or in some cases refinement, of the collective impact objectives and evaluation plan and partner-specific expected outputs, outcomes, and monitoring indicators. Data limitations included differences in data reporting from partners for similar activities; limitations in data access influenced how screening, referral, and treatment data was reported for hypertension, diabetes, and palliative care; a minimal number of outcomes achieved and reported due to the short program timespan; and, baseline data was collected retrospectively, likely introducing recall bias into the results. Finally, external factors such as infrastructure changes at the national level, resource limitations, nursing strikes, and COVID-19 all impacted service delivery and program implementation.

Recommendations

This work has yielded a variety of learnings and insights for working with a consortium of partners. From these learnings we have identified four key recommendations for future program implementers and funders of these important activities.

1. Set up evaluation plans at the beginning of a program, with considerations for sustainability and scalability incorporated.

2. Be flexible to adapt programmatic approaches as needed to account for external factors.

3. Communicate progress and results effectively and frequently to identify gaps, best practices, and make course corrections.

4. Establish strong leadership at the consortium level to facilitate a unified approach for reaching program objectives.

Sustaining Impact

A benefit of working as a consortium is the ability to leverage collective work and expertise to generate results, buy-in, and motivation, for lasting change. Educating the health workforce through a variety of trainings strengthened community knowledge and skills to address NCDs and implement related health system activities. Systems strengthening activities, including data infrastructure and reporting, advocacy, research, and tools and practices for commodities management, built the foundation for NCD management and can be enhanced over time. As a result of discussions with the partners, the following five themes were identified as areas of Blueprint impact that may be feasible to sustain over time.
A large portion of the Blueprint work was in support of strengthening the knowledge-base of healthcare workers involved in NCD care and supporting systems, from community volunteers through hospital providers. Educating the full range of health workers, across all cadre involved in NCD prevention, care, and treatment, should have lasting effects on Meru’s health system and in communities across the county, particularly for those individuals who are retained in the health system.

Working closely with Meru County government and local public health system leaders, the Blueprint has generated significant momentum and buy-in to continue to support NCD prevention and control mechanisms in Meru.

Engaging with national entities like the Ministry of Health, or the Department of NCD’s Division of Health Products and Technologies, or other institutions and regional entities like the Africa Cancer Registry Network created strong support and leadership for consistency, buy-in and validation of the Blueprint work locally, nationally and regionally.

Throughout the Blueprint program, NCD systems building and strengthening, such as the creation of a population-based cancer registry and training of healthcare workers in identifying hypertension, has been at the crux of the objectives of the consortium. New opportunities now exist to build from these foundations for greater impact.

Programs are typically sustained with continued funding for activities. In the case of Blueprint, new funding is deepening the impact of partner efforts by leveraging the same cancer curriculum developed under Blueprint with new cadres of health workers. Meru County NCD support groups are generating their own funding to sustain their efforts in the community.

**Impact Summary**

As the original Blueprint activities come to a close, the results highlight the success of a collective approach to **building a foundation** that will address the growing health burden of NCDs in Meru County. Training health providers, both clinically licensed professionals and community health volunteers, has increased the capacity for preventive and responsive NCD care. Commodities management capacity strengthening provided additional support to care providers and patients, ensuring improved access to and confidence in medicines and supplies. Advocacy efforts to ensure ongoing support for NCDs, via funding or policies or both, were influenced by the availability of timely, quality data, which was made possible by the concerted efforts of the Blueprint to set up and support the collection, cleaning, and regular reporting of NCD data.

While all activities concentrated on Meru, materials and approaches emanated from national guidelines and procedures to provide consistency and scalability. Use of approved MoH curricula, and national-level advocacy for NCD policy and funding, set the stage for continued expansion of efforts within Meru County, but also potentially for other counties and nationally. The success of the Blueprint laid the groundwork for future programming to continue to alleviate the NCD burden in Meru, Kenya, and beyond.
Non-communicable diseases (NCDs) are the leading causes of morbidity and mortality globally, accounting for 41 million deaths a year: 74% of all deaths globally. Cancer, cardiovascular disease, and diabetes disproportionately impact low- and middle-income country populations. An estimated 80% of NCDs are largely preventable if action is taken to address their modifiable risk factors, especially when prioritizing the poorest and most vulnerable populations. The World Health Organization (WHO) estimates that 77% of all NCD deaths are in low- and middle-income countries, a rate that is expected to worsen as NCDs remain underfunded and unaddressed.

Kenya, a lower middle-income country, faces an increasing burden of both infectious diseases and NCDs, primarily cancer, cardiovascular diseases, diabetes, mental illness, and chronic respiratory diseases. NCDs are rapidly becoming a significant threat to health in Kenya, accounting for 50% of all hospital admissions, 55% of hospital deaths, and 33% of total deaths in the country. It is estimated that deaths due to NCDs will outpace the number of combined deaths from communicable diseases and malnutrition by 2030.

Meru, a rural county located in central Kenya, faces a significant need to build and strengthen the capacity of the county’s health system to prevent, control, and treat NCDs. Low community awareness of NCDs and limited access to NCD treatment and care compromise timely diagnosis, treatment, and care in Meru. Individuals are often diagnosed when secondary complications of NCDs are present due to a lack of community-level NCD diagnosis, treatment, and care capacity. The high out-of-pocket expenditure on NCD care as a result of historical underinvestment in NCD infrastructure and care in Meru is a heavy burden on patients, further driving families into poverty.

The aging population, limited capacity of the health workforce and health infrastructure for NCDs, along with increasing prevalence of diabetes, hypertension, and cancer, all contributed to the urgent need for stronger systems and a better prepared workforce to address this growing burden of NCDs in Meru. Launched in 2019, the Blueprint for Innovative Healthcare Access program (Blueprint program), implemented by a consortium of seven organizations (Blueprint Consortium), aimed to improve survival and quality of life for people in Meru County impacted by NCDs - diabetes, hypertension, and cancer - by strengthening high-quality, integrated, and consistent local healthcare capacity and capabilities across the patient journey.

With its focus on capacity and infrastructure-strengthening, the Blueprint Consortium and public health sector collaborators built a strong foundation for NCD prevention and management. This report provides insight into the health context of Meru County and the results of the three-year Blueprint program on the health workforce, systems, and population of Meru. Findings from this report will be helpful for scaling or expanding this program to other counties in Kenya. Findings can also help in the design of future programs seeking to understand and translate their impact.
III. MERU COUNTY CONTEXT

Population Demographics and NCD Burden

The Kenya Housing and Population Census (KHPC) conducted in 2019 indicated that Meru County had a population of 1,545,000 people with a growth rate of 2.1% per year and 426,360 households. People between the ages of 25 and 59 make up 34.5% of the Meru County population, resulting in a significant need to address NCDs in both Meru County and Kenya as a whole, as this population ages and becomes more susceptible to these chronic diseases. It is estimated that within the next few decades, the adult demographic will increase significantly and demand for NCD services will exceed current needs and capacity.

Table 1. Meru County Population Data

<table>
<thead>
<tr>
<th></th>
<th>Distribution of Population, Number of Households, and Average Household Size</th>
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<tbody>
<tr>
<td></td>
<td>Total Population</td>
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<tr>
<td></td>
<td>1,545,714</td>
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<table>
<thead>
<tr>
<th>Population Demographics</th>
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<tr>
<td>615,385</td>
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<tr>
<td>39.9%</td>
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As described in the original Blueprint proposal for Meru County in 2019, the NCD situation in the county was dominated by low NCD awareness, nonexistent or inefficient NCD prevention strategies, overburdened health facilities with limited or no diagnostic capabilities, and an inadequately funded and structurally challenged health system, unable to meet the expected demand of the growing number of patients with NCDs in the next 15-20 years. Meru’s growing adult population offered an opportunity to intervene and minimize the onset and severity of NCDs through encouraging modifiable behaviors for risk factors and increasing preventative services available in the county.

Since 2016, county government reported case numbers in Meru County for both hypertension and diabetes have trended upward. Of the three NCDs targeted in the Blueprint program, hypertension is the most prevalent in Meru County, with 88,190 confirmed cases in the 2019-2020 period. Cancer is another NCD appearing to be on the rise in Meru, from 323 cases reported in 2018/2019 to 573 in 2020/2021. Prior to the Blueprint program, local health leadership sources indicated there was no capacity for early cancer diagnosis and referral in Meru County, possibly resulting in an undercounting of cancer cases reported over the years.

Table 2. NCD Prevalence in Meru County

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<thead>
<tr>
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<tbody>
<tr>
<td>Diabetes</td>
<td>21,279</td>
<td>27,168</td>
<td>24,664</td>
</tr>
<tr>
<td>Hypertension</td>
<td>69,160</td>
<td>88,190</td>
<td>67,884</td>
</tr>
<tr>
<td>Cancers</td>
<td>323</td>
<td>577</td>
<td>573</td>
</tr>
</tbody>
</table>

*Numbers above represent the available data reported in Meru County for public health facilities. Patients who go to private clinics are not reported.*
Health Infrastructure and Workforce

According to the County Government of Meru Non-Communicable Diseases Annual Workplan 2021-2022, of the 543 operational health facilities in Meru County in 2019, 176 (32%) are public facilities. The Blueprint program took place across multiple sub-counties at different levels within the health system, working only within the public domain and in the public facilities located in Meru County.

According to the latest data from 2019, Meru County government employs 2,702 health care workers, working in various capacities across the different levels of health facilities. The health care workforce represents a variety of personnel and roles including consultants, medical officers, pharmacists, clinical officers and nursing staff. The largest cadre of healthcare workers are CHVs who play an integral role in both Meru County and Kenya’s health systems.

The Blueprint interfaced with many of these workforce cadres, but predominantly focused on CHVs. Typically across the country, a CHV serves roughly 100-500 individuals each month through household visits and refers community members to health facilities, shares health promotion messages, and monitors chronic health conditions. As of September 2021, Meru County had roughly 2,944 CHVs in its workforce, a 43% increase in staff from 2019 county reports. CHVs report to the county government and work on a voluntary basis without remuneration, though recent advocacy efforts by consortium partners and others have succeeded in convincing the county government to provide 2,000 CHVs with a quarterly stipend of 5,000 Kenyan shillings (KSH).
The Blueprint Consortium implemented a variety of activities across the county to strengthen the capacity of Meru County’s health system to address NCDs.

A central focus of all partners included the training and skills enhancement of Meru health workers, defined broadly as any individual working to improve health. Trainings took place on the management and referral processes for hypertension and diabetes and the early identification of cancer, in addition to palliative care, advocacy trainings, and trainings on data collection and commodities management. The variety of trainings performed by Blueprint partners are described in Table 3.

Table 3. Type of Trainings Conducted by Topic

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>TRAINING ACTIVITIES</th>
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</table>
| Cancer                     | • Health care providers (HCPs) and CHVs trained on integrated in-service cancer management curriculum on early identification and diagnosis of breast, cervical, prostate, and GIT cancer  
                           - Followed up by supervision and mentorship for skills training  
                           • CHVs and trainer-of-trainers (ToTs) trained on cancer topics through the mHealth (LEAP) platform  
                           - Post-training assessment with 80% pass mark                                                                                                              |
| Hypertension & Diabetes    | • CHVs trained on diabetes management and referral processes, including use of diabetes management equipment  
                           - Post-test on hypertension and diabetes management and referral processes  
                           • HCPs trained on hypertension and diabetes management and referral processes  
                           - Post-test on hypertension and diabetes management and referral processes  
                           • CHVs and ToTs trained on hypertension and diabetes topics through the LEAP platform  
                           - Post-training assessment with 80% pass mark  
                           • CHVs and ToTs trained on blood pressure machines and glucometers for screening of hypertension and diabetes  
                           - Post-training assessment on blood pressure machines and glucometers skill                                                                                       |
| Palliative care            | • CHVs and HCPs trained on palliative care provision  
                           - Knowledge and skills assessment on palliative care provision following completion of training  
                           • Continued mentorship of HCPs post-training                                                                                                                |
| Financing & advocacy       | • Community members, including people living with NCDs, trained on county budget-making processes, advocacy skills, and public participation                                                                                 |
| Data collection & commodities management | • Cancer registry trainings for health workers  
                           - Both pre-training and post-training assessments administered on case identification, data abstraction, cleaning, entry, and analysis  
                           - Mentorship program for trained cancer registry personnel  
                           • CHVs trained on screening and referral data collection through the Mjali data platform  
                           • Health workers trained on commodity management of health products and technologies including quantification, inventory management, pharmacovigilance and rational use. |
Blueprint partners also focused their efforts on **policy and budget advocacy**, awareness generation, and improving the health system infrastructure. Advocacy efforts to enact a bill remunerating CHVs and prioritizing and financing NCDs within the county included leading meetings with both the community and Meru County Assembly, writing policy proposals, and conducting trainings on the budget-making process.

Technical support and collaborative efforts on data collection, management, and reporting served as essential activities to strengthen the health system by recording and generating high quality data to inform decisions. Data systems were set up to track the supply of health products and technologies (HPTs) and trained health workforce personnel collected data to enhance NCD commodities management, improve access to products, and strengthen accountability mechanisms. Disease-specific data collection, in this case for cancer, was facilitated through the establishment of hospital-based patient registries that feed into the newly established population-based Meru Cancer registry, improving the capacity for cancer surveillance.

The partners’ intended impacts of these activities are listed below.

**Table 4. Blueprint Partner Intended Goals**

<table>
<thead>
<tr>
<th>PARTNER</th>
<th>INTENDED GOAL</th>
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<tr>
<td>Elewa</td>
<td>• Enhance capacity for early cancer detection and referral to treatment in Meru County through training of primary healthcare providers</td>
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<tr>
<td>KEHPCA</td>
<td>• Improve access to palliative care services for people living with palliative care needs in Meru County</td>
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</table>
| KEMRI   | • Improve capacity for generation and access to quality cancer data to support research and evidence based decision-making  
|         | • Improve cancer surveillance, research and dissemination to support evidence based decision-making |
| NCDAK   | • Implement effective NCD prevention and control policies, WHO Best Buys, and increase Meru County budget allocations for NCDs  
|         | • Improve the efficiency of the health system to provide optimal management of diabetes and hypertension |
| AMREF   | • Improve NCD health literacy (cancer, diabetes, hypertension), and improve preventative & health seeking behaviors of community members in Meru County  
|         | • Reduce morbidity and mortality of hypertension and diabetes through early detection of disease or risk factors in Meru County |
| MSH     | • Strengthen county commodity stewardship capacity for NCD health products and technologies  
|         | • Strengthen NCD commodity inventory management systems  
|         | • Strengthen capacity for NCD commodity information acquisition and use  
|         | • Improve NCD health products and technologies accountability mechanisms  
|         | • Advocate for increased budget for NCD health products and technologies |
V. BLUEPRINT IMPACT MEASUREMENT METHODOLOGY

The consortium partners used the Access to Health (ATH) framework to structure their program evaluation plans and to help measure the intended impact of their activities. The ATH framework supports the design, delivery, and evaluation of global health programs.\(^2\) It is a roadmap to enable greater outcomes and impact measurement and reporting. The framework provides an organized structure that enables assessment across three domains that are key to driving greater impact: health system context or environment, health activity or therapeutic area, and patient experience.

Each partner developed an evaluation plan by identifying the key objectives of their work, followed by describing the structures, processes, and outcomes of the planned activities and intended results. These structures and processes were organized in an evaluation template (Appendix 2). Indicators were developed for each identified output and outcome as a means to measure progress towards program objectives. A summary list of indicators can be found in Appendix 3.

**Data Collection and Reporting**

Each partner reported data to the impact and evaluation advisor each quarter of the three years of the program (12 quarterly data reports; see Appendix 4 for quarterly reporting schedule), or during the total amount of time the partner participated in the program. Data reporting templates listed programmatic activity indicators, including fields for numerators and denominators where relevant to calculate percentages. The data was reviewed, quality-checked each quarter, and revised as necessary after consultations between each implementing partner and the impact and evaluation advisor. In addition to the quarterly quantitative data, qualitative data from meetings and activity reports offered additional insight and context for the quantitative data.

In order to measure the collective impact of the partners’ efforts, all partner indicators were aggregated into categories of similar impact, structured around the three domain areas of the ATH framework. Based on that aggregation, eight “collective” impact objectives were identified for the Blueprint Consortium (Figure 7). Using these impact objectives, the most relevant indicator(s) were selected, those determined to best measure change or impact at the consortium level. The selected indicators are generally measuring short-term outcomes, as longer term outcomes were not attainable during the duration of this grant (Table 4).

**IMPACT:**

For the purposes of this report, our use of the term impact refers to the results of the three-year Blueprint program’s activities; it does not equate to long-term outcomes, the definition of impact according to the traditional monitoring and evaluation field. Though, when referring to the specific Access to Health Impact Measurement Framework, we equate the term impact to long-term outcomes.
To supplement the quantitative data and provide additional context, qualitative data was collected via semi-structured interviews with nine public and private sector stakeholders representing different areas and levels of the Meru health system. Interviewees included the Meru Director of Medical Services, Director of Public Health, the County NCD Coordinator, the Meru County CHV Supervisor, the Chief Officer for Health and Medical Services, a county pharmacist, county health workers, a hospice representative, and health records officers. Interviews focused on filling data and content gaps related to the context of the health system prior to the Blueprint work, in order to support an analysis of the changes that had taken place in Meru County since 2019, the onset of the Blueprint program.

Table 5. Example of Blueprint activities addressing a consortium impact objective and associated indicators

<table>
<thead>
<tr>
<th>IMPACT OBJECTIVE</th>
<th>ILLUSTRATIVE HEALTH SYSTEM DELIVERY CAPACITY-STRENGTHENING ACTIVITY</th>
<th>ILLUSTRATIVE INDICATORS</th>
</tr>
</thead>
</table>
| Strengthen health system delivery capacity | • Training of healthcare workers on screening and management of diabetes and hypertension, cancer, or palliative care  
• Four of the six partners undertook such training activities | Percent of healthcare workers passing their post-training assessments:  
\[
\frac{\text{Number of HCWs passing}}{\text{Number of HCWs trained}}
\] |
| Improve access to and utilization of health services | • Screening and referral of patients for diagnosis and treatment  
• Four of six partners conducted screening and referral activities to link people to care | • Number of people screened for relevant NCD (cancer, hypertension, diabetes)  
• Percent of people referred to care after screening:  
\[
\frac{\text{Number of people referred to facility for diagnosis}}{\text{Number of people screened}}
\] |
At the outset of the Blueprint, partners collectively identified a set of ambitious, visionary goals for NCDs in Meru County, including improvements to quality of life and cancer survival rates. The short program timeframe and activity design focused primarily on capacity-strengthening of health workers hindered the Consortium's ability to attain these original visionary goals. In addition to these constraints, other factors like the COVID pandemic, beginning after only one year of program implementation, also adversely affected activities and subsequent results. Following the first year of program implementation, and recognizing these constraints, goals and objectives were modified to be more feasible and realistic to the timespan available for implementation and measurement. The resulting adjusted objectives focused on building the foundation to support the systemic delivery of NCD prevention and care, positioning Meru County to address chronic disease and quality of life in its population going forward.

The results of the Blueprint Consortium’s efforts are organized according to their impact objectives. The focus of the first grouping of objectives, Health Infrastructure and Delivery Capacity for NCDs, includes the results of trainings for health providers, commodity management and supply chain, policy and financing, and disease surveillance and data collection, which make up a significant portion of the infrastructure and capacity needed to address NCDs. The second grouping of objectives, NCD Prevention, Screening, Treatment, and After Care, focuses on the results of the Blueprint’s efforts to support the community and individuals in preventing NCDs, identifying those at-risk, and supporting those with known disease.

Health Infrastructure and Delivery Capacity for NCDs

Prior to Blueprint, Meru County health officials noted that the public health system did not have the capacity, infrastructure, or the budget to address NCDs. County health records staff also described an insufficient infrastructure for NCD diagnosis, referral, care, and related data collection. For NCD commodities and medicines, a pharmacist for the county highlighted the absence of pharmaceutical supplies for hypertension and diabetes across Meru until 2019.

**STRENGTHEN HEALTH SYSTEM DELIVERY CAPACITY**

**Clinical Capacity Strengthening and Training for Health Workers**

Training activities were fundamental to the Blueprint program, spanning across the health continuum from trainings on NCD screening to palliative care provision. Trainings were targeted primarily at CHVs and HCPs. Prior to Blueprint, according to local sources, a majority of CHVs in Meru County lacked NCD knowledge and were not capable of screening for NCDs or referral for diagnosis and/or treatment.

Under the Blueprint, training activities on diabetes, hypertension, cancer and palliative care strengthened the knowledge and capacity of 890 health workers, who passed post-training assessments (a 71% pass rate out of 1,258 unique individuals trained and assessed). Training was conducted through virtual and in-person sessions, and included hands-on training. Most Blueprint trainees were assessed with a post-training written assessment, sometimes also complemented with a skills-based assessment. A total of 1,399 unique individuals were trained (1,258 trained and assessed) in cancer, hypertension, diabetes, and palliative care (155 HCPs and 1,244 CHVs). However, as individuals were able to participate in more than one training topic, cumulatively, 2,516 people participated in topic-specific trainings (non-unique).
By topic, 1,099 were trained on cancer (1060 CHVs, 39 HCPs), 1,196 were trained on hypertension and diabetes (1,139 CHVs, 57 HCPs), and 164 on palliative care (105 CHVs, 59 HCPs*), with 57 additional HCPs participating in further training on pediatric palliative care.

Integrated in-service cancer management trainings improved the knowledge and skills of HCPs in the early identification of breast, cervical, prostate, and gastrointestinal cancer signs and symptoms and referral to specialists, with a 94% average knowledge assessment pass rate (37 passing out of 39 trained). These HCPs developed their skills further through continued mentorship and on-the-job Supervision. Cancer trainings on early identification and diagnosis also expanded the number of HCPs trained on cancer in Meru from 1 oncology consultant to 39 HCPs. As a result of these trainings, partners advocated for and helped create an oncology curriculum that the Kenyan Ministry of Health (MoH) intends to incorporate into primary healthcare training for care providers in oncology.

**Impact Objective 2**

**IMPROVE DISEASE SURVEILLANCE AND RESEARCH TO FACILITATE EVIDENCE-BASED DECISION MAKING**

**Disease Surveillance and Data Collection**

Blueprint activities for disease-specific data collection in Meru focused on enhancing the capacity of health facilities to collect and report cancer data. The Consortium advocated for support and resource allocation to cancer registry activities among the county leadership, policymakers, and healthcare facility managers. Prior to Blueprint, according to local sources, no electronic database existed in which to report cancer data in Meru County. No staff worked specifically on cancer registry and data management, and there was no software available for digital data collection. When cancer data was previously collected, medical records staff initially used paper records to track information and cancer data was not separated from other medical records.

**Capacity Strengthening for Data Management**

Through Blueprint partner activities, more than 35 medical records staff were trained and mentored from five level 3-5 healthcare facilities in Meru to improve the county’s capacity to generate quality cancer data by digitizing paper-documented cancer cases for abstraction and upload to the cancer registry. Regular mentorship of the Meru medical records staff following the conclusion of these trainings improved the data cleaning, collection, and categorization of Meru cancer data. These efforts contributed to the upload of 5,721 verified cancer cases to the Meru County registry during the Blueprint program period.

**Infrastructure Development and Strengthening Data Management**

Collaboration between Blueprint partners and the government established the first Meru County population-based cancer registry and five hospital-based cancer registries that will strengthen local, national, regional, and international cancer surveillance. Hospital administration and health records staff were sensitized on the importance of proper documentation of cancer cases to improve the filing system. These staff can now collect quality cancer data with minimal supervision. Meru County has also hired and engaged personnel to focus on cancer registry work, sustaining the progress made under the Blueprint project to improve and increase cancer data collection in the county.

INCREASE FUNDING FOR NCDs IN THE COUNTY BUDGET

Policy and Financing

Trained health workers, community members, and county leadership in Meru participated in activities such as writing policy proposals and completing trainings on the budget-making process to improve NCD policy and financing in the county. Partners trained 43 people living with NCDs as trainers-of-trainers (ToTs) from all sub-counties in Meru, who then educated 480 community members and other people living with NCDs on county budget-making processes. Blueprint partners and others advocated for and helped to secure funding for 2,000 CHVs through a quarterly KSH 5,000 stipend provided by the Meru County government. CHVs that were trained through Blueprint activities now have a sustained salary from the government that will support their continued efforts in the community.

Increased NCD awareness in Meru, in part due to the Blueprint’s advocacy and awareness generation efforts, may have also contributed to the allocation of KSH 5 million for NCD education and awareness in the community in the 2022-2023 county budget. Before Blueprint’s efforts, there were minimal funds allocated in the county budget for NCD commodities and no financing for programmatic support for NCDs in Meru. According to local sources, Level 2 and 3 health facilities relied on county and donor grants to support NCD infrastructure. The first NCD-specific annual work plan for Meru County was facilitated and supported by Blueprint partners and will serve as an instrumental planning and policy document for the county budget, and specifically address allocation of funds for NCD interventions and resource mobilization. Both the quarterly stipend for CHVs and the development of the NCD work plan show a strengthened commitment from Meru’s government to improve their health system’s capacity to address NCDs.

STRENGTHEN STRUCTURES SUPPORTING COMMODITIES MANAGEMENT

Capacity Strengthening and Advocacy for Commodities Management

According to a Meru County pharmacist, prior to 2019 there were gaps in practices and procedures for effective management of health products and supplies (commodities) in health facilities across Meru County. This was especially true in level 1 and 2 facilities that were not traditionally expected to manage commodities and as such, had little or no defined practices and procedures to manage commodities. See Appendix 1 for a description of facility levels. It was observed by health system leadership that many staff at these facilities, despite having awareness of commodities management, lacked adequate skills to undertake commodities management activities. Commodities reporting was not supported in Meru, and there was no central mechanism to record and monitor commodities data across facilities. Under the Blueprint, the County Medicines and Therapeutics Committee and the County Commodity Security Technical Working Group were reactivated to increase the pool of health workers trained on commodities management, including both medicines, and therapeutics. These committees helped to recruit 200 health workers that were trained on inventory and commodity management for NCD HPTs, with an average of 40 health workers trained per quarter over one year.

Infrastructure Strengthening for Commodities Management

Working both at the local and national level, Blueprint activities grew the capacity for commodities management by providing supervision, tools for data collection for inventory monitoring, and commodities management, including relevant data collection and inventory management. According to local sources, pharmaceutical supplies for hypertension and diabetes
were unavailable to communities in Meru prior to 2019. Frequent stock-outs and a lack of capacity to distribute medicines and supplies throughout health facilities prevented patients from accessing these services. Through commodities management strengthening efforts, the stock-out of NCD medicines decreased by 35%, from 51% time out-of-stock in early 2021 to 33% time out-of-stock at the end of the project in mid-2022. These new commodities management mechanisms help to alleviate stock-outs locally even if there are stock-outs at the national level at the Kenya Medical Supplies Authority (KEMSA), the national procurement agency for health commodities.

Tools like bin cards, which record the movement of supply in and out of medical stores and are kept with the physical stock, assist with managing the inventory of health products. New and strengthened inventory and accountability mechanisms, like increased supply and appropriate use of bin cards, improved accountability of NCD medicines by 63%, increasing from 44% of NCD medicines matching bin card records in early 2021 to 71.9% at the end of the project. At the national level, a tracer tool was developed and implemented in three pilot counties, including Meru, to track NCD medicines across Kenya. Lessons from the pilot integration of NCD medicines into the national health products and technologies reporting tool will be rolled out to health facilities nationally. Partners also engaged the Kenyan Ministry of Health to increase access to morphine and allocate funding towards the purchase and transport of morphine powder to Meru health facilities, to improve the stock-out of oral morphine solution during the COVID-19 pandemic.

**Growing NCD Commodity Supply**

Partners purchased and distributed glucometers, 1,000 automated blood pressure machines, 300 smartphones (supplementing the 1,000 smartphones previously distributed by the county), and batteries for medical devices and technology used in healthcare facilities in Meru for screening activities. This increase in HPTs available across Meru County supported the efforts of newly trained health workers to screen, diagnose, and refer Meru citizens to further care for NCDs.

Additionally, partners supported the quarterly order rationalization efforts by the county coordination team to ensure that all orders that were submitted to KEMSA reflected the needs on the ground and aligned with the budget. These rationalization exercises ensured that the right products in the right quantities were ordered by the health facilities.

### NCD Prevention, Screening, Treatment, and After Care

**Objective**

5. **INCREASE COMMUNITY AWARENESS FOR NCDs**

The community lacked awareness of NCDs in Meru County prior to the implementation of the Blueprint program. Barriers to knowledge on NCDs included lack of financial incentives to complete trainings or attend awareness events, distance from CHVs and local health facilities, and poor community understanding of NCDs and their risk factors and symptoms.

Through door-to-door outreach, community advocacy meetings, and mass screening events, the Blueprint Consortium generated community awareness of NCDs. A mid-term program evaluation survey, conducted by one of the Blueprint partners, assessed the effect of CHV capacity-building efforts on the awareness of NCDs and preventative and health-seeking behaviors among Meru community members. Of the 384 households visited and interviewed, the survey found that 94% of community members understood the importance of early NCD screening as a result of CHV outreach and advocacy under Blueprint. Additionally, 80% of community survey participants reported that they understood the lifestyle modifications needed to prevent...
A large proportion of survey participants acknowledged that those who suffer with alcohol and drug addiction are more likely to live sedentary lifestyles that put them at risk of developing one or more NCDs. With this understanding of NCDs and their causes, 86% of community survey participants reported carrying out preventive health behavior. As a result of CHV-led education efforts, respondents were able to identify preventive measures and health seeking behaviors successfully.

The formation of 22 NCD support groups, mobilizing 1,448 people living with NCDs, provided both psychosocial support and a platform for those living with NCDs, to increase their advocacy and mobilize community members to address NCD concerns. These support groups trained those living with NCDs on advocacy, budgeting, financing, and policy development. Participation in these support groups also helped diabetes and hypertension patients improve information-sharing on drug adherence, adapt healthy nutritional practices, and better their livelihoods.

Increased awareness of NCDs in Meru will help to support the continuation of services implemented during the Blueprint program. Partners also created awareness and advocacy for palliative care in Meru through 32 advocacy meetings, educating community members on the importance of palliative care in NCD management and care.

**Screening, Referrals, Treatment, and After Care**

Blueprint-trained CHVs conducted 156,965 individual screenings for hypertension and diabetes. Of these, 9,731 people were referred to facilities for further diagnosis or treatment. Prior to Blueprint, there was no routine or community screening for hypertension and diabetes in Meru County. Screening for hypertension would occur for in-patients, but there was no system for hypertension or diabetes screening outside of the hospital due to a lack of trained CHVs.

On average per quarter, 26% of the individuals who were screened for hypertension were referred to facilities for further diagnosis or treatment. The Blueprint partners did not track individual patients following referral and therefore the actual clinical diagnoses and treatment rates are unknown. Trained CHVs reported that more people who have been screened for hypertension and diabetes are seeking medical attention for treatment. According to the mid-term survey, those who were found to have out-of-range blood sugar and blood pressure were the most likely to seek additional care.

Before Blueprint’s initiation in 2019, according to local sources, palliative care services in Meru County were not funded and these services were uncommon across the county’s health facilities. Prior to the Blueprint, palliative care was only offered at Maua Methodist Hospital, Meru Hospice, and the Meru Teaching and Referral Hospital; by March 2022 patients with palliative care needs were also seen at Kanyakine, Cottolengo, St. Theresa, Nyambene, and Muthara hospitals.

Increased awareness of palliative care during Blueprint’s duration likely drove greater uptake of palliative care services, with a 319% increase in palliative care visits from 2019 to 2022. This greater use of palliative care services likely increased oral morphine consumption in Meru by 292%, between the first quarter of the Blueprint in 2019 through the last quarter. In total, 15,563 total patients received palliative care during Blueprint. According to hospice officials in the county, the enhanced capacity of health providers in Meru County to provide palliative care has increased referrals and changed how people view palliative care. Beginning in 2019, patients were referred to palliative care at an advanced stage in disease progression for end-of-life care. Services offered pain and symptom management, and morphine began to be offered to patients. Psychosocial, spiritual, and end-of-life care, as well as bereavement support, helped increase diagnosis acceptance among both patients and healthcare providers. Previously, hospice officials in the county noted a hesitance among healthcare providers, to tell their patients about a terminal diagnosis.
**GOAL:** To strengthen the capacity of Meru County’s health system to address NCDs

**FOCUS AREA:** Health Infrastructure and Delivery Capacity for NCDs

**ACTIVITIES**

- **Health System Delivery Capacity**
  - IMPACT: 890 individuals with strengthened knowledge and skills for preventing, detecting, and treating diabetes, hypertension, cancer, and providing palliative care (1,258 unique individuals trained and assessed)

- **Commodities and Supply Chain Management**
  - IMPACT: • 200 individuals trained on effective commodities management
  - • Decreased the stockout of NCD medicines by 35%
  - • Developed and disseminated 20,000 job aids on commodities management
  - • Developed and implemented reporting systems for national rollout of NCD products
  - • Purchased glucometers, 1,000 automated BP machines, and 300 smartphones

- **Policy and Financing**
  - IMPACT: 523 people living with NCDs trained in county budget process

- **Disease Surveillance and Data Collection**
  - IMPACT: • Established the first population-based and five hospital-based cancer registries in Meru County
  - • 5,721 verified cancer cases uploaded to Meru population cancer registry

**FOCUS AREA:** NCD Prevention, Screening, Treatment, and After Care

**ACTIVITIES**

- **Community Awareness**
  - IMPACT: 365,470 community members received educational materials on NCDs

- **Access to Health Services and Earlier Detection of NCDs**
  - IMPACT: • 156,965 people screened for hypertension and diabetes, with 9,731 referrals
  - • 319% increase in uptake of palliative care services from 2019 to 2022 in Meru
VII. LIMITATIONS & CHALLENGES

Several limitations and challenges have impacted the results of the Blueprint, including the original program design, data analysis, and external factors beyond the control of the implementing partners. Each limitation or challenge is described below.

**Program Design**

The Blueprint scope of work evolved during the three-year initiative and at times lacked clarity. Initial indicators developed by partners were reflective of a broader set of ambitious objectives that overlapped with, and in some cases were influenced by, work streams funded by other entities. Disaggregating the Blueprint specific activities, given programs and partners’ funding of similar activities in Meru, created hurdles with respect to indicator development, including feasibility and establishing relevant metrics. Timing of the onboarding of the evaluation advisor nine months after start-up also resulted in delayed development, or in some cases refinement, of partner expected outputs/outcomes and monitoring indicators. The delay in establishing the data collection and monitoring system caused several pivots and changes in the data collection process, in some cases affecting the quality of the data and producing data gaps.

**Data**

A variety of challenges affected data collection, analysis, and ultimately the evaluation of results of the Blueprint program. In the data collection phase, limitations in data access influenced how screening, referral and treatment data was reported for hypertension, diabetes, and palliative care. Disease screening data for diabetes and hypertension data reported together as screening activities tended to capture both of these diseases, and in some cases partners reported them as one value. The Blueprint partners did not track individual patients following post-screening referrals and therefore the actual clinical diagnoses and treatment rates are unknown. A unique count of individuals accessing palliative care was unavailable, thus data reporting focused on number of encounters for palliative care. Baseline data was also collected retrospectively at the end of the program which likely introduced recall bias into the results. Baseline data was also only acquired through qualitative interviews with key local health leadership and did not include quantitative information on which to make comparisons to current state. Data fluctuations during program monitoring also occurred due to the evolution of the understanding of the Meru context and partner activities.

With regard to data analysis, differences among partner activities and data reporting are reflected in how the data is aggregated and reported for the collective indicators. For example, when aggregating training data, additional effort was taken to ensure that a unique count of individuals was being represented for the collective results, in addition to counts of people trained per topic, as many partners held multiple trainings on different topics with the same cohort. Of the seven partners who were engaged with the Blueprint since 2019, only six partners contributed data to the collective impact indicator analysis. The loss of engagement of one of the partners, primarily focused on cancer diagnosis and treatment interventions, impacted the measurement and reporting on this topic.

Finally, with regard to evaluation, given the timespan of the program, very few outcomes are reported; the results focus mostly on the outputs of activities or short-term outcomes, as medium- or long-term outcomes were not attainable in three years. Partners also joined the Blueprint at various times, thus limiting the amount of data available for analysis and the inability to achieve outcomes in a short timeframe.
A number of factors outside the control of the Blueprint contributed to several key challenges. KEMSA, the national medical products supplier, underwent significant management changes which impacted their responsiveness and product order turn-around times, leaving many counties to run out of stock and impacting Meru commodity management activities. Resourcing constraints such as lack of batteries for equipment or inconsistent access to consumables prevented or decreased the amount of screening activities. Nursing strikes impacted the entirety of the health system, creating additional burden on a system already strained by COVID-19.

COVID-19, beyond impacting health worker staffing, also impacted Blueprint Consortium activities. Policies preventing large gatherings for screening events and community fear of visiting health facilities required last minute adaptations and pivots from partners to accommodate these constraints. COVID-19 may also have influenced the uptake of palliative care services in the county.
IX. RECOMMENDATIONS FOR PROGRAM IMPLEMENTERS AND FUNDERS

This work has yielded a variety of learnings and insights for working with a consortium of partners. From these learnings we have identified four key recommendations for future program implementers and funders of these important activities.

1. **Set up evaluation plans at the beginning of the program, with considerations for sustainability and scalability incorporated.**

Allocate sufficient time in early program planning to set up an evaluation structure that clearly identifies programmatic goals and objectives across the consortium, and how progress and results will be measured. For example, if a program’s goals are to improve quality of life then indicators must be set up to measure quality of life to understand if a change has been made as a result of programmatic activities. Also, it is important that program activities or interventions are actually able to address the goals.

Evaluation plans also enable the identification of short-, medium-, and long-term outcomes, or changes that are the result of the program’s efforts. Specific activity outputs, like the number of people participating in a screening event, are also identified through these plans, in addition to overall targets for outputs and outcomes. When seeking to understand change over time, it is helpful to have initial, or baseline, data (collected at the outset) that enables a point of comparison at the end of a program. Finally, evaluation plans may also set expectations for the ability to collect data and the depth and quality of data collection possible – be as realistic as possible when planning and adapt as needed.

Sustainability and scalability elements should be considered, along with evaluation plans, to identify opportunities for program interventions to be maintained and supported beyond the funding period, or to identify opportunities for expanding programmatic components in greater quantities or to additional locations. This is particularly relevant given that many programs may initially produce primarily outputs or short-term outcomes during the duration of their funding (typically one to three years), and long-term outcomes and impacts won’t be realized until much later or in future phases.

2. **Be flexible to adapt programmatic approaches as needed to account for external factors.**

The COVID pandemic, health worker strikes, supply chain disturbances, and other factors beyond the control of implementing partners, forced the partners to adapt their activities and approaches to their work. Planned program activities may not be feasible at the point in time originally planned. Allowing for adaptability and flexibility to pivot as needed is important for both program funders to recognize and for implementers to communicate with local partners and involved communities.
Communicate progress and results effectively and frequently.

While seemingly intuitive, data capture and evaluation can be complex. Collecting the right data, and being able to interpret and communicate about it in an effective manner enables a better understanding of the work and the impact of a program. Frequent tracking of progress and sharing of results also provides opportunities to identify gaps, best practices, and make course corrections. Consider your audience and ensure that data is shared according to their preferences and expectations. It is also important to accommodate for or acknowledge data challenges and limitations, such as poor or inadequate data systems, lack of personnel to collect data, or inconsistencies in reporting. External factors, like the COVID pandemic, also affect activities and results and should be described.

Establish strong leadership at the consortium level to facilitate a unified approach for reaching program objectives

While each partner may maintain their own activities, the collective has to come together to align on objectives and intended impact, as well as the indicators to measure impact. A consortium combines the efforts of multiple partners, and strong leadership can help to ensure that partner activities and their objectives for impact are unified and fully supported across the entire consortium. This also facilitates an environment for recognizing potential overlap in activities and therefore being able to improve coordination or make pivots to enhance the potential for change. Strong leadership is also needed to set up programmatic governance, rapidly make decisions, solve problems, and negotiate solutions.
A benefit of working as a consortium is the ability to leverage collective work and expertise to generate results, buy-in, and motivation for lasting change. Educating the health workforce through a variety of trainings strengthened community knowledge and skills to address NCDs and implement related health system activities. Systems strengthening activities, including data infrastructure and reporting, advocacy, research, and tools and practices for commodities management, built the foundation for NCD management and can be enhanced over time. As a result of discussions with the partners, the following five themes were identified as areas of Blueprint impact that may be sustained over time. Sample indicators for measuring the sustainability of these efforts are included in Appendix 5.

A large portion of the Blueprint work was in support of strengthening the knowledge-base of healthcare workers involved in NCD care and supporting systems, from community volunteers through hospital providers. Educating the full range of health workers, across all cadre involved in NCD prevention and care, should have lasting effects on Meru’s health system and in communities across the county, particularly for those individuals who are retained in the health system.

- Training at different levels of the health system has expanded NCD services beyond level 4 and level 5 facilities to include lower level facilities thus expanding care access for the Meru population.
- Ongoing and refresher trainings, as many partners have committed to doing, will help ensure continued availability of and awareness for NCD services.
- Ongoing supervision and mentorship of trainees helps create a continuous and active learning environment to ensure knowledge gain and skill sets are maintained.
- Blueprint-developed cancer training curricula approved for national use will ensure that the future workforce will be educated on the topic.
- Training different cadres of health workers expands the pool of human resources that are knowledgeable about NCDs.

Working closely with Meru County government and local public health system leaders, the Blueprint has generated significant momentum and buy-in to continue support for NCD prevention and control mechanisms in Meru. Individuals and health system leaders are empowered and engaged to continue to advance NCD activities and awareness.

- Health facility committees are empowered to move their NCD-focused agendas forward.
- Master trainers (or trainer-of-trainers) are capacitated to provide ongoing training and mentorship support to health workers and providers.
- Newly-remunerated CHVs, also recently designated as an official cadre of the health system, are more likely to be retained to continue their community engagement and education efforts.
- Continued engagement with local and national health leadership, leveraging their expertise, work, and advocacy for NCDs, will continue to elevate and highlight the importance of this growing burden. This is particularly important in the wake of recent elections and possible staff turnover among local health leadership.
Engaging with national entities like the Ministry of Health or other institutions and regional entities like the Africa Cancer Registry Network create strong support and leadership for consistency, buy-in and validation of the Blueprint work locally, nationally and regionally.

- Advocacy for, and contribution to the development of key policy and guidance documents such as the National Palliative Care Policy launched in October 2021, or the NCD annual workplan in Meru County, serve as roadmaps for current and future NCD efforts.
- Engagement with national technical working groups creates strategies and guidelines that impact county goals and activities; engagement with the MOH provides opportunities for support to the county.
- Aligning with the National Cancer Institute and possible membership in the Africa Cancer Registry Network can bring additional benefits and opportunities to Meru, including training, mentorship, and exchange programs.

Throughout the Blueprint program, NCD-systems building and strengthening has been at the crux of the objectives of the consortium. New opportunities now exist to build on these foundations for greater impact.

- By focusing on creating systems to manage all health commodities, not just those for NCDs, teams are better equipped to manage the entire system as opposed to one part.
- Strengthening systems that enable reporting on high-quality data helps teams to see the value of these systems and encourages continued use of these systems for reporting and feedback loops.
- Shifting from paper-based data records to digital records enables more efficient and up-to-date reporting that supports regular evidence-based decision making, research, and advocacy.

Programs are typically sustained with continued funding for activities. This is also true of Blueprint, though new funding from other sources is deepening the impact of partner efforts.

- New funding is training blind and deaf CHVs using the same cancer curriculum developed under Blueprint.
- Meru NCD support groups are generating their own funding to continue their activities.
XI. IMPACT SUMMARY

As the original Blueprint activities come to a close, the results highlight the success of a collective approach to building a foundation that will address the growing health burden of non-communicable diseases. Training health providers, both clinically licensed professionals and community health volunteers, has increased the capacity for preventive and responsive NCD care. Commodities management capacity strengthening provided additional support to care providers and patients, ensuring improved access to and confidence in medicines and supplies. Advocacy efforts to ensure ongoing support for NCDs, via funding or policies or both, were influenced by the availability of timely, quality data, which was made possible by the concerted efforts of the Blueprint to set up and support the collection, cleaning, and regular reporting of NCD data.

While all activities concentrated on Meru, materials and approaches emanated from national guidelines and procedures to provide consistency and scalability. Use of approved MoH curricula, and national-level advocacy for NCD policy and funding, set the stage for continued expansion of efforts within Meru County, but also potentially for other counties and nationally. The success of the Blueprint laid the groundwork for future programming to continue to alleviate the NCD burden in Meru, Kenya, and beyond.

“
It was a true Blueprint.
Appendix 1. Health Facility by Type

In Meru, dispensaries and outpatient clinics are the most predominant facilities in the county, followed by community health worker facilities at the community level, health centers, and then district/primary hospitals.

Table 1. Operational Public, Private and NGO Health Facilities Hierarchy in Meru County

<table>
<thead>
<tr>
<th>Level</th>
<th>Health Facilities</th>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1: Community</strong></td>
<td>Community health workers (CHWs) and community health volunteers (CHVs) work at the local level at community health facilities and visit households to treat minor ailments and conduct screening, testing, and contact tracing to refer patients to other facilities for further care.</td>
<td></td>
<td>140</td>
</tr>
<tr>
<td><strong>Level 2: Dispensaries and Clinics</strong></td>
<td>Registered nurses and trained health workers provide outpatient services at the local and community level, including pharmacy, laboratory, prenatal and postnatal, and curative treatment services. Dispensaries and clinics do not have in-patient facilities.</td>
<td></td>
<td>465</td>
</tr>
<tr>
<td><strong>Level 3: Health Center</strong></td>
<td>Health centers are small-scale hospitals with fewer facilities than county and national hospitals, and have at least one doctor or clinical officer that serves as the in-charge and provides comprehensive primary care. Registered nurses and clinical officers provide care and services such as maternity in-patient services, diabetes &amp; hypertension clinics, and comprehensive care clinics.</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td><strong>Level 4: District/Primary Hospital</strong></td>
<td>District and primary hospitals offer similar services as a health center, but on a larger scale. Facilities may have a surgery unit or a medical officer that is trained on a wider range of medical and surgical services.</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td><strong>Level 5: County/Secondary Hospitals</strong></td>
<td>Each of Kenya’s 47 counties has a county hospital that is the referral point for the district hospitals. These are regional centers that provide specialized care, including intensive care units and life support. County hospitals have over 100 beds for in-patient capacity and conduct research. In Meru, this is the public Meru Teaching and Referral Hospital (MeTRH).</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Level 6: National Referral/Tertiary Hospitals</strong></td>
<td>Three national referral hospitals in Kenya offer the same services as Level 5 facilities, but offer more specialized treatments to patients and serve the greater East Africa and Central Africa</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Total (excluding Level 1) number of operational health facilities in Meru County | 543 |
## Appendix 2. Evaluation plan template

<table>
<thead>
<tr>
<th>IMPACT GOAL:</th>
<th>PLANNED ACTIVITIES</th>
<th>PROCESSES: Activities or interventions conducted to achieve</th>
<th>INTENDED RESULTS</th>
<th>OUTCOMES: Desired results, changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STRUCTURES: Resources to accomplish activities</td>
<td>ACTIVITIES</td>
<td>OUTPUTS</td>
<td>Short-term outcomes: At the end of program you expect changes in this skills, awareness, knowledge, attitudes, motivations, behaviors</td>
</tr>
<tr>
<td></td>
<td>List the resources you need to carry out your activities</td>
<td>List activities that will help you achieve your goal</td>
<td>Describe how you intend for your activities to perform (participants reached, products created, activities conducted)</td>
<td>Describe the immediate changes you expect to achieve as a result of the activities</td>
</tr>
<tr>
<td>SMART INDICATORS</td>
<td>List indicators</td>
<td>List indicators</td>
<td>List indicators</td>
<td>List indicators</td>
</tr>
<tr>
<td>ASSUMPTIONS + EXTERNAL FACTORS</td>
<td>List any assumptions and external factors</td>
<td>List any assumptions and external factors</td>
<td>List any assumptions and external factors</td>
<td>List any assumptions and external factors</td>
</tr>
</tbody>
</table>
Appendix 3. Summary of collective indicators

*In some cases, data limitations meant we were only able to record a numerator or denominator*

**HEALTH INFRASTRUCTURE AND DELIVERY CAPACITY FOR NCDs**

- Number of cancer registries setup
- Total number of cancer cases uploaded to the cancer registry
- Total number of cancer cases reviewed for eligibility for abstraction and upload to cancer registry
- County budget allocated to NCDs in healthcare budget
- County budget allocated to healthcare
- County budget allocated to palliative care in healthcare budget
- Number of community members, including people living with NCDs, trained on county budgeting making process
- Number of community members, including people living with NCDs, who participate in target county budgeting processes
- Number of staff trained on commodity management for NCD health products and technologies
- Percent of healthcare workers passing post-training assessments of their knowledge on hypertension, diabetes, cancer or palliative care
  \[
  \frac{\text{Number of health care workers passing}}{\text{Number of health care workers trained}}
  \]
- Percent of healthcare workers passing cancer registry courses
  \[
  \frac{\text{Number of health care workers passing}}{\text{Number of health care workers trained}}
  \]

**NCD PREVENTION, SCREENING, TREATMENT, AND AFTER CARE**

- Number of individuals screened for hypertension, diabetes or cancer
- Percent of individuals referred to a facility for diagnosis after screening
  \[
  \frac{\text{number of individuals referred to a facility after screening}}{\text{number of individuals screened}}
  \]
- Percent of individuals diagnosed after referral to facility
  \[
  \frac{\text{number of individuals diagnosed after referral}}{\text{number of individuals referred to care after screening}}
  \]
- Number of clients with palliative care needs referred to palliative care by community health volunteer
- Number of persons living with palliative care needs who used palliative care services for the first time during the past quarter
- Number of people in Meru County accessing palliative care services per quarter
## Appendix 4. Blueprint quarterly data reporting schedule

<table>
<thead>
<tr>
<th>PROGRAM QUARTER</th>
<th>CALENDAR REPORTING PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>April 1 - June 30</td>
</tr>
<tr>
<td>2</td>
<td>July 1 - September 30</td>
</tr>
<tr>
<td>3</td>
<td>October 1 - December 31</td>
</tr>
<tr>
<td>4</td>
<td>January 1 – March 31</td>
</tr>
</tbody>
</table>
Appendix 5. Illustrative Sustainability Indicators

The illustrative indicators described below are dependent on the activities available in Meru to various cadres of health professionals and community members. The ability to track the data is also dependent on the data source and if the information is available. County health leaders must develop an evaluation plan that assesses the feasibility of data collection and evaluation.

**Sustainability Topic 1. Educated Workforce for NCDs**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Suggested Frequency of Data Collection</th>
<th>Data Collection Method</th>
<th>Possible Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td># topic-specific refresher trainings</td>
<td>Every 6 months</td>
<td>Training data</td>
<td>Training program</td>
</tr>
<tr>
<td># unique participants in each refresher training</td>
<td>Every 6 months</td>
<td>Training data</td>
<td>Training program</td>
</tr>
<tr>
<td>Refresher training passrate (# passed assessment / # trained in topic)</td>
<td>Every 6 months</td>
<td>Training data</td>
<td>Training program</td>
</tr>
<tr>
<td>Skills assessment passrate (# passed assessment / # trained in skills)</td>
<td>Every 6 months</td>
<td>Training data</td>
<td>Training program</td>
</tr>
<tr>
<td># education programs using national curricula, inclusive of Blueprint-developed cancer training modules</td>
<td>Annual</td>
<td>Survey</td>
<td>Ministry of Health / Education</td>
</tr>
<tr>
<td># health workers knowledgeable about NCDs (disaggregated by cadre)</td>
<td>Annual</td>
<td>Survey</td>
<td>County NCD Coordinator</td>
</tr>
<tr>
<td>% referred for suspected NCDs (disaggregated by specific NCD) (# referred / # screened)</td>
<td>Every 6 months</td>
<td>Program data</td>
<td>Program partner, County NCD Coordinator</td>
</tr>
<tr>
<td>% NCDs diagnosed (# diagnosed / # referred)</td>
<td>Every 6 months</td>
<td>Program data</td>
<td>Program partner, County NCD Coordinator</td>
</tr>
<tr>
<td>% NCDs treated (# treated / # diagnosed)</td>
<td>Every 6 months</td>
<td>Health records</td>
<td>Program partner, County NCD Coordinator, county health records administrators</td>
</tr>
<tr>
<td>% community NCD awareness (# reporting awareness of NCDs / # surveyed for awareness of NCDs)</td>
<td>Every 6 months</td>
<td>Survey</td>
<td>County CHV Leader</td>
</tr>
</tbody>
</table>

**Sustainability Topic 2: Local NCD Champions**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Suggested Frequency of Data Collection</th>
<th>Data Collection Method</th>
<th>Possible Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>% NCD-trained and remunerated CHVs retained in health system</td>
<td>Annual</td>
<td>Human resource records</td>
<td>County CHV Leader</td>
</tr>
<tr>
<td>(# NCD-trained and remunerated CHVs continuing to work in Meru at year-end / # NCD-trained and remunerated CHVs working in Meru at the beginning of the year)</td>
<td>Annual</td>
<td>NCD work plan progress tracker</td>
<td>County NCD Coordinator</td>
</tr>
<tr>
<td>% NCD goals completed in annual NCD work plan</td>
<td>Annual</td>
<td>NCD work plan progress tracker</td>
<td>County NCD Coordinator</td>
</tr>
<tr>
<td># meetings held with local and national leadership on NCD-specific topics</td>
<td>Every 6 months</td>
<td>NCD work plan progress tracker</td>
<td>County NCD Coordinator</td>
</tr>
</tbody>
</table>
### Sustainability Topic 3: Coordination and Alignment with National and Regional Entities

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Suggested Frequency of Data Collection</th>
<th>Data Collection Method</th>
<th>Possible Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>% NCD goals completed in annual NCD work plan</td>
<td>Annual</td>
<td>NCD work plan progress tracker</td>
<td>County NCD Coordinator</td>
</tr>
<tr>
<td># Meru public / private entities engaged in national NCD policy or technical efforts</td>
<td>Annual</td>
<td>Survey</td>
<td>County NCD Coordinator</td>
</tr>
<tr>
<td># NCD-focused programs and trainings occurring in Meru</td>
<td>Every 6 months</td>
<td>Survey</td>
<td>County NCD Coordinator</td>
</tr>
</tbody>
</table>

### Sustainability Topic 4: Foundational Systems and Structures for NCD Management

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Suggested Frequency of Data Collection</th>
<th>Data Collection Method</th>
<th>Possible Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td># verified / accurate cases uploaded to population cancer registry</td>
<td>Every 6 months</td>
<td>Cancer registry</td>
<td>County health records staff</td>
</tr>
<tr>
<td>% NCD commodities stocked out (# NCD commodities available at the end of the month / # NCD commodities available at beginning of month)</td>
<td>Every month</td>
<td>Pharmacy records</td>
<td>Facility pharmacist; County health department</td>
</tr>
<tr>
<td>% patients retained on NCD treatment (# patients continuing with treatment at end of time period / # patients started on treatment at beginning of time period)</td>
<td>Every quarter</td>
<td>CHV records</td>
<td>County CHV leader</td>
</tr>
</tbody>
</table>

### Sustainability Topic 5: Leverage Results for New Funding and Deeper Impact

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Suggested Frequency of Data Collection</th>
<th>Data Collection Method</th>
<th>Possible Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>% change in county NCD budget from previous year</td>
<td>Annual</td>
<td>County budget</td>
<td>County financial records</td>
</tr>
<tr>
<td># new programs focused on NCDs extending from original Blueprint program</td>
<td>Annual</td>
<td>Program data</td>
<td>County NCD coordinator</td>
</tr>
<tr>
<td># NCD support groups</td>
<td>Annual</td>
<td>Survey</td>
<td>County NCD Coordinator</td>
</tr>
</tbody>
</table>
REFERENCES

3. ibid.
10. ibid.
14. ibid.
16. World Health Organization (n.d.)
18. ibid.
20. The County Government of Meru Department of Health, pgs. 8-10.
24. ibid.
29. ibid.
30. ibid.