COMMUNITY LIFE CENTRES AS PRIMARY CARE MODEL IN KENYA

EVALUATION IN KIAMBU AND MANDERA COUNTIES

KIT Royal Tropical Institute

Philips Foundation

KIT Royal Tropical Institute

COUNTRY REPORT KENYA FINAL MAY 2021

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ABBREVIATIONS

ANC	Antenatal care
ART	Antiretroviral therapy
BCG	Bacillus Calmette-Guérin
CCC	Comprehensive Care Clinic
CHC	Community Health Committees
CHV	Community Health Volunteer
CHEW	Community Health Extension Worker
CLC	Community Life Center
CSO	Civil Society Organization
CWC	Child Welfare Clinic
DAC	Development Assistance Committee
DTP	Diphtheria Tetanus Polio
DHS	Demographic Health Survey
DHIS2	District Health Information System 2
EMR	Electronic Medical Record
EPI	Expanded Programme on Immunization
FGD	Focus Group Discussion
GEP	Good Epidemiological Practice
IDI	In depth interview
KII	Key informant interview
FBO	Faith Based Organization
FGD	Focus Group Discussion
FP	Family Planning
KIT	KIT Royal Tropical Institute
KII	Key Informant Interview
LMIC	Low- and middle-income country
M&E	Monitoring and evaluation
MoH	Ministry of Health
NHIF	National Hospital Insurance Fund
NHIS	National Health Insurance Scheme
NGO	Non-Governmental Organization
OEDC	Organization for Economic Co-Operation and Development
OPD	Outpatient department
QA	Quality Assurance
SBA	Skilled Birth Attendant
SCI	Service Coverage Index
TB	Tuberculosis
ToC	Theory of Change
UHC	Universal Health Coverage
UNFPA	United Nations Population Fund

EXECUTIVE SUMMARY

BACKGROUND

Since 2014, Philips has been deploying Community Life Centres (CLCs) in Kenya. These CLCs are examples of a primary care approach aiming to contribute to Universal Health Coverage (UHC) by increasing quality of care and effective coverage of services, strengthening management and support functions, and promoting community engagement. KIT Royal Tropical Institute was asked by Philips Foundation to conduct an independent mixed-method evaluation (2019-2020) to generate evidence regarding the effects of CLCs on access, utilization, and quality of primary care services in Kenya and South Africa. The two evaluated CLCs in Kenya are situated in Kiambu and Mandera county and both remain part of the publicly owned and financed health system. The evaluated CLC in South Africa is part of the private not-for-profit sector. The overall key findings and lessons learned of these evaluations aim to contribute to the effective delivery and scale up of CLCs taking into account contextual differences and requirements. This Kenya country report presents the main findings of the independent evaluation of the two CLCs in Kenya. The main findings from the South Africa evaluation will be presented in a separate report. A final synthesis report will also include a discussion on the opportunities of this primary care delivery model, and a revised Theory of Change.

STUDY OBJECTIVES

1. To assess the relevance of the services offered through the CLCs.
2. To assess healthcare seeking behaviours (barriers, preferences, and responsiveness to needs) within the catchment population of selected CLCs.
3. To assess trends in healthcare utilisation using selected tracer conditions in the CLCs emphasizing reproductive, maternal, neonatal and child health services, and including both services provided at the facility as well as outreach activities initiated from the facility.
4. To evaluate perceived and realized quality of healthcare provided to the population in the CLCs.
5. To assess the appropriateness of support and management functions of the CLCs.
6. To explore the overall outcomes of the CLCs and draw lessons about the contribution of the CLCs to the elements listed in objectives 1-5.

The discussion around the CLCs as an innovative model of primary care delivery and a reflection to make even better use of its potential benefits is opportune and strategic. In the last few years, several reports have been published on the challenges around quality of care in low- and middle-income countries. In all these discussion and global policy forums, the importance of primary health care has been reconfirmed and primary health care has been called the centrepiece for the achievement of the Sustainable Development Goals and Universal Health Coverage. The CLCs deployed by Philips are a commendable and promising initiative deserving attention within the public/private arrangements. The evaluation of two CLCs in Kenya has generated insights on the challenges and which opportunities deserve more attention. We also identified room for stronger CLC profiling.

MIXED-METHOD APPROACH

We conducted a mixed-method study in which qualitative and quantitative methods were combined during the design, data collection and analyses. In both study areas, a control facility was selected to explore the plausibility of a causative link between the CLC-specific interventions and outcomes measured. To get insights about awareness of, preferences for, and barriers to seeking primary care offered at the CLCs, 57 in-depth interviews (IDIs) with (young) women of reproductive age and (young) men were conducted. To explore the views on the relevance of the CLCs and the service offered, the quality of care, the management of the CLCs and community participation, 51 key informant interviews (KIIs) were held with identified key stakeholders. To explore health care seeking behaviours regarding primary care in the catchment population of the CLCs, 12 focus group discussions (FGDs) were conducted. We interviewed a total of 516 clients (in the CLCs and the control facilities) directly after their consultation (client exit interviews) to assess the experience in receiving care relating to professionalism, comfort, respect, and perceived quality of care. Furthermore, consultation observations were conducted to allow for better assessment of the process dimension of quality: whether the care delivery during consultation was matching the standards set nationally or internationally with regard to evidence-based practice as well as the relational aspects of the interactions. To provide additional context to care delivery in each facility, we collected information on the structural components of realized quality of care including the types of materials and supplies available, the quality of the infrastructure as well as the presence of official guidelines and their utilisation by staff. To assess health care seeking behaviour in the 3-6 km around CLC-Githurai a household survey was conducted among 432 households reaching 1,246 individuals. To contextualize the functioning and performance of the CLCs and their controls within the Kenya health system and policies, a desk review was conducted.

SCOPE, KEY FINDINGS, AND RECOMMENDATIONS

This report primarily concerns the findings and the recommendations based on the evaluation of two CLCs in Kenya. We therefore do not yet present a roadmap containing priority issues and our views on the CLC of the future. This will be the focus of a separate deliverable – the synthesis report – once the South Africa part of the study has been concluded. The key findings and recommendations based on the evaluation of two CLCs in Kenya are summarized below and organized following the specific evaluation objectives as outlined above.

Key findings	Recommendations
Relevance of services provided through CLC (Objective 1)	
• The co-creation process constitutes an important element of the CLC concept, providing an opportunity for a baseline assessment (qualitative and quantitative) of the needs of the catchment population, as well as laying a foundation for collaboration with county authorities and other stakeholders, fundamental for the coherence and sustainability of the activities of the CLC. • While there were continued contacts with county health authorities and some important partners, there was much less question of a continuous dialogue with target communities on their perceptions and expectations from the CLC, and on their evolving health needs.	• This co-creation process is a strong participative element of the concept that should be built upon and extended to a more regular dialogue, not only with local authorities, but also with the catchment community and vulnerable subgroups within the community, in order to follow up on their perceptions, challenges and expectations. • While a (more continuous) participative dialogue is commendable, Philips should take care to define and preserve the core elements of the approach/concept of the CLC. • An explicit Memorandum of Understanding (MoU) should specify the initial and ongoing role of Philips and all other partners involved, in order to manage expectations.
• The CLCs in Kenya are generally well aligned with national priorities and policies and the local burden of disease. Particularly, the emphasis on primary care and maternal and child health problems respond well to the current local context. • Some health problems seem to receive less attention than what might be expected from the burden of disease: this is particularly true for mental health problems, eye problems, substance abuse, skin diseases, and partly for non-communicable diseases, besides particular problems of vulnerable groups like adolescents. This lesser attention is not specific for CLCs, but CLCs also do not differentiate themselves in this respect from the control facilities. • Issues where perceived needs of the population are not being satisfied most often related to problems or services that are not usually part of the service package or mandate of a primary care institution, or that depended on supply systems that were part of the responsibility of Ministry of Health (MoH)/county health authorities; mentioned issues included some forms of cancer screening, essential drug supply, posting of sufficient and appropriately qualified human resources, and availability of an ambulance.	• Addressing currently unmet (or insufficiently met) demands for certain services, like mental health problems, adolescent-friendly services may increase visibility and profile of the CLCs. CLCs could attempt to be more proactive and distinctive in this sense. • Proper MoU with health authorities about mutual responsibilities and commitments (e.g., in terms of resource allocation for staff or supplies in case of increased utilization rates), and regular dialogue with community representatives should assist in managing false expectations from CLCs that are profiled as ‘Philips (CLC) specific’.

- CHVs played an important role as an interface between community and primary care facilities, including the CLCs, through reaching out to remote and vulnerable groups, informing the community on health issues, and guiding people with health problems to the CLCs.
- In Githurai in particular, the number of CHVs was considered insufficient, and the backpacks that were supplied by Philips were insufficient for all the CHVs in the area and not all equipment remained functional over time.
- Despite initial training, a need and request for more trainings for CHVs was found in the CLCs but also in the control facilities. Refresher trainings of CHVs, which is part of the CLC model, was not available in the CLCs.
- Generally, the tools and equipment supplied in the backpacks did fit into the community service package as defined in the community health policy of Kenya (e.g., mid-upper-arm-circumference (MUAC), automated blood pressure measurement, ChARM, pulse rate, respiratory rate, ear temperature); some technologies appeared less appropriate for the CHV level (e.g., oxygen saturation, foetal doppler). It was not clear whether the content of the backpack supplied by Philips was complementary to other tools and items supplied by county health authorities to cover the entire community service packages that CHVs have as their mandate. Based on limited information on training materials available to the evaluation team it was not clear whether the initial training in relation to the backpacks was focusing on the innovative equipment, or that it was integrated in the comprehensive tasks for these community services packages. During report review (April 2021) we received additional information that initial training included training on the equipment and clinical training on the CHVs modules.
- If backpacks are continued to be seen as a distinguishing feature of the CLC, it is essential to compose the content primarily driven by tasks as defined in the community health service packages. Innovative tools and equipment need to be in line and complementary to other tools and supplies needed for these service packages. Providing backpacks contents and training specific for the tools and equipment supplied by Philips should be avoided in order not to distract CHVs from their full range of activities.
- Planning should include assessment of quantity needed, maintenance, follow-up training and monitoring of its use, substituting of consumption items and supplies. CHVs everywhere show certain attrition rates and anticipating sharing of backpacks by CHVs who work from home in remote areas may not be realistic. The result of these operational challenges is that an innovation, which is very good in design, is over time not giving the results and potential that could otherwise be expected.
- Supplies of innovative equipment can be very motivating for CHVs and can therefore play an important role in implementing the community service packages. However, an appropriate balance should be found between the perceived attractiveness of new equipment and tools (from perspective of county health authorities, CLC staff and/or CHVs) and the evidence for real benefits for the ultimate beneficiaries. Although goodwill and trust are important assets in relation to the CLC concept, appearances in terms of perceived quality should not confound the "true" impacts that essential components of the CLC have on effective coverage and health status of populations served. An example is the use of ultrasound at a primary care facility: people are usually delighted to see images of their baby, or to be able to know the sex of their baby, but at the same time we should not lose track of the precise indications and potential for reducing maternal and neonatal mortality and morbidity.

- Innovative equipment such as automated blood pressure measurement should not be used in isolation, but as part of an integrated approach to cardiovascular risk screening and assessment, following WHO guidelines, assessing various risk factors simultaneously (e.g., overweight, smoking, diabetes, hypertension, cholesterol, physical inactivity), with linkage to advice, treatment, and referral as appropriate. Something similar applies to the pulse oximetry, that needs to fit in an integrated management of childhood illness approach.
- Innovations introduced by Philips as pilot experience beyond national guidelines should be linked with appropriate (and independent) operational research to assess acceptability, feasibility, and effectiveness. This is strategic for marketing purposes and to strengthen the profiling of Philips primary care approach.

Key findings	Recommendations
Effectiveness: Access, Utilization trends and Quality of Care (Objectives 2,3,4)	
• In Kiambu, most people experiencing a health problem find their way to health care, and they have many options in terms of providers. Choices are made by weighing price, perceived quality, waiting time, and direct distance. • CLC-Githurai is very well known by people living within 3 km distance from the facility and they were trusted to offer good quality services; CHVs seem to contribute little here to improve linkage with the CLC and promote utilization. • The percentage of clients who considered their waiting times reasonable was lower in the CLCs compared to the control facility clients. At CLC-Dandu, fewer options existed for alternative providers, and only 12% of users considered waiting times not reasonable compared to 40% of CLC-Githurai users. This might be partly due to rural populations appreciating waiting time differently than urban populations. • Overall, clients were satisfied with the behaviour of health facility staff; they were considered to be friendly and respectful, and providers were	• Integrate quality of care in the health management plan of the CLC through improved health education and information to waiting clients and integrate structural feedback loops and satisfaction panels. • Part of the CLC-modules should be continuous training of staff on both technical and interpersonal skills. This component should be guaranteed by the collaborating partners and specifically included in the MoU.

also trusted. A few exceptions occurred in CLC-Githurai where rudeness of staff was reported.

- There were no clear differences between CLCs and control facilities in general satisfaction of users, across a variety of dimensions.
- In Kiambu, both at the CLC and control facility, more facility clients were part of a prepayment plan (health insurance scheme) (~ 45 - 50%) than in Mandera (~ 4 – 7%). It should be noted that in Kenya, primary care services are primarily funded through general taxes (covering around 42% of total health expenditures), and not through social health insurance (National Hospital Insurance Fund covering around 8% of total health expenditures, and more the hospital services part). At CLC-Dandu, users were more often charged for services than in the control facility, despite primary care services being officially free. Reasons for this could not be uncovered.
- Drug stock-outs were frequent in all facilities, and in these cases, patients are referred to pharmacies where they have to pay. In both evaluated CLCs, users were less satisfied with the availability of drugs compared to users of the control facility. This could be due to having higher expectations, or to a higher workload not being matched with a larger supply of medicines.
- Both CLCs scored better than their controls across structural elements including availability of water, electricity, and lighting. With respect to ultrasound equipment this was also the case for CLC-Githurai but in CLC-Dandu the ultrasound machine was not fully operational due to lack of staff capable of performing ultrasounds.
- Lack of complete facility-level data available in DHS2 for the health facilities around the CLCs prevents reaching a conclusion on whether the CLC approach had a particular effect on utilization beyond the level of other facilities in the county. Generally, an upward trend was observed in maternal, child and reproductive care indicators at the county and sub-county level indicating the CLCs are in sync with increasing service demand.

Key findings	Recommendations
Appropriateness of Support & Management functions of the CLC (Objective 5)	
• The set of clinical and coaching modules, aiming at improving clinical and management practices in the CLC concept, were not available to the evaluation team and could not be assessed. In CLC-Dandu, some training materials were shared on a training for CHVs and that focused on equipment of backpacks. Continuous training and supervision are the mandate of county health authorities and were not different in CLCs compared to control facilities. • The overall impression is that the "software" (skills training and in-service guidance and follow-up) could be strengthened in comparison to the "hardware" of the CLC concept (solar panels, water supply, lighting, ultrasound equipment, EMR, internet connectivity, etc.).	• The 'training and tracking' part of the CLC concept should be reviewed by Philips to assess the alignment with MoH procedures and systems, and if considered needed, to conduct appropriate follow-up and prominence in the implementation of the CLC concept.
• In relation to human resources management, supply systems, reporting and accountability procedures and system, and mechanisms for social accountability, CLCs in the Kenyan context conform to government policies and guidelines, and do not differentiate themselves from (public) control facilities.	• In order to benefit fully from the typical CLC inputs, Philips could consider paying more attention to the 'training and tracking' module, either through precise collaboration agreements and follow-up with other stakeholders and public authorities, or by obtaining more autonomy in these areas so that CLCs can profile themselves appropriately. This would enhance the operational sustainability of the CLC concept.

- Water supply systems, electricity and lighting, and waste disposal arrangements, together with infrastructure refurbishments, make a very positive contribution to the image and reputation of CLCs. Lighting also contributes to the security of the premises, thereby favouring access also in the evening and night.
- An Electronic Medical Record (EMR) was only present in CLC-Githurai, not in CLC-Dandu. The EMR in Githurai was not fully functional, due to non-familiarity with the system of the staff, stolen computers, and perceived workload.

- The potential of EMR in both reporting of services provided and in individual patient management and follow-up, particularly for chronic diseases, HIV, ANC, and EPI is currently underexploited. Introduction in an individual primary care institution is probably less efficient in terms of training and follow-up guidance in entire counties. A proper balance needs to be sought between initial investment in hardware and training, and longer-term follow-up, harmonization with DHIS-2 and patient management for chronic diseases (particularly NCDs, HIV, TB, but also preventive services like ANC and EPI). Appropriate operational research should also accompany the introduction of this hardware and identify operational bottle necks. Once the EMR is properly functioning, visually attractive outputs can be produced to inform facility and patient management decisions (as also highlighted by Webster & Hanson referring to “dashboard” formats).

Key findings	Recommendations
Overall Outcomes & Sustainability (Objective 6)	
• It is plausible that CLCs may have contributed to effective coverage of essential services (and possibly slightly more than control facilities), through increased utilization rates and to improved quality of care. The improved quality of care concerns mainly structural elements of quality. On the technical quality we could not make firm conclusions. • In a system with empanelment of primary care providers, community members have to register with a preferred primary care provider. Consequently, the catchment population for which a primary care facility is responsible is clear. Relative contributions of primary facilities to effective coverage of services in a county can then be precisely estimated and attributed. Such a system of empanelment would depend on evolving health policies in relation to primary care. • Responsiveness to needs and overall satisfaction of services at both CLCs was generally satisfactory across users as well as stakeholders.	• Facility-level utilization rates and the various dimensions of quality of care should be carefully monitored in order to adjust the allocation of drugs or staff to the facility in response to increased workload if the CLC attracts more users. This will prevent negative feedback loops on quality of care. As the CLCs in Kenya are publicly run facilities, such precautions may also need to be included in a MoU. • In order to profile the CLC (even) more, explicit attention could be given to currently insufficiently addressed health problems (e.g., mental health, adolescent health problems, eye care) and/or to neglected or stigmatized groups in the population.

- Financial protection (protection from high costs related to use of healthcare services, while at the same time suffering from loss of income due to illness in a context where most of the population is working in the informal sector) is an important goal for health systems. Primary care services in Kenya are in principle free, but in the absence of adequate drug supply, people may be referred to pharmacies where they pay, and often “informal” fees apply. Our study showed that this occurred more often in Dandu than in the control facility.
- CLCs are established in areas that are usually relatively poor: this is the case in the urban suburb of Kiambu, and in Mandera, the CLC also attracts people from across the border who otherwise don’t have access to services.
- Together with community representatives and county authorities, it could be considered promoting transparency on fees to be paid and discuss opportunities and mechanisms to reach out to neglected and poor population groups. CLCs could, for instance, actively distribute information on schemes like Linda Mama or HISP (as is being done already in Githurai), although the relative contribution of these schemes to the funding of primary care is unclear at this moment.

INTRODUCTION

Advances towards Universal Health Coverage (UHC) have been slow in most African countries. The underfunding of primary care systems has been identified as one of the challenges that sub-Saharan countries face to achieve UHC (1). The quality of care in primary care facilities is reported lower than in secondary care facilities, and primary care facilities often lack basic infrastructure, staff or commodities like essential drugs, water, or electricity. New technologies and models to deliver primary care are changing the way healthcare is offered, utilised, and managed, paving the way to UHC. Since 2014, Philips has been deploying Community Life Centres (CLCs) in Kenya. These CLCs are examples of primary care service models aiming to contribute to UHC by increasing quality of care and effective coverage of services, strengthening management and support functions, and promoting community engagement. At present there has not been a systematic evaluation on the effect of the CLC model on the delivery, quality, and access to primary care.

Philips Foundation commissioned KIT Royal Tropical Institute (KIT) to evaluate the effect of CLCs on access to and utilisation of primary care services in Kenya and South Africa. For this evaluation, a combination of quantitative and qualitative research methods was used. This report is based on the data collected in Kenya. Primary data collection consisted of a household survey in the catchment area of the Githurai-Lang'ata Clinic; facility-level client exit interviews; focus group discussions; in-depth interviews with (young) women and men of reproductive age, and with key stakeholders; client-provider consultation observations; and facility observations in Kiambu and Mandera counties. Secondary analysis of District Health Information System 2 (DHIS2) data was also done.

The evaluation proposal was developed by KIT and approved by the Research Ethics Committee of KIT (May 23, 2019), Amref Ethics and Scientific Review Committee (July 11, 2019) and Philips Internal Committee for Biomedical Experiments (August 30, 2019). Philips Research Africa reviewed and approved the protocol. A local research team was subcontracted to perform the primary data collection.

The various studies performed provided an abundance of information and, to the greatest extent possible, these findings have been triangulated. After the chapters on objectives (Page 17), purpose and methods of the study (Page 22), Chapters 4 (Page 32) through 8 describe the findings of the assessment aligned with the first five objectives. These chapters all begin with a box summarising the key findings, before then answering the main evaluation questions of a specific research objective in greater depth. Where feasible, the results of the assessment in Kiambu and Mandera are integrated while answering the predefined evaluation questions. In these boxes the reader is informed where and what we triangulated. Following these findings the ninth chapter (Page 65) includes the discussion, recommendations, and conclusions. This document also contains annexes and references.

OBJECTIVES, EVALUATION QUESTIONS, SCOPE

OBJECTIVES

The general objective of this study was to generate evidence regarding the effects of CLCs on access, utilization, and quality of primary care services in Kenya. Specific objectives were:

1. To assess the relevance of the services offered through the CLCs.
2. To assess healthcare seeking behaviours (barriers, preferences, and responsiveness to needs) within the catchment population of selected CLCs.
3. To assess trends in healthcare utilisation using selected tracer conditions in the CLCs emphasizing reproductive, maternal, neonatal and child health services, and including both services provided at the facility as well as outreach activities initiated from the facility.
4. To evaluate perceived and realized quality of healthcare provided to the population in the CLCs.
5. To assess the appropriateness of support and management functions of the CLCs.
6. To explore the overall outcomes of the CLCs and draw lessons about the contribution of the CLCs to the elements listed in the specific objectives 1-5.

The evaluation framework presented below summarises the key evaluation questions which guided this study, their linkage with the study objectives and the organization of main findings in each chapter. The evaluation questions are categorized following the generic Organization for Economic Co-Operation and Development (OEDC)/ Development Assistance Committee (DAC) evaluation criteria (2).

Table 1 Theoretical framework including research objectives, key evaluation questions and report chapters

RESEARCH OBJECTIVES	KEY EVALUATION QUESTIONS	REPORT CHAPTERS
Relevance		
1. To assess the relevance of the services offered through the CLCs.	To what extent are the objectives and approaches of the CLC intervention aligned with national policies and strategies, and to the national burden of disease? To what extent do the CLC outreach activities target specific vulnerable population groups (women of reproductive age, children and the poorest)? How does the CLC concept promote stakeholder engagement in the delivery of primary healthcare services?	'Findings: Relevance of the services offered' 'Findings: Relevance of the services offered' and 'Findings: Appropriateness of support and management functions'
Effectiveness		
2. To assess healthcare seeking behaviours (barriers, preferences, and responsiveness to needs) within the catchment population of selected CLCs.	To what extent is the population aware of the services provided at the CLC? To what extent are the services provided at the CLC acceptable to the populations served? Can people easily use the CLC in terms of geographical access, accommodation, and affordability? Do the CLCs have sufficient resources available to offer a normal, quality package of primary services?	'Findings: Healthcare seeking behaviour'
3. To assess trends in healthcare utilisation using selected tracer conditions in the CLCs emphasizing reproductive, maternal, neonatal and child health services, and including both services provided at the facility as well as outreach activities initiated from the facility.	Are essential services used by the population?	'Findings: Utilization trends'
4. To evaluate perceived and realized quality of healthcare provided to the population in the CLCs.	Is the quality of services appropriate?	'Findings: Quality of Care'

Efficiency		
5. To assess the appropriateness of support and management functions of the CLCs.	What are the costs of providing services and support functions?*	
	Is management of the CLC appropriately functioning? How is efficiency of management processes and procedures?	'Findings: Appropriateness of support and management functions'
Impact		
6. To explore the overall outcomes of the CLCs and draw lessons about the contribution of the CLCs to the elements listed in the specific objectives 1-5.	What is the impact of the CLC intervention on the effective coverage of healthcare? How satisfied are people with the services that the CLC provides? What is the impact of the CLC on the financial protection of the population against catastrophic costs? What is the 'value for money' for the CLC concept and approach?* What is the impact of CLC on community living conditions?	'Discussion and Conclusions'
Sustainability		
	To what extent is the concept and approach of the CLC sustainable (financially, organizationally, capacity wise)?	'Discussion and Conclusions'

*Not enough data to respond the question

SCOPE OF THE EVALUATION

In the international literature, as well as in relation to the Philips CLC model, two terms are often used interchangeably: primary care and primary healthcare. While primary healthcare mostly refers to a broader approach towards health policy and service delivery based on a set of core principles defined in the Alma Ata declaration—equity and social justice, health promotion in connection to inter-sectoral approaches, universality of access to services, and community participation—primary care is more seen as a subset of this broader concept, having the following five key characteristics:

1. Close to client, first point of contact with the health system, in between informal care given in families and communities, and hospital care
2. Offering a comprehensive and integrated package of services
3. Continuity of care across the life cycle of a person
4. Coordination point for care across different levels of care, including social services
5. Community participation.

In developed countries, the term primary care is used most, with a wide diversity of approaches, from offering mostly curative care by family doctors, to services that also cover population-based preventive interventions. In developing countries, the term primary health care is generally used, most often with the same orientation towards primary care as described above, but with more ambiguity, sometimes restricted to community-based healthcare, and in other settings more broadly including all services in the district, including the district hospital.

In this evaluation, our focus is on the CLCs offering primary care services, according to the five-key characteristics described above, and including their coordinating role with community-based workers and volunteers.

In the Philips brochure describing the CLC platform (see Box 1) or what we will further refer to as CLC, the physical setting where primary care services are offered are described as a space for social and economic activities for the surrounding communities, with a water supply; waste disposal provisions; and solar installations that power the devices, light the facility, and offer security lighting at night. In some places, early child care facilities and a business hub offering workspace and business training on demand also serve this broader 'community development' purpose (3) However, these activities are not a prime focus in the current evaluation.

Finally, the study focused on outcomes of the CLC instead of impact and consequently is not considered an impact evaluation. A further discussion on outcomes and impacts, in connection to the preliminary Theory of Change for the CLC model, proposed by Webster and Hanson, is included in Chapter 9.

BOX 1 THE (ORIGINAL) CLC CONCEPT (3,4)

The (original) concept of the CLC Theory or underlying assumption of the different CLCs as implemented by Philips in collaboration with the county or district. Philips is emphasizing the drive for affordable and effective healthcare delivery is fuelling a shift from fee- to value-based care – a system that aims to expand access to care and improve patient outcomes at lower cost. It is believed that technology is foundational to value-based care, whether it be an informatics infrastructure that allows us to actually measure value by systematically tracking outcomes and costs, or telehealth platforms that bring care closer to the patient, wherever they reside.

This theory is translated in the CLC concept. It offers a community driven holistic approach to improving primary and community care. The aim is to collaborate to improve community and primary health across Africa, by extending new or existing health facilities into social and economic community hubs, using exciting innovative and sustainable programs, technologies, and services. This is done in four ways

1. Providing a health and safe environment.
2. Tooling training and tracking: connecting community and primary care with other levels of care and capacity strengthening and outreach is an integral part of the so called CLC platform
3. Sustainability is a crucial factor in the Philips CLC program, and this includes two key elements; an Operational sustainability b Financial sustainability which includes enabling social and economic activities which can potentially provide local revenue streams.
4. Collaboration: developing an ecosystem of collaborations. Originally Philips added small new technologies to the existing service but at the co-creation table it became clear that there was a need for a more holistic approach or better parallel innovation of services, water and sanitation and electricity. The basic idea is also that no entity can do this alone; a co-creation process is needed between governments, counties or provinces and health authorities and the private sector and or other partners like international and or national government organisations.

METHODOLOGY

MIXED METHODS APPROACH

This formative programme evaluation follows a mixed-methods, cross-sectional design, combining various quantitative and qualitative research methods in one phase. Qualitative and quantitative data were first analysed separately and then compared and combined for the overall analysis and distillation of key findings and conclusions. In both study areas, a counterfactual facility (hereafter referred to as control facility) was selected to explore the plausibility of a causative link between CLC-specific interventions and outcomes measured.

Figure 1 Overview of all methods that are part of the assessment

CLCs AND STUDY AREAS

The CLC model has been rolled out in the counties of Kiambu, Mandera and Makueni. In Kenya, the CLCs are operated through a kind of co-production process and agreement between Philips and the Ministry of Health (MoH) in which roles and contributions of both parties are defined. In Kenya, staff (salaries) and essential medicines are provided by the County health authorities, while Philips has been supplying various inputs in terms of infrastructure and equipment and has also been implementing various training modules in relation to these inputs. By upgrading existing facilities from level two to level three, Philips had opened in Kenya two CLCs, one in Kiambu County and one in Mandera County. This evaluation study was conducted in Kiambu and Mandera counties. The two counties are vastly different in their location, population, and characteristics.

The first CLC was established in Githurai-Lang'ata health centre located in Kiambu County. Kiambu County is adjacent to Nairobi, located to the north of the city. Its population is estimated at roughly 2.5 million, mainly urban (60%) inhabitants. The ratio of doctors to the population is 1 per 6,667 inhabitants, and 1 nurse per 1,110 inhabitants. As the county increasingly urbanises, non-communicable diseases are on the rise, yet infectious diseases (respiratory, skin diseases, diarrheal diseases) still

remain the main cause of morbidity according to the County Integrated Development Plan for 2018-2022 (5). The Githurai Lang'ata CLC (hereafter referred to as CLC-Githurai) is more specifically located in Ruiru sub-county, which borders Nairobi, and has an estimated population of 180,000 inhabitants. CLC-Githurai is located in an urban, high population density area (6). The number of health service providers within the vicinity of the Githurai-Lang'ata CLC is high as the CLC is population density is also high. The CLC was launched in June 2014, in collaboration with the Kiambu County Government. The technology package of the CLC includes solar power, indoor and outdoor LED-Lighting, health care equipment, laboratory equipment, refrigeration, IT solutions, and water supply and purification. A focus of the CLC is to address infant mortality and improve maternal health. As part of the implementation, over 50 Community Health Workers (CHWs) were trained to expand the primary care services of the CLC to surrounding community. The CHWs were equipped with a CLC outreach kit providing a number of tools carried in a backpack (e.g. (blood pressure, pulse rate, oxygen saturation, temperature), middle and upper arm circumference, foetal dopplers to measure foetal heart rate. The control facility – located in same county - is named Gachororo.

In 2017 a second CLC was inaugurated in Mandera County, with a catchment population of around 40,000 people. The CLC in Mandera was established in collaboration with the United Nations Population Fund (UNFPA) and the county administration. It has the same package as Githurai Lang'ata CLC, including the CHWs outreach kit. Mandera county is a hard to reach and insecure area located in the far north east of Kenya, with Ethiopia to its north, and Somalia to its east. It is a rural county, with cross-border movement, and a pastoralist and predominantly Muslim population. The current population is estimated at 1.4 million (2017), with a low population density (57 inhabitants/sq. km), indicating a highly rural population. There are fewer health facilities compared to Kiambu county In 2013, there were 154 government healthcare workers for the whole county, and maternal mortality was estimated at 3,795 per 100,000 live births (7). The Dandu Health Centre (hereafter referred to as CLC-Dandu) is located within 30 km of the Ethiopian border (Figure 2). The control facility is named Burduras.

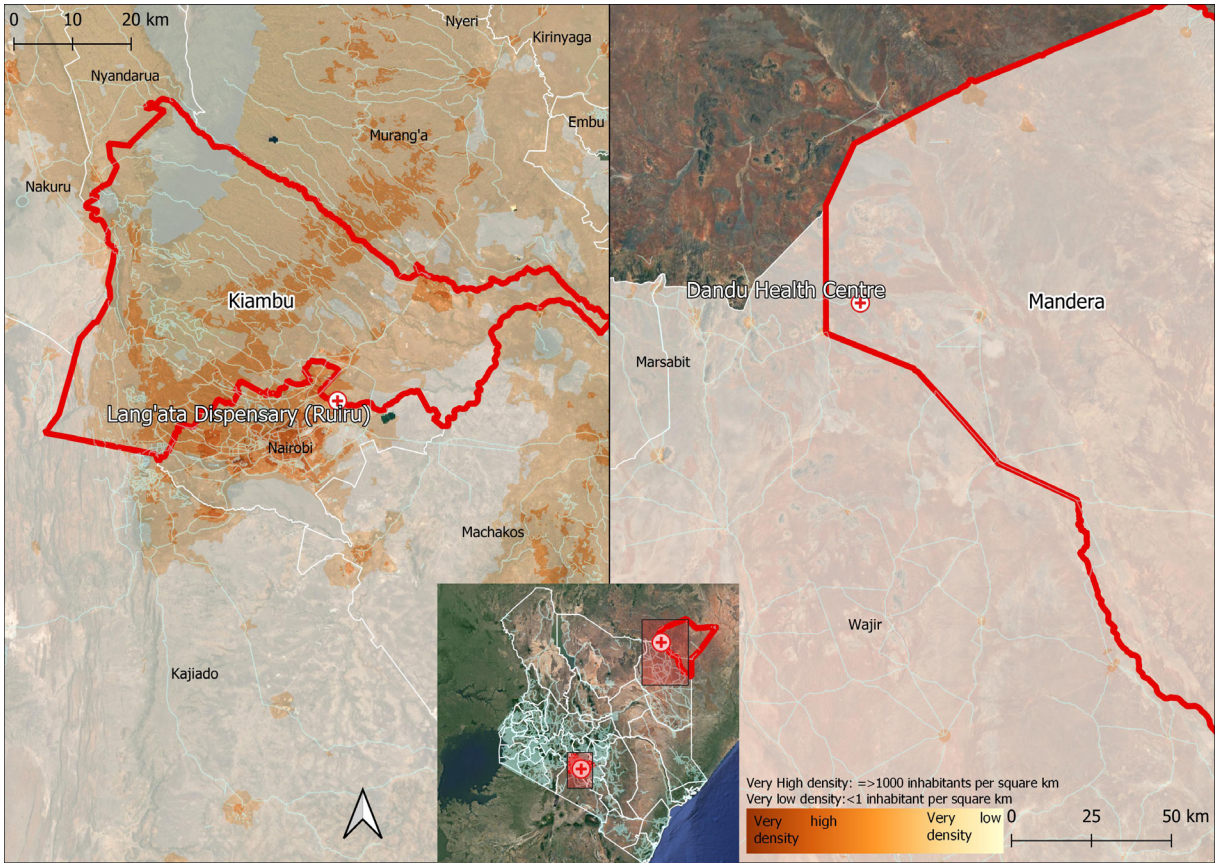


Figure 2 Location of the CLC and population density in their catchment areas

INDICATORS AND THEMES EXPLORED

To operationalise the study objectives, a research table (Annex 1a) was developed that provides an overview of the themes explored, variables measured, methods used, and the various respondents/participants solicited. The themes and variables are based on the conceptual framework used (Levesque model), an international literature review, previous relevant assignments, a CLC evaluability report conducted by London School of Hygiene & Tropical medicine (8) as well as inputs from Philips Research Africa during the kick-off meeting (Nairobi, February 2019).

DETAILED DESCRIPTION OF METHODS EMPLOYED FOR THIS ASSESSMENT

DESK REVIEW

The aim of the literature study was to gain better understanding of the primary care delivery arrangements in Kenya and South Africa (similar evaluation done in South Africa). The scope of the review went beyond Kenya and South Africa, to look at primary care delivery arrangements in LMICs and in health systems more in general, as the role of primary (health) care delivery, and the need for its strengthening has been reaffirmed as a core strategy to UHC and the SDGs(9)(10), and this international discussion is highly relevant and opportune to contextualize the CLC model.

For the literature review, the following sub-questions have been examined:

- How is primary care defined and how does it relate to other levels of healthcare?
- Which health services are offered at primary care level and which drugs, medicines and technologies are used to deliver these?
- How many people are served by primary care facilities (i.e., size of catchment area)?
- How and by whom are health services at primary care level paid for?
- What are the organisational features of primary care facilities, including human resources commonly employed and staff mix, management, and accountability mechanisms?

For the search, government websites were first explored, using terms like national health strategy, national health plan, national health development plan, health system in search engines. Subsequently, peer-reviewed literature was searched using the same key words in PubMed and Google Scholar. In this Kenya report, the literature review has more specifically been used to contextualize the functioning and performance of the CLCs, and their counterfactuals, within the Kenyan health system and its policies.

SECONDARY DATA ANALYSIS

The analysis of DHIS2 data attempted to contextualise the trends in service utilisation seen at the CLC and control and compare them to the wider local context in order to understand if service utilisation at the CLC was different from its surrounding (non-CLCL) facilities.

HOUSEHOLD SURVEY

The primary objective of the household survey was to assess healthcare seeking behaviour in the catchment population of CLC-Githurai. Due to resource constraints no household survey was conducted around CLC-Dandu. The household survey included determining when and to where were the respondents' last visit to a healthcare provider, for what reason, how they travelled to the location, if and how they paid, and how their experience was with the provider. Additionally, we collected socioeconomic data as well as information on awareness and utilisation of CHV activities. The household survey was programmed and administered using OpenDataKit (ODK) software.

The household survey posed a few challenges in constructing a sample. The lack of enumeration areas led to the use of a less traditional cluster sampling method. Inspired by conservation and ecology studies, the sampling was realized based on a transect line distance (see Box 2).

BOX 2: SAMPLING PROCEDURE EXPLANATION

A transect corresponds to a straight line (virtual or physical) of a specific distance (200 meters in our case). Each line had a start and an end point. The starting points were randomly distributed over a map of the inhabited areas (based on satellite imagery) and equally split between two distance groups: the closer (0-3km from CLC) and further distance group (3-6km from CLC). A 400m-metre wide circle band ("donut") located at 200 meters radius from the starting points was then created and the end point would then be randomly allocated in that band (Figure 3). Points that would land on a house or private parcel would be allocated to the nearest road. The starting and end points would then be transformed into geographical coordinates to enable the enumerators to identify to the starting location.

The enumerators started data collection from the start point and would have to reach the end point by walking whichever path they chose. The path was written down with the houses enumerated along the way to the end point. Once the endpoint was reached, the enumerators walked back the same path backward and started screening the houses to identify respondents.

Sixteen clusters were drawn out, each with a minimum required number of 27 households to be interviewed. Based on demographic data, the average size of a household in Kenya urban areas was estimated to be close to four. We used a conservative estimate of three members per household and calculated a minimum sample of 433 households needed, amounting to an estimated 983 individuals, to have a sample sufficient to power the analyses. Six field data collectors were dispatched as a single team in order to complete a cluster within a day and reduce data collection time.

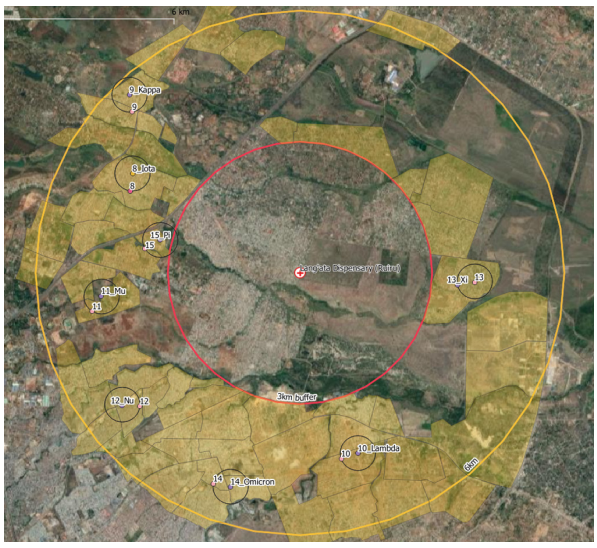


Figure 3 Transect sampling cluster location on the 3-6km area. Yellow areas represent inhabited areas

CLIENT EXIT INTERVIEWS

The post-consultation questionnaire, or client exit interview, was used to assess the experience in receiving care directly after consultation, relating to professionalism, comfort, respect, and perceived quality of care received by the patient. Users were approached prior to their consultation to ensure a sufficient number of respondents. Data was collected on the perceived experience of the facility users for preventive and curative services. Preventive services were defined as family planning, antenatal care and child welfare clinic, and curative services as the comprehensive care clinic and outpatient department. A total of 516 questionnaires were collected across the Kiambu (CLC-Githurai, 131; Gachororo, 123) and Mandera (CLC-Dandu, 135; Burduras, 127) facilities. Additionally, the post-consultation interviews were used to screen for candidates for the in-depth interviews or the focus group discussions that were part of the qualitative side of this assessment. As with the household survey, the client exit interviews were programmed and administered using OpenDataKit (ODK) software.

QUALITATIVE INTERVIEWS

Fifty-seven in-depth interviews (IDIs) (30 in Kiambu and 27 in Mandera) were conducted with (young) women of reproductive age (15-19 and 20-49 years) and (young) men, including users of the CLCs and users of the control facility, to get in-depth insights about preferences and barriers when seeking primary care as well as knowledge and awareness about the range of primary care services offered at the CLCs.

Fifty-one key informant interviews (KIIs) (35 in Kiambu and 16 in Mandera) were held with identified key stakeholders. KIIs with facility staff, facility management, county health authorities, and community representatives served to explore the views on the relevance of the CLCs and the services offered, the quality of care, the management of the CLCs and community participation.

Twelve focus group discussions (FGDs) were conducted (eight in Kiambu and four in Mandera) with (young) women of reproductive age to explore healthcare seeking behaviours regarding primary care in the catchment population of the different CLCs. Special focus was placed on exploring changes since the opening of the CLC on healthcare seeking behaviour as well as on use of health services, quality of the services and functionality of community health volunteers.

Table 2 provides a detailed overview of all the qualitative interviewed and focus group discussions conducted.

Table 2. Overview of qualitative interviews and focus group discussions

KIAMBU	MANDERA
30 IDIS (15 CLC, 15 control) Young women 15-19 (4 CLC, 4 control) Adult Women 20-49 (6 CLC, 5 control) Young men 15-19 (2 CLC, 3 control) Decision makers* (3 CLC, 3 Control)	**27 IDIS** (14 CLC, 13 control) Young women 15-19 (2 CLC, 5 control) Adult Women 20-49 (8 CLC, 4 control) Young men 15-19 (1 CLC, 1 control) Decision makers* (3 CLC, 3 control)
35 KIIS Facility staff (9) (6 CLC, 3 control) CHVs (9) (5 CLC, 4 counterfactual) Traditional birth attendant (1) Health authorities (4) Health centre committee (1 CLC) Religious leaders (2) Community representatives (4) Village elders (2) Civil Society Organisations/Faith Based Organisations (3)	**16 KIIS** Facility staff (5) (4 CLC, 1 control**) *Control facility was run by 1 nurse only CHVs (4) (2 CLC, 2 control) Traditional birth attendants (2) Health authorities (2) Community/religious leaders (3)
8 FGDS (4 CLC, 4 control) Young women 15-19 (4) (2 CLC, 2 control) Adult women 20-49 (4) (2 CLC, 2 control)	**4 FGDS** (2 CLC, 2 control) Young women 15-19 (2) (1 CLC, 1 control) Adult women 20-49 (2) (1 CLC, 1 control)

** Mothers-in-law, husbands, elderly; ** Control facility was run by 1 nurse only*

For further contextualization of the findings a total four expert interviews was done, two interviews with initiators of the CLC concept, one interview with the Kiambu county representative and one with the technical support staff to CLC-Dandu. IDIs, KIIs and FGDs were done by the local research teams face to face. The expert interview as done by a KIT senior advisor and done through Teams or Zoom.

FACILITY AND CONSULTATION OBSERVATIONS

The facility observation tool collected mainly structural information on the components of realised quality of care, including general service domains (human resources, facility infrastructure, availability of basic amenities, basic equipment, standard precautions for infection prevention, diagnostic capacity, availability of essential medicines). Structure and infrastructure were assessed based on a standard list of items. Each facility—two CLCs, two controls—had an observation.

Consultation observations allowed better assessment of the process dimension of quality: whether the care delivery during consultation was matching the standards set nationally or internationally with regard to evidence-based practice as well as the relational aspects of the interactions. Consultation observations were planned per type of consultation with a minimum of six consultations per type. The types of consultations included: under 5 child clinic, chronic conditions consultations, family planning, and antenatal care. Common to all types of consultations were rapport-

building indicators to be filled in by the observer based on the provider's behaviour toward the user. In Kiambu, both the CLC and control had nine observations per consultation type and respectively 40 and 41 observations for rapport building. In Mandera, one observation per consultation type was collected. The lack of cooperation with the facility in charge in Mandera to allow client observations prevented the team to conduct consultation observations.

DATA ANALYSIS

All of the qualitative interviews and FGDs were transcribed and translated into English. A thematic analysis was done using a predefined coding framework based on the research table (Annex 1a) and evaluation questions (Annex 1b) of the study.
For the client exit interviews, descriptive and frequency analyses were conducted to assess client characteristics and accessibility. Indicators were used to report client satisfaction and defined as the average level of satisfaction. The indicators used were:

- Behaviour of health professionals, composed of three questions regarding the friendliness of the staff, friendliness of the provider and the perceived ability to discuss problems regarding the health issue
- Infrastructure, consisting of 3 questions regarding how convenient it was to travel to the facility, the cleanliness of the facility and the privacy the clients had during consultation
- Services, composed of 8 questions regarding the trust in the provider's skills, the amount of explanation, the quality of advice, the procedure or treatment, the availability of services, the costs of services, the time spent during consultation and the waiting time
- Satisfaction with the overall visit based on one single question
- Total satisfaction score indicator, being the average level of satisfaction on all questions.

Difference in satisfaction levels between the CLCs and their counterfactuals were assessed using a one-way ANOVA analysis or Kruskal-Wallis test. Factors known to influence satisfaction were controlled for using multiple regression. Analyses were performed using STATA release 15.

The household survey data was analysed using descriptive and summary statistics to establish household- and individual-level characteristics. Analyses were performed using R Studio version 1.3.1093.

The analysis from the above-described components and the facility and consultation observations was assessed in total by a multidisciplinary team for triangulation and to draw conclusions on the CLC model's ability to improve primary care service delivery. In this process the literature review served to contextualize findings.

QUALITY ASSURANCE

The study preparation and implementation was guided by our internally developed, externally- and internationally-validated good epidemiological practice guidelines referred to as the BRIDGE statement: bridging research integrity and global health epidemiology statement (11). Prior to implementation of field work a quality assurance plan was developed following a practical tool for quality assurance in epidemiology (KIT Open Data Quality Tool, publication in preparation). The tool includes a matrix consisting of questions and quality dimensions. Four elements can be distinguished related to 1) study planning (including e.g. development of tools, recruitment of field staff, training of field workers, data collection, data management); 2) Risk analyses: to document a) what can go wrong? and b) what are prevention strategies?; 3) quality control: to identify quality control practices that can be applied, for example spot checks in the field, and documentation of the outcomes; 4) Quality improvement: to identify corrective and mitigating activities to be implemented. The quality assurance plan was agreed upon and used by KIT and the local implementation team.
The data collection was conducted by a local research team, supervised by a local consultant. Prior to data collection a 3-day training was conducted in Nairobi, facilitated by the local consultant and KIT international expert. The local research team in Mandera received training from the supervisor who attended the training in Nairobi. Qualitative and quantitative data collection methods were piloted in a health facility in Kiambu county and tools were revised based on the pilot.

ETHICAL CONSIDERATIONS

Ethical approval was provided by the Research Ethics of KIT Royal Tropical Institute (REC) (S-100, May 23, 2019), the Internal Committee Biomedical Experiments (ICBE) of Philips Company (ICBE-2-32453, 2013-0167), August 30, 2019) and the Amref Ethics and Scientific Review Committee (ESRC) in Kenya (ESRC P660/2019, July 11, 2019). The study was conducted following the ethical considerations of the protocol. Informed consent was asked of all respondents and participants of the study who were informed that they could refuse to answer questions and could stop the participation at any time without any repercussions. Data collection was done in safe and comfortable environments. Only the research team had access to the data and identifiers were removed from the transcripts. The research team included male and female research assistants who spoke the language of the study area where necessary. Prior to data collection, the research team was trained on ethical issues to ensure that guidance on ethical conduct was clearly understood and implemented.

FINDINGS: RELEVANCE OF THE SERVICES OFFERED

The assessment of the relevance of the services offered through the CLCs is based on an analysis of whether services respond to the most common health problems of the targeted populations (that means: the local burden of disease), whether they respond to their perceived health needs, whether they are aligned with national policies and guidelines, and the mechanisms in place to reach out to different, and particularly vulnerable, population groups (e.g., those living in most remote areas).

KEY FINDINGS

- The CLCs established a good rapport with the targeted population at the outset through the consultative process of needs- and priority assessments.
- The CLC concept and the Kenya Health Policy share the central commitment to strengthening primary care as a key approach to ensuring good health and well-being for all.
- The services provided through the CLC were generally responding well to the (perceived) health needs of the targeted population, and to the burden of disease (as a reflection of the 'true' or objective needs) in Kenya. Although mental health problems represent a substantial burden of disease, they are not reported as such by the respondents.
- The main mechanisms to regularly monitor the relevance of the services offered by the CLC and other primary care facilities from the perspective of the communities were the facility health committees of the CLCs and control facilities, which include representatives of the surrounding population. Community health committees (CHCs) and CHVs serve as informal mechanisms to link the perceived needs of the communities to the CLCs.
- The maternity wards of the CLCs were highlighted in both areas for providing services that were not available prior to CLC establishment (first time delivery and ultrasound)
- In general, the CLCs had constraints in capacity to respond to the high demand of services, particularly highlighted for CLC-Githurai regarding the Comprehensive Care Clinic (HIV, TB). This might be due to a higher demand for services that is not matched by a proportionate increase in resources, either human, medicines or other, from the side of the public authorities.
- The CLCs, as any other public healthcare facility, were well aligned with the Kenya national policies and more specifically strategies on primary care and community health.
- Backpacks for CHVs were provided in both CLCs initially, but not for every individual CHV, and not all equipment remained functional over time. Contents of the backpack seem mostly relevant, but some innovative equipment needs to be validated for the skills profile of CHVs, and aligned with priorities of the community service package, as defined in the Kenya Community Health policy. Technologies like pulse oximetry and non-invasive blood pressure measurement are nice examples of innovative technologies that can fit in an integrated and comprehensive strategy for child health respectively non-communicable disease, provided their use is well followed up for feasibility and effectiveness challenges. Proper follow-up on the use of backpacks and equipment, and the replenishment of supplies needs more attention.
- In all areas, CHVs played a key role in reaching specific population groups like children, elders and those living in more remote areas groups and making referrals from the community to the CLC or other primary care facilities. At CLC-Githurai, there was a perceived shortage of CHVs. CLC-Dandu organized outreach activities more frequently, sometimes also involving CHVs.

DO THE CLCs RESPOND TO THE NEEDS OF THE TARGETED POPULATIONS?

The needs assessment conducted during the design phase of each CLC was found to be the main mechanism to assess the needs and priorities of the targeted population. Through the needs assessment, consultations with different population groups—women, youth, community health volunteers or community leaders—took place. These consultations focused on collecting insights for the facility plan and how the facility could have an impact on the community. No indications of similar processes were found in the control areas. In all the areas, the main mechanisms for monitoring the needs of the targeted population were the facility health committees, which included representatives of the surrounding population. CHCs and CHVs served as an intermediate between the perceived needs of the communities and the CLCs. Some informants argued that meetings between health authorities and facility management also served to discuss trends in the needs of the targeted population.

Participants affirmed that the priorities shared during the needs assessment for the design of the CLC had generally been addressed. In Githurai, participants highlighted the following priorities: a maternity ward, laboratory, paediatrics with properly separated spaces as well as clean water, access roads, and improved security. In Dandu, the need for better roads and a maternity ward were underlined priorities. The maternity ward was particularly highlighted as a key priority and need in both areas, which was addressed by the two CLCs.

While in Githurai facility there was no maternity ward, in Dandu the maternity ward was providing services that were more limited prior to CLC establishment. In Kiambu, participants argued that the CLC was one of the few facilities receiving women for a first-time delivery in the area, as other primary care facilities tended to refer first-time deliveries due to the fear of complications. In Mandera, an underlined added value of CLC-Dandu was the ultrasound service which was generally absent in other primary care centres. However, various participants remarked that the CLC had not been able to address the challenges to respond to emergencies, including pregnancy and delivery complications, and emergencies due to weak referral systems and the difficulties in accessing ambulances on time.

> “Dandu facility being a superior facility compared to other facilities because of the availability of some services that are not there in our health centre for example we have an ultrasound service in this CLC, and it does not exist in most health centres that service can only be accessed at the sub–County Hospital or the County referral hospital.” (KII, Health authority, Dandu)

Clean water was another commonly mentioned priority addressed by the CLC. The remarks on perceived needs not being addressed generally referred to services that were not necessarily within the remit of a primary care facility, such as, cancer screening, the improvement of roads or the lack of an ambulance.

The health services provided through the CLCs respond to the burden of disease in Kenya as well as to the main perceived health needs by the targeted population. Communicable, maternal, neonatal and nutritional diseases make up the largest share of the national burden of disease in Kenya in terms of disability-adjusted life years (DALYS) (12). The CLCs provided services for most conditions within these disease groups; the CLCs' CCC, maternity ward and child welfare clinic respond to the four main contributors: HIV/AIDS, maternal and neonatal disorders, respiratory infections and TB, and enteric infections. Only mental disorders and skin diseases were the main (among the first 10) contributors to the national burden of disease that were not explicitly mentioned by study participants as a focus of the CLCs.

Malaria, pregnancy and delivery complications, TB, tonsillitis, family planning, typhoid, flu, cold, stomach-ache and high blood pressure were the most common problems reported by respondents in Githurai. Stomach problems, infections, malaria, chickenpox, cholera, fever, measles, and hepatitis were the main reported health problems in Dandu. Hence, the findings indicate that the service provision by the CLCs was responding to the main perceived health needs by the populations in Kiambu and Mandera.

Most study participants explicitly expressed that the CLCs respond to the main needs and priorities of the population of the surrounding areas. However, a common remark was the constraints in service capacity of the CLC to respond to the actual demand, particularly for the comprehensive care clinic (CCC). CLC staff and CHVs highlighted that there are too many people needing tests for infectious diseases, such as HIV, but few clinical officers available to do so.

ARE THE CLCs' INTERVENTIONS ALIGNED WITH NATIONAL POLICIES AND STRATEGIES?

The CLC concept had clear synergies with the objectives of the MoH Kenya Health Policy, particularly on providing essential healthcare and strengthening the collaboration with private and other sectors that have an impact on health. The primary health care strategy of Kenya does stress the importance of community-based healthcare and the involvement of CHVs as a specific part of the primary care policy. The CLC component of training and equipping CHVs thus fits well into this national policy. In fact, the two respective CLCs in Kiambu and Mandera work closely with the county government health officials as the two are owned and run by the government. All key informants were clear on the fact that the CLCs are part of the public health system and therefore follow the same regulations and guidelines as any other primary care facility.

Hence, the approaches, tools and interventions were congruent with other public primary services. The CLCs mainly used technical guidelines from the Kenya MoH disseminated through the respective county government. and guidelines from the World Health Organization.

HOW DO CLCs REACH SPECIFIC POPULATION GROUPS?

In Kiambu and Mandera, there were two main mechanisms to reach to the most vulnerable groups: CHVs and outreach activities by CLCs or health authorities. These mechanisms were being used in all areas, by the CLCs as well as the selected control facilities. In all areas, CHVs were playing a central role in reaching out to the most remote and vulnerable populations. The role of CHVs included informing the community about health topics and making referrals to primary care facilities (CLC or others) when needed, targeting the most vulnerable: children, elderly people and those who could not access the facilities.[1]

In the CLC areas, CHVs had received backpacks with medical equipment from Philips. However, CHVs from CLC-Githurai (five backpacks provided in 2015) as well as from CLC-Dandu (10 backpacks provided in 2017) mentioned limitations in relation to these backpacks.[2] In Githurai, the argument was that not everyone received a backpack as promised. One CHV from Githurai who had a backpack argued that sharing it was difficult because each CHV was allocated to certain areas. In Dandu, CHVs as well as facility staff said that these backpacks were only available at the beginning.

> "Ten people were given backpacks by Philips with small equipment but now they are not working. They were assigned 25 households per person to do immunization, and help poor people to access services since the only cost at the facility is buying of a book at fifty shillings but when that patient is brought by the CHV he will incur that fifty shillings of the book even at the ultrasound, those backpacks don't exist now and Philips used to give CHVs some incentives but it has stopped now." (CHV, Dandu)

The contents of the backpacks provided in Githurai and Dandu were similar and included reporting forms (supplied by County authorities) an in-ear thermometer, non-invasive blood pressure measurement, MUAC tape for identifying undernutrition, a solar lantern, and a pulse oximeter. All these technologies appear relevant for the community health service package. Pulse oximetry is a nice example of an innovative technology, that can help to allow timely referral of severe pneumonia cases to the health centre; feasibility of its use by CHWs is still being researched. It was not clear to what extent the backpacks also included additional items supplied by the MoH in order to cover the full needs of the service packages, as defined in the Kenya Community Health policy. In the expert interviews it became clear that there are differences according to the contexts and the needs of the community. The backpacks also came with training sessions; we are not sure whether this training specifically addressed the use of the Philips supplied technical equipment, or that it was comprehensively covering the complete services packages of the CHVs.In Githurai,

1. Community health volunteers were active in their community health units, the structure used under public health to reach certain communities. Every community health volunteers was allocated to an area and linked to certain households. These allowed them to identify cases more easily than needed referral to the primary care facility or CLC.
2. As part of the CLC implementation CHV were equipped with a CLC outreach kit providing a number of tools carried in a backpack (e.g. (blood pressure, pulse rate, oxygen saturation, temperature), middle and upper arm circumference, foetal dopplers to measure foetal heart rate.

In Githurai, CHVs reported the challenge of having to serve a large catchment population while the number of CHVs had significantly decreased. CHVs argued that they were not able to reach and follow all cases in their allocated areas and the decrease of available CHVs was attributed by some to the lack of payment. One community health volunteer also stated that the coordination and communication between the CHVs and the health providers at the CLC was not adequate. In the control area, one interviewed CHV referred to the need for more CHVs, however these remarks were stronger and more common among CHVs in Githurai.

Although outreach activities are generally organized and led by facility staff and health providers, in CLC-Dandu, CHVs were also involved in outreach activities. Moreover, in comparison with the control facility in Mandera, CLC-Dandu's CHVs seemed to be more known to the catchment populations. CLC-Dandu also seemed to organize outreach activities more often than the other facilities. Key informants from CLC-Dandu said that the CLC organized outreach twice per week in coordination with the county. According to a key informant in Dandu, outreach activities were the only mechanism to engage communities with the CLC and key to CLC responsiveness.

The outreach activities focused on health education as well as screening to identify cases that would need follow up, thereby linking outreach with the follow up and referral role of CHVs. Moreover, it was found that facility staff and CHVs had telephone contact with communities through which cases and health needs could be reported.

> "They are very important we cannot work without them, like at the antenatal and MCH clinic we have defaulter tracing registers whenever the child is to come for immunization, we have the landmark or the telephone number so we give this information to the CHVs they go to look for them, at the maternity they are shy from male nurse, so we send the CHVs to educate such mothers about it." (KII, Facility staff, Dandu)

In Kiambu, while facility staff from the CLC and the control facility affirmed that outreach visits were being organized, these seemed to be less known by the population living in the surrounding area. Participants referred more to national outreach activities organized at county level such as the Beyond Zero campaign.[4] One community health volunteer from Githurai expressed that the Beyond Zero campaign and polio campaigns were the only outreach activities in which they participated.

3. See: MOH, 2020, Kenya Community Health Policy 2020 – 2030., pp. 17-23.
4. Beyond Zero campaign was a regular needs-based outreach organized every six months in each sub-county to bring certain services (immunization, health education) to most remote areas. Nurses, clinical officers, doctors and CHVs could be involved.

FINDINGS: HEALTHCARE SEEKING BEHAVIOUR

In our evaluation, healthcare seeking behaviour describes the behaviour and the factors influencing the action of seeking, accessing, adhering to, and utilising preventive, curative, and rehabilitative care. Healthcare seeking behaviours start with individual healthcare needs; followed successively by the perception of these needs by that individual; the decision-making to seek care; the process of accessing care; then the actual use, and if needed the continued use of services and adherence to treatment and advice; up to the outcomes of service use, in the sense of improved health, and satisfaction with the services received. Healthcare seeking behaviour also influences the choice of where, how, when, and by whom to receive care. Finally, healthy behaviours with regards to diet, sexual habits, personal hygiene, physical activity, and risk inclination extend the concept of healthcare seeking behaviour to health seeking behaviour. To operationalise healthcare seeking behaviours, we followed the Levesque framework (13), that distinguishes a set of supply factors (service and policy related factors: approachability, acceptability, availability and accommodation, affordability, and appropriateness), and a set of demand factors (personal/patient and social/community factors: ability to perceive, ability to seek, ability to reach, ability to pay, ability to engage), that influence each step of the healthcare seeking behaviour, as described above. (see Annex 2, Figure 1 and Table 1 from Richard et al (14) for detailed definitions of the concepts in the Levesque framework) Healthcare seeking behaviours were assessed using quantitative and qualitative methods, allowing for the triangulation of findings.

KEY FINDINGS

- As mentioned in the previous chapter, the CLCs address the most important needs as perceived by the population, such as malaria, reproductive services, pneumonia and enteric diseases. The needs mentioned in the household survey corresponded to a large extent to those expressed by CLC users. Some needs for particular age/sex groups are not sufficiently addressed e.g., eye problems, sexual health issues, substance abuse and mental health.
- 21% (n=266, N= 1,246) of survey respondents in the CLC-Githurai catchment area needed to visit a healthcare provider, of which 91% (n=234) actually visited a provider.
- The CLCs provide services in line with expressed health care needs with slight differences between Mandera and Kiambu corresponding to their rural and urban contexts.
- In Dandu, the rural environment, there are fewer options for alternative service providers. Most users came by foot and considered the waiting times reasonable. Particular satisfaction was expressed about the language-specific, and culturally appropriate services provided.
- In Kiambu, as an urban area, individuals have no difficulty in accessing a variety of alternative providers: choices are more likely to be made by weighing price, quality, waiting time and direct accessibility. The CLC provides extra safety through some of its infrastructure and 24-hour opening time, although the latter seems only applicable to a subgroup of users.
- Based on CEI CLC-Dandu users were more often charged for services at the CLC (22% of users) compared to the control (8% of users), despite the free services status of both facilities. We were not able to uncover the reasons for this difference.
- There was no observed added value of CHVs on the reach and use of CLCs. There was often no clear picture on their precise role or activities at the interface between communities and CLCs.

TO WHAT EXTENT IS THE POPULATION AWARE OF ITS HEALTHCARE NEEDS AND THE EXTENT TO WHICH THESE NEEDS CAN BE ADDRESSED AT THE CLC?

The needs reported by respondents at facilities (from exit interviews and IDIs) and those collected in the catchment area population through the household survey matched: fever and coughing/breathing difficulties were the most regularly reported reasons for visits by household survey respondents. Abdominal pain followed, which can be a symptom of many issues such as menstrual hygiene, enteric diseases, or even the incapacity to conceive. Most common problems for which services were sought by both the CLC users and the control facility users were malaria (fever), flu, maternal health concerns, and enteric disease (particularly typhoid).

Individuals aged 15 to 19 expressed very specific needs during in-depth interviews and focus group discussions that did not appear in the household survey or the client exit interviews: abortion services, substance abuse services (mainly in Kiambu), and STD services, which were considered separately from HIV from respondents. Among all groups, “eye problems” were mentioned.

When disaggregated by sex, some particular issues became more prominent. Female individuals mentioned several issues related to menstrual hygiene (“bleeding”, “menstrual blood issues”, “issues of hygiene”, etc.) and reproductive and/or sexual health (“antenatal care”, “family planning”, “STD”, “rape”) in all locations. For women of reproductive age, menstrual problems were also frequently reported and, specifically to Mandera, delivery complications were often mentioned. Among men, drug abuse and injuries were highlighted more frequently, but also STDs and chest problems.

Within the catchment area of CLC-Kiambu, for twenty-one percent (266 out of 1,246) of household members it was declared by the main respondent that they had an illness within three months preceding the survey (Figure 4). For seventy percent (186 out of 266) of these it was declared they also needed to visit a health provider for this illness. In addition, 7% (87 out 1,246) of the individuals expressed a need to visit a health provider for reasons other than illness. In total, 234 (91%) of 258 (171 for illness, 72 for other reasons (e.g., pregnancies, immunizations) and 15 for both illness and other reasons) individuals who had expressed a need to visit to a service provider actually visited a healthcare provider after expressing a need for a visit. (Figure 4) Given this very high proportion of expressed needs met, accessibility and utilization of services appear to be high in this area. This is also explained by the wide availability of healthcare providers in Kiambu which is densely populated county.

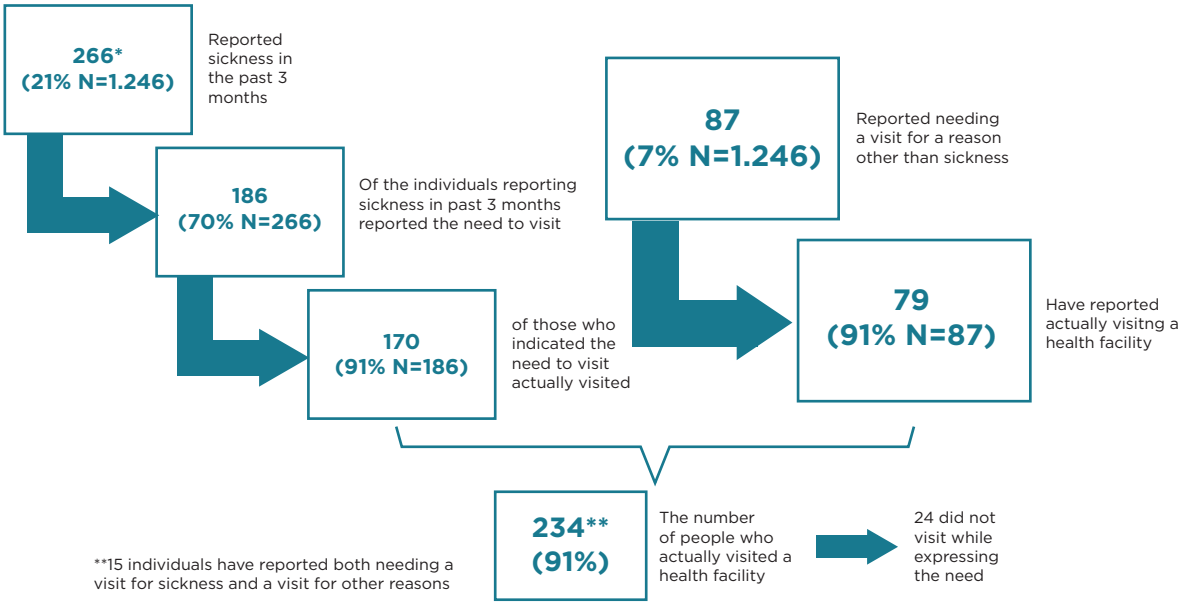


Figure 4 Flow diagram of people actually visiting a health facility

In both CLCs, participants were well aware of the offer of the following services: the maternity ward, ANC services with ultrasound, family planning services, the comprehensive care clinic (HIV testing and ARVs, TB), outpatient department, childhood immunizations, pharmacy, and laboratory. A particularity of CLC-Dandu was that study participants mentioned the availability of a nutritionist when asked about the services provided by the CLC which was not explicitly mentioned for CLC-Githurai. The screening of cervical and breast cancers as well as for hypertension, diabetes and psychiatric problems seemed to be provided only at CLC-Githurai and not at CLC-Dandu, as no participants from Mandera referred to these services.

Community outreach through CHVs is one of the CLC platform components expected to contribute to the approachability of the CLCs. It was expected that CHVs were an important factor in healthcare seeking behaviour for users or potential users through awareness raising, screening and referral. Specifically, the provision of backpacks containing tools such as vital signs monitoring (blood pressure, pulse rate, oxygen saturation, temperature), middle and upper arm circumference, and foetal dopplers to measure foetal heart rate. All these activities potentially contribute to the role of the CHV at the interface between target populations and CLC, thus contributing to approachability.

Yet, only 31% of household survey respondents indicated to be aware of CHVs being active within the catchment area of the CLC in Kiambu. Respondents from the IDIs seemed in general more aware of CHVs and their activities compared to the household survey respondents. It should be noted that this result may be biased as the IDI respondents were all users at facilities. Some respondents, in particular males in Kiambu, felt the services provided by the CHVs were targeting women primarily.

The role and services of CHVs in both Kiambu and Mandera were wider than helping with health-related activities. Notably, respondents reported that CHVs provide hygiene and clean water advice (“minor services”), in addition to health-related activities.

In both Kiambu and Mandera, questions about the CHVs regarding who they are, where they are from, or what they do were raised by respondents, highlighting issues of trust. In both locations, respondents mentioned CHVs' involvement with polio vaccination. Although no campaign (in Kiambu) took place in recent times, and importantly, many respondents mentioned having heard of them but had actually never seen them.

Consequently, the value of CHVs cannot be unambiguously determined. In Kiambu, CHVs seem to have a limited effect to improve access and the use of primary care services, in part due to the wide offer of services available, and the anonymity that can be quickly found in densely populated setting. On the other hand, in Mandera, the lack of providers potentially promotes the position of the CHVs and their capacity to bridge users with services. CHVs could make services much more approachable by indicating their existence, but also by bringing the service to the user when other accessibility barriers exist.

CLC-Githurai enjoys a very high awareness within its most direct catchment area. Seventy-eight percent of households within 3 km distance from the facility knew about the facility; in households located more than 3 km away this proportion decreased to 38%. Sixty percent of households within three kilometres who had heard of the CLC had a member of that household visit it at least once, dropping to 31% beyond three kilometres. For those who had answered positively to having visited the CLC, 88% had visited it more than a month prior to the survey. Comparing these results to users of the control facility (approximately 20km north of the CLC), very few respondents in the interviews mentioned having heard of or knowing the CLC-Githurai.

Informing the CLCs surrounding populations on the range of services provided was done through similar mechanisms as in non-CLC facilities: CHVs, announcements over radio, TV, during church masses, and through direct contacts (friends, employees). We did not analyse the exact content of the messages and their receptions by the community, nor the frequency and timing of these messages. In both places, getting information directly at the facility, was mentioned as an important source of information on the range of services offered. In Mandera, most of the information relayed about the CLC was done by the health providers at the facility, including on the services provided. It was, in general, the preferred source of information, although youth also highlighted their preference for CHVs as a source of information. In both Mandera and Kiambu, the CLCs were trusted as service providers and reported to offer good quality of services. The sentiment was more positive for CLC-Dandu (see Chapter 7 for a further discussion on quality of care).

TO WHAT EXTENT ARE THE SERVICES PROVIDED AT THE CLC ACCEPTABLE TO THE POPULATIONS SERVED?

Acceptability refers to the professional, cultural, and social factors that make people accept (or not) the services provided; this may relate to the characteristics of the services provided or to characteristics of the provider (e.g., sex of provider; age of provider, particularly for deliveries, attitudes of providers, for instance towards adolescents, etc.) This concept has both a supply and a demand side according to Levesque framework. The demand side in Levesque is called ability to seek care', and includes cultural factors, gender, autonomy of people to seek care, and general social values (13).

Attitudes of staff and CHVs was not perceived differently by CLC users and control users in both areas. In particular, the overall reports were positive, with only a few mentions during IDIs of "rudeness", "slowness", and specific preferences for younger staff ("listens") or older staff ("friendlier", "skilled"). In general, skills and counselling were appreciated by users. Users also tended to trust their providers.

A notable difference reported was the preference for female providers in Mandera (CLC-Dandu and control facility) which could be associated with societal values. Female users strongly preferred female providers, as female users mentioned shyness when faced with a male provider.

The scarcity of staff (lab technician, radiologist/sonographer), rather than their attitude, was noted by respondents as a challenge at CLC-Dandu, yet they strongly appreciated that the staff spoke similar languages to users. While both control facilities and CLCs were trusted by users, a language barrier was often mentioned in Burduras (control), an issue that did not exist at CLC-Dandu.

In both Mandera and Kiambu, clients of CHVs positively assessed their services and trusted them, noting stronger command of the local language (in Mandera). CLC-Githurai had more positive reports on services provided, particularly with respect to "cleanliness", "information given", and "doctors documenting everything". Yet users in all four facilities reported overall satisfaction on the services and their quality.

The two Kiambu facilities were often compared to private facilities by users themselves. They highlighted how private facilities were often faster and had better opening times; yet the trust, quality of services, attitudes of staff, was more controversial. As expected, the prices of services were also mentioned as another negative aspect of private providers.

CAN PEOPLE EASILY USE THE CLC IN TERMS OF ABILITY TO REACH AND USE SERVICES, ACCOMMODATION, AND AFFORDABILITY OF SERVICES?

Availability and accommodation refers to the extent to which health services can be reached, used, and in what conditions. More specifically: availability constitutes the physical existence of health resources with sufficient capacity to produce services and refers not only to the infrastructure as such, but also geographical access such as distance, density, and transportation system, and to essential resources being available in the facility, and consequently, readiness for delivery of essential services at a certain quality level. As essential resources availability, including human resources for health, essential drugs, etc. are also structural components of quality of care, these elements are discussed under 'quality of care'. **Accommodation** refers to characteristics such as opening hours, arrangements for appointments, physical access for disabled people.

Affordability reflects the economic capacity for people to spend resources and time to use appropriate services. It results from direct prices of services and related expenses in addition to opportunity costs related to loss of income.
The demand side of availability/accommodation and affordability are called 'ability to reach' respectively 'ability to pay'. (13).

In Kiambu, reaching and utilising health service providers is not a major issue due to the wide offer of health facilities in the area. The CLC provides extra safety through the lighting and 24-hour opening time, although the latter part seems relevant only to a subgroup of users. In Mandera, accessibility is more difficult to assess given that the answers were obtained from users of the facilities, we may have missed the most vulnerable or hard to reach individuals. Among those who reached the CLC, most came by foot and thought the waiting times at the CLC were acceptable. Extra satisfaction was mentioned due to the language-specific services provided to the local population.

The ability to reach of most users was observed as high, with most going to the closest facility. CEI respondents mentioned the CLC was the closest facility (60% CLC-Githurai, 74% CLC-Dandu) while for users of the control facilities, similar percentages were reported (67% Gachororo, 73% Burduras). (Annex 3, table II) In the catchment area of the CLC-Githurai, we found in the household survey that the main incentives to go to a facility were reported to be "closeness to home", "gratuity of services", "quality of staff", and "referral to a particular facility". Of all people who indicated to have sought care in the household survey 55% of users went to the closest facility. Reasons for CLC-Githurai CEI respondents not to go to the closest facility included higher cost of care (31% of respondents that did not go to the closest facility) and bad reputation (26%) (Annex 3, table II)

Eighty nine percent of CLC users (CEI) in both Kiambu and Mandera had visited the facility before; a similar percentage was found for the control facilities at Gachororo and Burduras (83% and 90% of CEIs respectively). This is higher than we found in

household survey respondents living in the catchment area of CLC-Githurai: when asking household respondents who had used any service in the past three months prior to the survey if they had visited that same facility before, 65% said yes, suggesting a tendency at CLCs to go back to the same facility. We are unable to state if this was for the same or for a different condition.

In Kiambu and Mandera travelling by foot to reach the facilities (CLC) was amongst the most common modes of travel to a health facility together with motorbikes (Mandera) or public transport (Kiambu) as reported by IDIs respondents. Seventy-six percent (177 out 234 individuals who had used a facility) reported 30 minutes or less to reach the facility in the household survey (Annex 4). Key informants mentioned the poor quality of the road and frequent flooding in Mandera made the visit to the CLC difficult. CLC-Dandu was reported to have provided a closer service to neighbouring Ethiopian communities, who visit the CLC-Dandu especially for medication. This highlights an important accessibility factor in light of the community around both the CLC and the control: the lack of providers in the area and the close borders induce slightly different user groups and needs to be actively taken into account.

While both CLCs are very accessible regarding opening hours with outpatient and maternity services open 24/7, these opening hours were not always clear for respondents with many varied responses. Indications that opening hours were convenient found in client exit interviews (at least 74% of participants per facility reported convenient opening hours) were sometimes contradicting in-depth interviews of the same facility. Surprisingly, the CLCs did not seem to outperform the control facilities on the percentage of users who considered the opening hours convenient, especially in Mandera where 91% of the control facility users considered opening hours convenient this was 77% in the CLC.

Waiting times for service at facility is often an important factor for facility users. Past experiences with long waiting time may lead users to pick another facility. A clearly identified obstacle to accommodate CLC users are the overall higher waiting times compared to the control facilities. Waiting times longer than 60 minutes have been reported by 48% of CLC-Githurai clients and 34% of CLC-Dandu clients, compared to 36% and 4% in their respective counterfactuals. The proportion of CLC users who considered their waiting time not reasonable was (statistically) significantly higher in CLC-Githurai (40%) compared to Kiambu-control (22%). Long waiting times at CLC-Githurai were reported by interview participants. In comparison to respondents in the household survey, about 80% (n=149) found their waiting time acceptable. On the other hand, some facility staff in Mandera mentioned acceptable waiting times. This is reflected by the respondents of the CEI in which 12% of CLC users and only 5% of counterfactual clients reported their waiting times as not reasonable. Notably, the Mandera counterfactual also had (statistically) significant lower waiting times and a larger proportion of users who considered their waiting time reasonable.

The lack of medication was mentioned in all facilities as a problem, which often incurred extra costs as users had to procure medicines from a private pharmacy or similar establishment. This was also underlined by the county representatives and Philips experts; stock-outs of medication is a national problem in Kenya that has to be addressed by the MoH.

AFFORDABILITY

Services at all facilities were free of charge. Participants accounts about the National Hospital Insurance Fund (NHIF) suggest that not everyone had NHIF, and some were unclear about how it was used. In Kiambu, respondents from the CLC referred to Linda Mama services while this was not the case for the control facility. Across all facilities, users reported indirect costs, especially transportation and medication bought outside of the facility.

While technically services are free in all locations, users experiences are different. Fees are often incurred, if not for administrative reasons, then because medication is not available at the facility. It is unclear whether hidden fees were incurred, yet the amount of money spent reported by users may suggest so.

It is important to note that the coverage of health insurance (e.g., prepayment plan) was very different between users in Kiambu county and users in Mandera county. Fifty percent of Kiambu CLC clients and 45% control-facility clients indicated in the CEI to be part of a prepayment plan while this was much lower in CLC-Dandu (7%) and control facility in Mandera (4%). Many users in Kiambu mentioned not being charged any money for services, at both the CLC (95%) and control (93%) which aligns with the fact that services in level 2 and 3 are free of charge. On the other hand, users in Mandera were more often charged for services at the CLC (22% of users) compared to the control (8% of users), despite the free services status of both facilities. We were not able to uncover the reasons for this difference.

Regarding decision-making on when and where to seek care, most respondents of the survey that expressed a need to visit services waited a week or less (80%) before going there, with the main barriers being work or financial. It is not clear whether the financial barrier was expressed for both types of services (public and private) or if it related specifically to public services or medications. Among the people who expressed a need for a visit, 41% answered they were still able to visit within one day of the perception of that need, which is a very high proportion. Again, this could involve prescription renewal or medications.

FINDINGS: UTILIZATION TRENDS

KEY FINDINGS

- General upward trends in maternal, child and reproductive care utilisation rates seen at county and sub-county levels indicates the CLCs are in sync with increasing service demand.
- Service utilisation rates beyond 100% indicate an underestimation of the catchment population (denominator) for services.
- Underestimates may have led to bottlenecks in medicines provision, posting of human resources, and generally resources allocation for the CLC, and resulted in the current reported overcrowding.
- Utilisation at CLC-Githurai shows clear upward trends since 2013 for maternal and child health (data was not available for CLC-Dandu).
- Lack of data for the health facilities surrounding the CLC prevents reaching a conclusion on whether the CLC approach had a particular effect on utilisation beyond the level of other facilities in the county.

The data used for the trends analysis was obtained from the routine Health Management Information System (DHIS2 based) and from Philips Research Africa in separate Excel file containing utilization data of CLC-Kiambu. Philips provided facility level data including total number clients for antenatal care, welfare clinic and woman receiving family planning commodities.

ARE ESSENTIAL SERVICES USED BY THE POPULATION?

Measuring utilisation of healthcare services allows estimation of how many people in a catchment area actually access and use services that are accessible and available. Initially, analysing utilisation trends intended to answer evaluation questions related to relevance, effectiveness, efficiency, and impact by comparing the added value of the CLCs to their competition environment. In other words, looking at service utilisation of the CLCs and of surrounding facilities. Incomplete coverage data on selected tracer indicators including the limited availability of client visits and coverage data per health facility did not allow to make such analysis. Instead, looking at national, county, and sub-county trends, the trend analysis provided insight on whether general services utilisation compares well to utilisation of services offered at the CLC. For this, tracer indicators related to maternal, child, and reproductive care were primarily used. Due to lack of completeness (proportion of non-missing observations per each variable, timepoint, unit of analyses), some indicators (skilled assisted births, fully immunised children under one year old) were excluded. Further details on completeness of the data at different levels can be found in Annex 5, table I to table III.

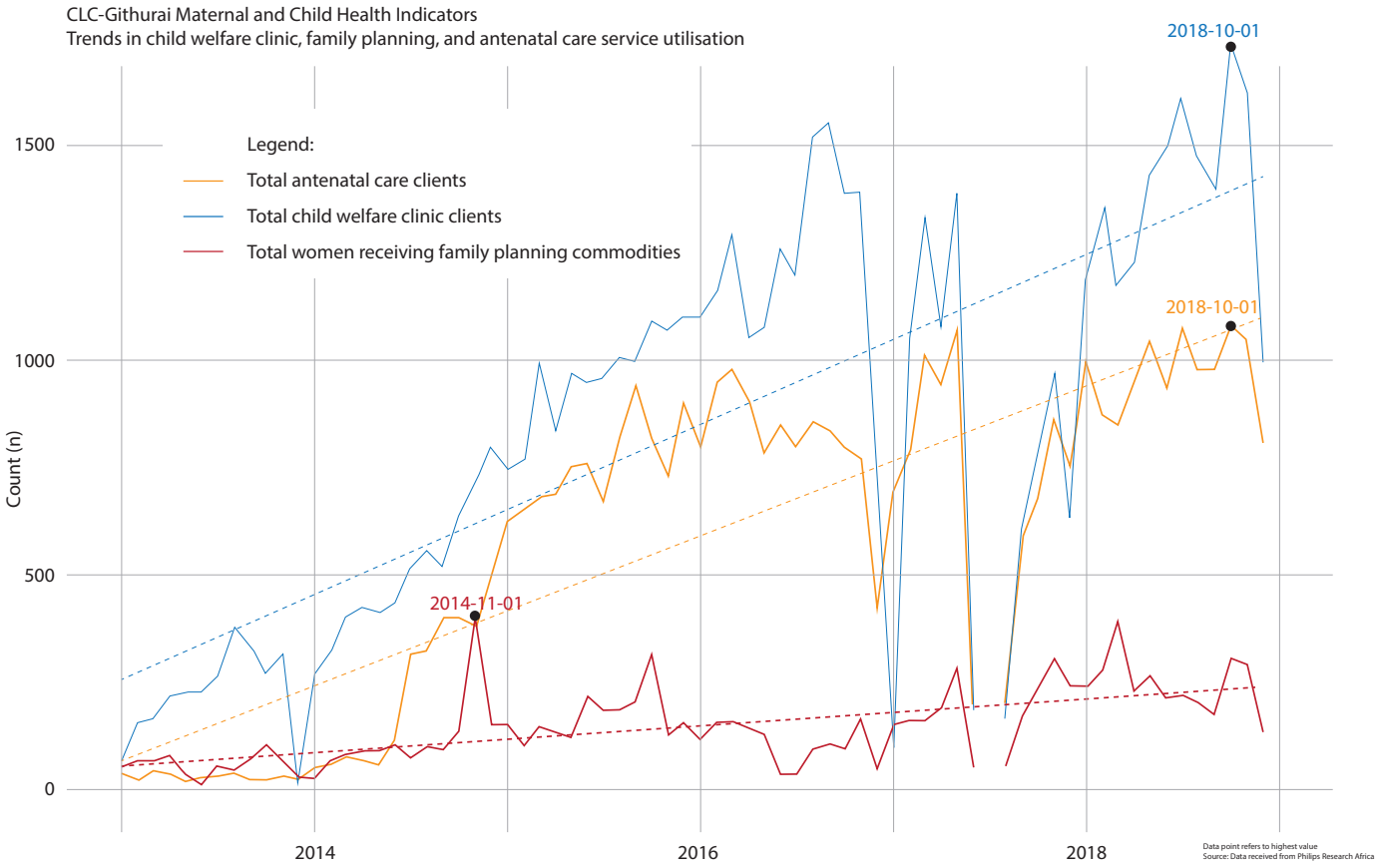


Figure 5 CLC-Githurai trends in use of services for antenatal care, child welfare clinic, and family planning

In the CLC-Githurai, there is a clear increase in service utilisation of total service usage (new and re-attendance) related to antenatal care (ANC), child welfare clinic (CWC), and family planning (FP) since 2013 (Figure 5). The number of ANC visits is constantly low until mid-2014 when it starts to steadily increase. Also, Quarter 4 2013 marks a clear and sudden drop in the utilisation of childcare services. Similar sharp drops can be observed between Quarter 2016 (November) to the point where no data is collected; these drops are probably related to nation-wide health worker strikes.[5]

In the period from 2017 to 2019 a stark improvement in service utilization is observed which could indicate a pressing demand for service. Given the wide availability of health service providers in the area, the fast growth in service utilisation during that period would indicate that many users are (quickly) attracted to the CLC. This could suggest some attraction factor. If we break down these composite maternal and childcare indicators, however, the trend can be interpreted differently. When we look at children fully immunized, skilled birth attendance, and pregnant women having completed four visits of antenatal care (ANC4) (Figure 6), we see a similar upward trend, except for the fact that utilisation after the strike periods is more slowly restabilising itself.

5. See: Health workers strikes in Kenya https://kemri-wellcome.org/zp-content/uploads/2020/08/Health-worker-strikes-in-Kenya-policy-brief___.pdf

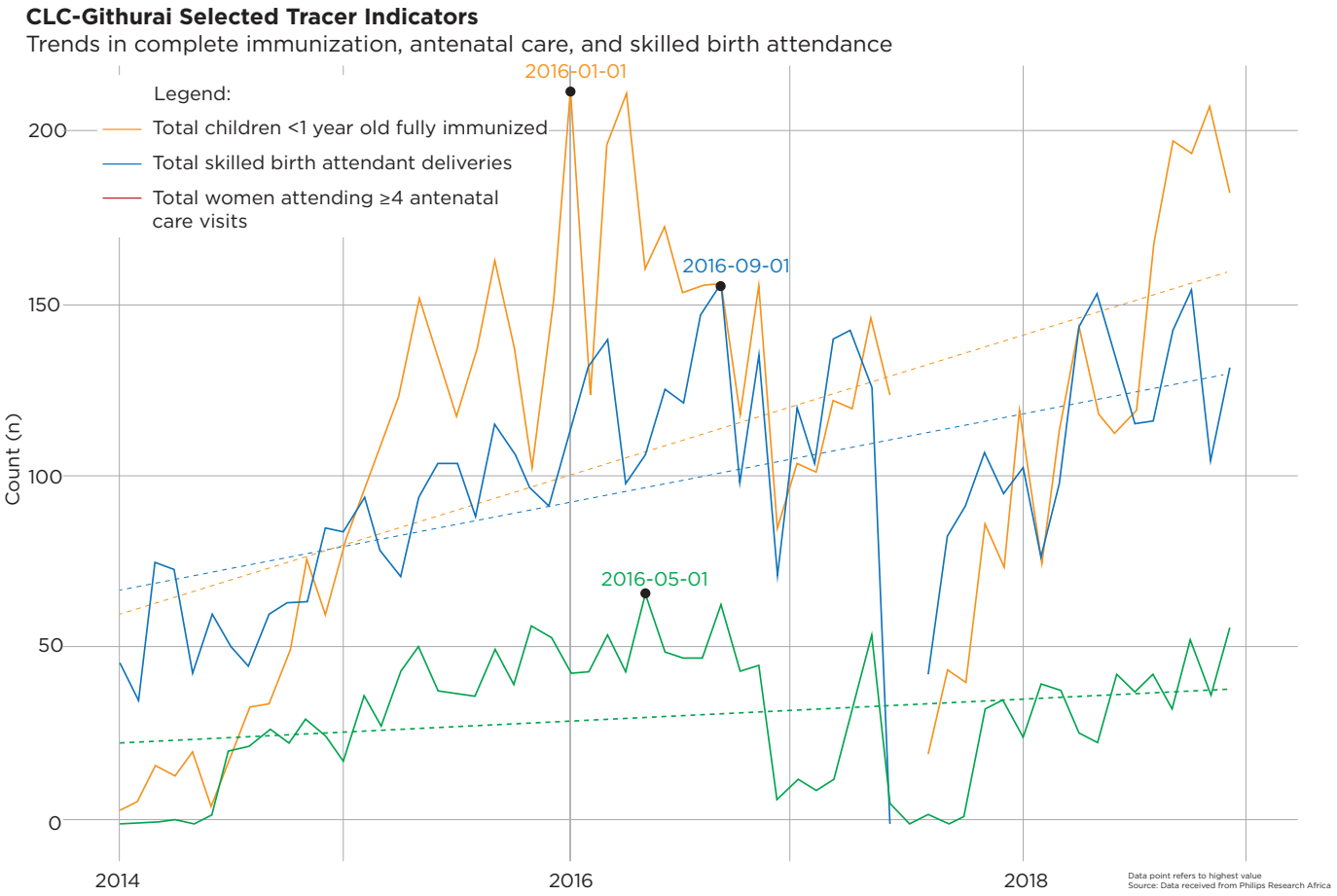


Figure 6 Utilisation trend of tracer indicators, CLC-Githurai

There is a clear, overall, increase in utilisation for each of the indicators with the peak utilisation values (black dots with dates) reached in 2016 for the three indicators in Figure 6.

When comparing the temporal trends of service utilisation at county level we observed that Kiambu county is having the fastest growth and highest absolute levels in ANC1 and ANC4 visits among other counties in ANC service utilisation rates (Figure 7). These very high rates in Kiambu (beyond 100%) can be explained by either an underestimate of the denominator (the eligible population for the respective service), or by use of services in Kiambu from people coming from neighbouring counties. This could suggest the need for more service capacity in Kiambu County, that also the CLC may have to serve a higher demand than anticipated, and that resources (human, medicines) allocated for the county are insufficient to meet the demand. The care offered at the CLC is clearly meeting an existing demand. The need is seen across the county and seemingly beyond the MoH projections. In that regard, the CLC model responds a demand for services.

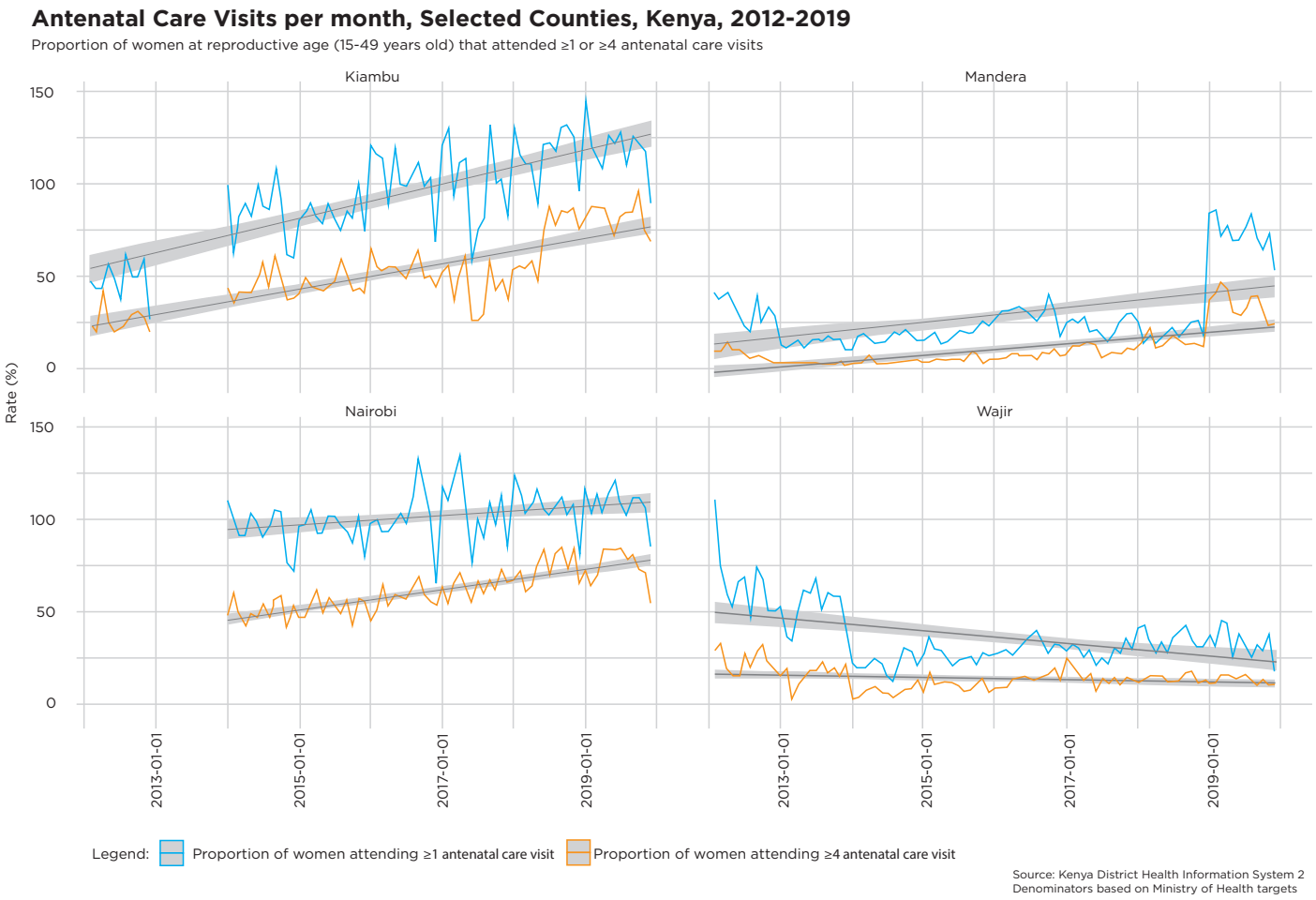


Figure 7 County level monthly ANC Rates 2012-2020

Some of the seemingly regular yearly jumps in ANC1 and ANC4 at county level (Figure 7) may be related to yearly updates of eligible population (the denominator), or to reporting procedures. A clear explanation for this pattern would need further analysis.

Expanded Programme for Immunization (EPI) indicators (Figure 8) across counties show a more stable upward trend with less yearly variation. Compared to ANC demand, where Kiambu County appears to service its own and possibly other counties' demand, the EPI indicators are more evenly distributed across counties, which may derive from the fact other free, government facilities (in other counties?) provide care for expecting mothers and children under 5.

The relative contribution of the CLCs themselves to either ANC or EPI indicators cannot be explored, however they are in sync with higher demand for services.

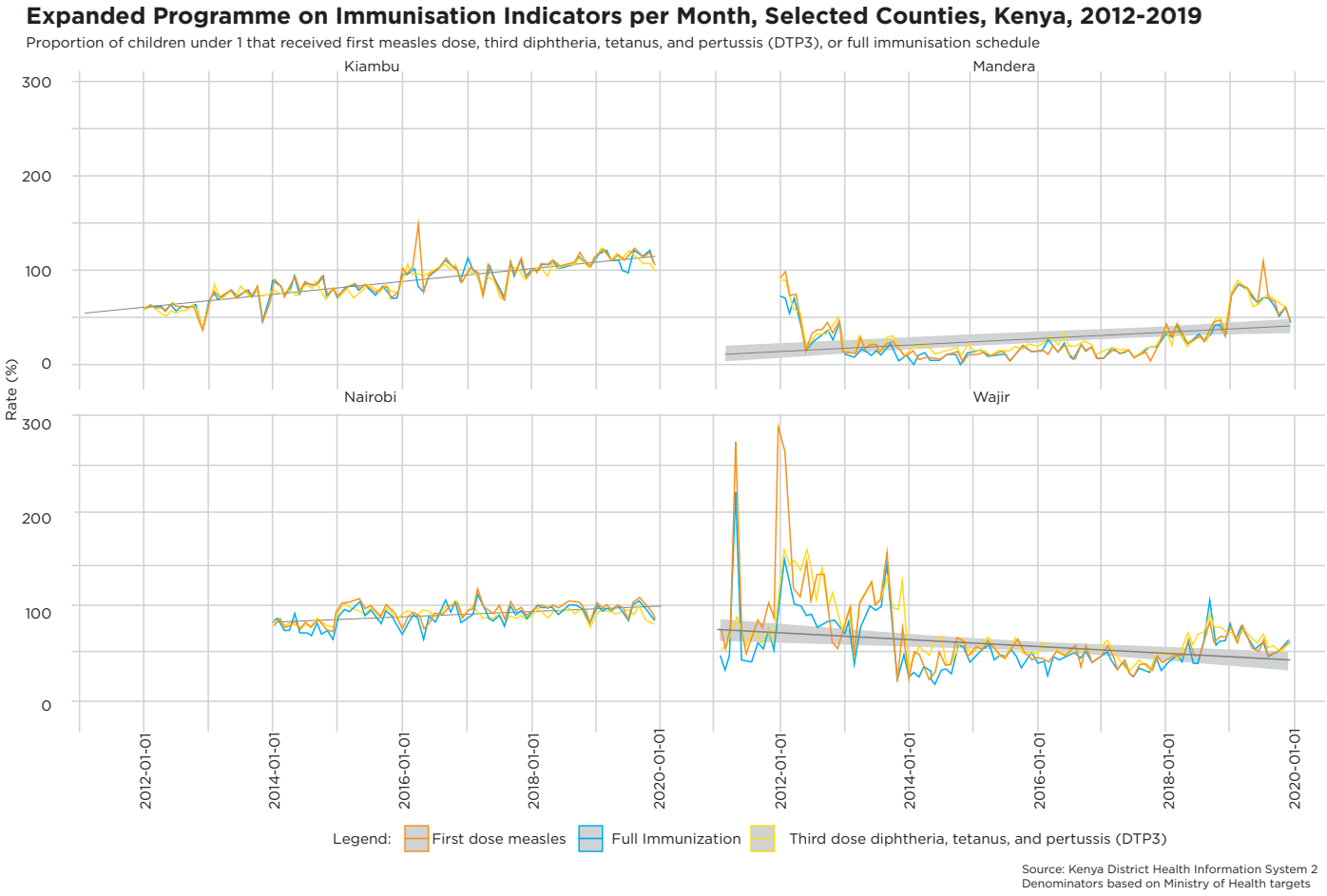


Figure 8 Monthly Expanded Programme of Immunization indicators

FINDINGS: QUALITY OF CARE

Quality of care is defined as the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. This section presents the main findings on the structural and process elements of quality of care. The assessment of the appropriateness of quality of care for these two dimensions (structural and process) is based on the triangulation of data on perceived and observed quality of care. Observed quality of care was assessed through client provider observations and facility observations. Perceived quality of care data was collected through qualitative interviews and client exit interviews.

Note: In the Levesque framework, quality of care is the last step, from utilisation of services to outcomes of service provision; the supply side is called 'appropriateness' of care, the demand side 'ability to engage' in this framework (Annex 2).

KEY FINDINGS

- There are shortages of drugs and staff in both CLCs and control facilities.
- The ultrasound machine, an important element in the CLC facilities, could not be used optimally due to dependency on the skills of one staff member in Mandera.
- Despite initial training of CHVs, a need and request for more trainings for CHVs was found in both CLCs and control facilities. Although respondents referred to the initial training initiated by Philips, continuous training is a responsibility of the county. It is unclear how the initial training of CHVs initiated by Philips was aligned with the general service package of CHVs.
- Except at CLC-Dandu, there was a shortage of space in the facilities.
- Regarding the process of care, interpersonal aspects were generally well rated, with little difference between CLCs and control centres. In terms of technical quality, that is adherence to evidence-based guidelines, small differences were observed, but the small samples do not justify any firm conclusions.
- Safety conditions for waste disposal and needles were considered appropriate in the CLCs.
- The CLCs scored lower on waiting time than the control facilities.

IS THE QUALITY OF SERVICES APPROPRIATE?

STRUCTURAL ELEMENTS

In all the facilities, CLCs and controls, essential health commodities did not seem to be available in sufficient quantities to cover the target population, as a general shortage of drugs was reported. This was also noticed during the facility-level observations: in CLC-Githurai, 34% of medications were out of stock (including 50% of family planning methods) and 22% at the control facility (including 25% of FP methods).

The shortage of drugs was the main complaint about the services highlighted by users as well as facility staff, particularly in Kiambu. In CLC-Githurai, drugs were delivered every three months and depleted in the span of a month. It was mentioned

that often only medicine for relieving symptoms (e.g., paracetamol) or cheap medicines were available and given, not the medicines that were required for the patient. When the medicines were not available, clients received a prescription to buy the medicine somewhere else. However, when referred to external pharmacies, they often preferred not to buy (all) the medicines. According to a CHV, there was no control over the price of drugs at pharmacies, so the costs were very high.

The structural elements include the availability of commodities, equipment, qualified staff, and standard guidelines as well as the appropriateness of the facility infrastructure and safety conditions.

In Mandera, although respondents indicated that medicines were sometimes available, drug stock depletion occurred prior to the end of the quarter. CLC users argued that the growing use of services by population from bordering countries contributed to drug stock depletion at facilities and pharmacies. In both Kiambu and Mandera county, CLC users who were interviewed after their consult were less satisfied (statistically significant) with the availability of medicines compare to the users of the control facilities. (Annex 3, table III)

Provision of healthcare diagnostics and laboratory equipment is included in the technology package of both CLCs. Essential equipment and diagnostics seemed to be generally available in the CLCs and control facilities, with a few exceptions. One participant stated that (HIV) testing kits and needles for immunizing were not always available at CLC-Githurai. In Kiambu, users of the CLC and control facility remarked that equipment were lacking for X-ray and cancer screening . Various participants mentioned that there was no theatre for delivery at CLC-Githurai. At CLC-Dandu, the theatre was yet to be operationalised and diagnostic equipment was noted to be sometimes missing at the CLC. In Mandera county, CLC-Dandu was equipped with a laboratory and an ultrasound machine, while this was not available in the control facility. However, participants remarked that it could not be used because only one staff member was capable of conducting ultrasounds. If this person was not available, the service was not provided. One oxygen machine was not functioning.

> “So, because of the equipment provided at the CLC by Philips and the county government I think the facility is superior and the locals are appreciating, and we are utilizing the services.” (KII, Health Authority)

There were no perceived differences in workload between the CLCs and the control facilities While specific services are open 24/7, the findings indicate a shortage of staff in both CLCs and control facilities. In Kiambu, health providers from the CLC and the control facility had a very high workload.

6. Secondary level equipment. Relates to users expectations. This would also depend on national health policies, and the specific cancer for which screening is applied.

"Yes, because the workload and the number of staff cannot compare as you know, it is supposed to run for twenty-four hours, and we have only one clinical officer that is a point to note, meaning he will be working day and night. So, the number of staff is not sufficient for instance when the lab tech is home for his leave it means the lab will not run, so those are the breakups it happens the same to the radiologist and the pharm tech" (KII, Facility management, Dandu)

In Mandera, female participants from the CLC and control facility expressed the need for female doctors and female nurses. In the words of a participant:

"What we seriously need is a female doctor because here the women are shy of being served by a male doctor during delivery. What we really need, and our number one demand is a female doctor. They even don't tell their health problems to these male doctors even if they have it because they are shy of them. Our main demand is for a female nurse." (KII, health centre committee, Burduras)

Provision of training is offered by Philips at the time of the installation of the CLC. The CLCs did not outperform the control facilities in terms of trainings of staff or their skills. Continuous training is the responsibility of the County. In CLC-Githurai, most key informants argued the skills of the staff were okay in the CLC. Only one informant of the health centre committee said more expertise and profession was needed. Trainings for staff were available, although one village elder said doctors for gynaecological services were sometimes not fully trained.

In Mandera, it is unclear from the collected data if facility staff received enough training. A health authority said that there were refresher trainings based on the priorities of the county or the department. Staff of the CLC and control facility said trainings were given but not frequently (either quarterly or yearly). A nutritionist said the trainings were given once a year.

Although refresher trainings of CHVs was another CLC component, continuous training and supervision is not available in CLCs and counterfactuals, the need for more trainings for CHVs was found across all areas. In Kiambu, CHVs had received trainings in 2012 and 2015 from Philips, and some received trainings from sponsors. One CHV mentioned that she lacked updated knowledge needed to do her work. Health authorities acknowledged the limited trainings for CHVs.

"One thing about the community strategy it was well initiated, but as we go ahead, it is not being supported, like you a community health worker was trained, ten years ago, is still has the same skill up to now, you know we need updates." (KII, public health officer, CLC)

In Mandera, CHVs (and facility staff) had received occasional trainings by Save the Children and argued that there were no more trainings, the last one was in 2017. It was reported that CHVs had initially received training by Philips but no training afterwards. Often CHVs expressed they wanted more trainings:

"I would like trainings of CHV to be conducted because people forget their responsibilities and the link between the community and the facility will be broken." (KII, Community Health Volunteer, CLC)

In terms of infrastructure, all facilities except CLC-Dandu were reported by respondents to have a shortage of space, with services being given in the same room because of the lack of space.

In CLC-Githurai, participants expressed the need for separating the area for maternal and child health and curative services. Blood pressure tests were done close to the area for delivery, there was not enough waiting room, the rooms were congested, the population visiting the CLC kept increasing, services were given in the same area while they were not supposed to be integrated together, and there was no space to differentiate between male and female clients. It was also mentioned that the outpatient area was overstretched. In the client exit interviews, respondents were generally happy with the privacy.

A CHV said that people did not like the location of the CCC room, because it was a stand-alone room separate from the rest. Hence, people could assume that the people who went to the CCC had HIV or TB. The CHV also mentioned that people did not like to come out of the consultation room after hearing they were tested positive for HIV.

On the contrary, the infrastructure in CLC-Dandu was considered adequate for the delivery of services. It was highlighted that the infrastructure had become better because in the past the space was not well organized. The key departments had rooms for their service provision, the lab had been renovated and organized (it was in separate rooms before), the original room for staff was now the delivery room, and there were offices for staff to meet and have discussions.

The lack of privacy in CLC-Dandu's maternity ward was highlighted by one key informant. As the patient admission and maternity ward were co-located, accident victims arriving via ambulance joined women in the maternity ward. Moreover, this informant mentioned that there were no separate wards for male and female clients. However, from the CEI the satisfaction on privacy during consultation was high (average score 4.6 out of 5).

Safety conditions for waste disposal and needles were highlighted as appropriate in CLC-Githurai, including water, handwashing and other hygiene, incinerators, safety boxes, equipment for sterilizers and for safe disposal of waste in every room, disposal containers for needles, and disposal containers at the outpatient, lab, CCC, and maternity. There were more negative comments about the waste disposal system in Gachororo, such as no incinerator. This finding is supported by the facility observation in which standard precautions for infection prevention were not observed in Gachororo while being observed in CLC-Githurai.

In Mandera, the safety conditions for waste disposal and needles were considered appropriate for both CLC and control facility.

The findings suggest that there can be underuse of medicines across facilities due to the general shortage of drugs. Rather than the prescription of medicines, the shortage derived from being able to find and buy the prescribed medicines.

The process elements include the prescription of medicines, emergencies screening, integration of services and waiting time for consultations.

At CLC-Githurai, one traditional birth assistant mentioned that the staff would only prescribe medicine to people who were from that area. Therefore, some people lied about where they reside because otherwise, they would not be given drugs.

It was noted that clients seemed to trust government facilities more than pharmacies to get the right medicines, to quote:

> "People like to go to government hospitals because they write for you prescriptions even if you will go to buy it; it will be the correct medicine because the doctor who is here is somebody who is professionally qualified. So, people have that courage that when they come here, they will be prescribed for medicine that will help them get well." (KII, village elder, CLC)

Arrangements for emergency screening were in place in all facilities: in both the CLCs and the control facilities there was a system of triage and all conducted emergency screening aiming to provide timeliness of care. In CLC-Dandu, triage and arrangements for screening of emergencies were in place. It was noted that at CLC-Dandu there was a nurse available 24/7 who can respond in emergencies.

CLC-Dandu's staff seemed to be closely connected to the community; in cases of emergency, the community members called the staff directly. It was mentioned that CHVs in Dandu helped in following up on emergencies. The referral limitations due to the lack of a standby ambulance was seen as an obstacle to timely response to emergencies in all areas. These common challenges across the CLC and control facility exist because both facilities are dependent on calling the ambulance from its parent hospital. In Kiambu, a provider at the Githurai CLC even highlighted that this was the main weakness of the CLC.

> "Emergencies are the most challenging thing in this facility. I think that is where we have the weakest part of this facility; as the referral system is extremely poor." (KII facility staff Githurai)

In Kiambu and Mandera, services were reported as integrated and appropriate in the CLC and the control facility. In CLC-Githurai, the integrated approach on selected chronic conditions stood out compared to the control (checking blood pressure, cholesterol level, urine for glucose), while in the control facility, nutritional and physical activity counselling were considered better integrated in service provision.
A health authority mentioned that services for pregnant women were not comprehensive at the control facility, referring to the lack of equipment, lack of staff, limited opening hours, and lack of essential medicines. An interviewed staff member of

the control facility mentioned there was no integration of services for the outpatient department. A CLC health authority in Mandera mentioned that some services were integrated because of the limited number of healthcare workers.

CLC clients were less satisfied with the waiting time before consultation compared to clients of the control facilities. Among the 135 CLC-Dandu clients, the waiting time was at least one hour for 34% of the respondents compared to only 4% of the 127 Burduras clients. Compared to Kiambu county, where, across the CLC and control facility, few clients considered their waiting time reasonable, the percentage of users waiting at least an hour was again higher for CLC clients compared to counterfactual (12% vs 5%: statistically significant difference). (Annex 3, table II) In Kiambu, several key informants noted that many people did not have the time to queue. Long waiting times were also reported by interviewed users of CLC-Githurai and the control facility in Kiambu. In CLC-Githurai it was reported that the waiting time was less for family planning, while in the control facility, waiting time was perceived to be longer for Outpatient Department (OPD) and CCC and less for nutrition services.

In Kiambu, service providers acknowledged the long waiting times, while in Mandera, key informants of CLC-Dandu (facility staff, CHV) reported the waiting time as acceptable except when there was a training, and less staff were available for specific services. Key informants of the counterfactual (facility staff, CHV) indicated that the waiting time was sometimes long.

> “One thing I know they are aware that the workload is high, so when they come, they already are psychologically prepared to queue.” (KII, nursing service manager, CLC)

Overall, clients were satisfied with the behaviour of health professionals in both CLCs and control facilities. The average score on the composite index reflecting behaviour of staff (including separate scores on the friendliness of staff, friendliness of provider, and perceived ability to discuss problems regarding the health issue) varied from 4.1 (CLC-Dandu) to 4.6 (Gachororo) out of a maximum score of 5. (Annex 3, table III) This quantitative finding from the CEIs was supported by the qualitative information. In Kiambu, particularly among users of the control facility, various participants argued that student/young providers could be rude. The time providers took to listen and explain was something that participants highlighted as being better in private facilities.7 Overall, young, and adult women participants were satisfied with CHVs’ attitudes/roles. For example, they were positive on how CHVs provided counselling.

Observation of generic aspects of attitude, communication, and empathy skills showed overall high levels of rapport building in CLCs and control facilities. While more privacy was observed in CLC-Githurai, in Gachororo the providers took sufficient time and discussed the follow-up more frequently compared to CLC-Githurai. Regarding the

7. In Kiambu, given the wider availability of alternative providers, including private ones, respondents often compared with such private providers.

technical parts for the ‘under 5 clinic’ and ‘family planning’, Gachororo seemed to perform better: it was observed that the providers more frequently verified the clients’ understanding and inquired about questions and worries, including recording growth and discussing it. Furthermore, explanation was provided about different FP methods and providers asked about clients’ questions, experiences, and concerns. In Mandera, only one consultation was observed per facility which limited the comparability. CLC-Dandu scored remarkably lower compared to Burduras. Lack of privacy was also confirmed by respondents of the qualitative interviews but during the client exit interviews only 1 (0.8%) respondent (Burduras) indicated to be dissatisfied with the privacy during the consultation (Annex 3, table IV).

FINDINGS: APPROPRIATENESS OF SUPPORT AND MANAGEMENT FUNCTIONS

KEY FINDINGS

- As the studied CLCs are owned by the County Governments, the management responsibilities, including accountability relations (financial and reporting of activities for the DHIS2), social accountability (consultations and feedback arrangements with the community), supply systems and human resources processes are the same as in other primary care facilities.
- CLC-Githurai was the only facility with an Electronic Medical Record System in place although it was unclear from the study data to what extent it was used and whether and how it had an influence on the quality of care.
- The difficulties in accessing an ambulance on time was a clear challenge for the CLCs and control facilities to respond to emergencies, especially in Kiambu. The referral system of the CLC in Githurai was considered weak, as populations may have had unrealistic expectations with regard to the availability of ambulance services.
- The key findings on human resources and supply systems presented under the previous chapter on quality of care, namely the shortage of drugs and staff and the limited continuous trainings for CHVs, are also part of the management functions of primary care facilities. Management functions influence quality of care.

IS THE MANAGEMENT OF THE CLCs APPROPRIATELY FUNCTIONING?

CLCs ownership relies on the county government, similar to other primary care facilities. Facility staff from both CLCs as well as health authorities explained that the County Governments had a memorandum of understanding (MOU) with Philips, which in the case of CLC-Dandu also included the UNFPA. This MOU did not make any difference in the management at the facility level, the management, and financial responsibilities of the CLCs were the same as other primary care facilities.

The ultimate financial responsibility of the CLCs relies on the county government, who disburse funds to the facility, approves the budgets and signs the financial transactions of the CLCs as any other primary healthcare facility. At the facility level, a facility management committee is responsible for ensuring appropriate operations of the facility. The following quote from a health authority from Mandera details this two-level management.

> "We have two kinds of management in the facility. One is the oversight management that is the facility committee with the Chairman, Treasurer and the Secretary who is also the facility in-charge. Then we have the facility management that is from the government aspect where we have the in-charge and departmental heads of the facility; so they are efficient in terms of the funds utilization. Funds requisitions are normally made, and all priorities are being made by all the staff and it is going to be approved or recommended by the committee which determines whether the priorities was right or not right. So far it is efficient because we didn't have any problems." (KII, County Director Mandera)

The CLCs and counterfactual facilities are accountable to the Sub-County and County health management teams. All facilities have regular accountability mechanisms in place such as monthly financial reports, DHIS data, and quarterly meetings with sub-county and county health management teams. Each month the facilities send health records to the sub county (health records information office) which then sends it to the county level who input it into DHIS2. This is the formal route for financial and DHIS2 information. Upon analysing data from the DHIS2, from 2013 onwards, monthly completeness of data increased from less than 33% to 100% for TB- and HIV-related indicators and women attending four or more ANC visits in both CLC-Githurai as well as Gachororo. Data on indicators 'proportion of woman attending at least one or four or more ANC visits', proportion of skilled birth attendants, estimated deliveries and pregnant woman, childhood vaccinations, were missing until 2019. Despite missing facility level data, county level data was more complete.

In terms of social accountability or community engagement, the arrangements were also similar between the CLCs and the control facilities. Facility staff from the CLC and from the control facility in Kiambu, and health authorities in Mandera stated that there were community representatives in the facility board.

> "The facility health committee is an oversight body that normally represents the community. They are normally elected or selected by the community to represent them on the matter that hold the facility accountable. Secondly the county assembly that also oversees the facility especially at the word level that is the county assembly member of a respective ward, and then the ward administrators. All these people make the facility accountable. So generally, we have the county assembly at the ministry level and at the community level we have the health facility committee that make their facility accountable." (KII, health Authority, Mandera)

Suggestion boxes or dialogue days organized by CHVs were other periodic mechanisms across the facilities to engage the community.

> "We have a CU (community unit) in the facility, and through the community action days and dialogue days, they are able to discuss about the facility and maybe identify any major challenges that they usually face when accessing services in other facilities. Those are venues that are used to account to the community and even identify the challenges they face so that it can be solved amicably through the community and also the staff manning the facility." (KII, Facility staff, CLC-Dandu)

Digital data systems, as one of the specific components of the CLC concept, are only in place in CLC-Githurai which has an electronic medical record (EMR) system while all the registers were manual and paper-based for CLC-Dandu and the two counterfactual facilities. While most interviewed staff from CLC-Githurai argued that the EMR was used across departments, two informants also referred to manual registrations and one of which even argued that records were now kept manually again, after the computers had been stolen.

"We have two kinds of management in the facility. One is the oversight management that is the facility committee with the Chairman, Treasurer and the Secretary who is also the facility in-charge. Then we have the facility management that is from the government aspect where we have the in-charge and departmental heads of the facility; so they are efficient in terms of the funds utilization. Funds requisitions are normally made, and all priorities are being made by all the staff and it is going to be approved or recommended by the committee which determines whether the priorities was right or not right. So far it is efficient because we didn't have any problems." (KII, County Director Mandera)

Human resources processes are also led by the county government and are therefore similar at the CLCs and counterfactual facilities. Most of the staff is employed by the County government and the training and supervision of staff is regularly done by the Sub-County and County health authorities (e.g., performance reviews). CHVs are also supervised by (sub) county health authorities, as well as by community health extension workers (CHEW) to whom they report.

CHVs referring patients to the CLC is an envisioned CLC pathway. In relation to the referral practices, a respondent of the CLC-Githurai facility staff said the system between the facility and the CHV was not working well, because patients referred to the CLC by CHVs had to queue like other patients. Patients had to bring back a booklet from referrals to the CHV after they have seen a provider in the CLC, but that did not necessarily happen.

In Mandera, the referral practices seemed to be facing less challenges than in Kiambu. CHVs pointed out the lack of vehicles to respond to pregnancy and delivery complications emergencies. However, a few key informants stated that an ambulance was located at the CLC to facilitate the referrals.

"We have an ambulance located at the CLC to facilitate the referrals. And in case of an obstetric emergency the ambulance is always on stand-by, and it can be referred to the next referral facility where caesarean section can be done before the theatre is operationalized." (RH Health authority Mandera)

"If they are manageable here, we manage them, but if they need the theatre, we refer to the sub-County Hospital, and we have an ambulance. Referral system so far is okay" (KII, facility management, Dandu)

Across all the facilities, the CLCs as well as the control facilities interacted with a broad range of stakeholders for the management with no major differences between the CLCs and the control facilities. In Kiambu, the facilities interacted with a larger variety of stakeholders than in Mandera. Annex 6 Collaboration partners provides an overview of the mentioned stakeholders.

DISCUSSION AND CONCLUSIONS

This chapter aims to synthesize the findings from the earlier chapters and to discuss a few critical issues related to the CLC model of primary care provision. We have chosen to focus on issues we have determined are important for Philips to reflect upon in their further promotion of the CLC concept and platform.

We begin with a short introduction on the defining elements of the CLC: what are the unique selling points of a CLC.

Next we discuss how these defining elements fit into a theory of change for health systems, building on the preliminary theory of change (ToC) that was developed together with Philips officials, and described in the report of Webster & Hanson(8).

- In the first subsection, we refer to two frameworks from the literature that the proposed ToC is based on, particularly the one that focuses specifically on primary care. We also discuss shortly how we define outcomes and impacts based on ToC and these frameworks.
- The second subsection makes a few cautionary observations to take into account when applying such general health systems frameworks to a small sample of primary care facilities, which constitute only a subset of a health system, and that operate in a specific country and local context.
- The third subsection summarizes the main conclusions with regard to outcomes and impacts that we consider plausible given the observations in the previous subsection.
- The final subsection discusses how each of the defining elements or features of the CLC relate to these outcomes and impacts

The third section presents a summary of the non-health related contributions of the CLC model, as they also appear in the theory of change: commercial strategy and product sales, and influences on community living conditions.

The final sections present the strengths and weaknesses of the study, and some final conclusions. The main findings and recommendations are summarized in the executive summary and therefore not repeated in this chapter.

WHAT DEFINES A CLC AND THEIR DISTINGUISHING FEATURES?

First a reflection on the defining features of the CLC model in Kenya. What makes a CLC different from other (public) primary care facilities? In the Kenyan context, the CLCs remain part of the publicly owned and financed health system. Two interrelated reasons underlie the importance of this reflection on the defining features of the CLC model:

1. Clarifying the defining features of the CLC model constitute the starting point for understanding how they relate to their desired outcomes or impacts.
2. Understanding the defining features of the CLC model also pertains to understanding how it can be profiled as a viable primary care model, both from a stance of corporate social responsibility, as well as a proof-of-concept for using technological innovations in primary healthcare delivery in an appropriate manner.

From our study and from the CLC documentation the following can be considered "defining features" of the CLC-platform:

A. The co-creation process, with the partnerships and engagement with various stakeholders
B. Technical innovations & equipment
   - EMR
   - Ultrasound
   - Community volunteer backpacks
   - Solar power
   - Water supply technologies
C. Specific arrangements for human resources, including the CHVs: training, other human resources management arrangements.
D. Management arrangements and organizational practices, including referral systems
E. Infrastructural investments
   - Waste management installations
   - Infrastructure (or its refurbishment or expansion) and furniture: fixed and mobile.

THEORY OF CHANGE: PRELIMINARY REFLECTIONS ON HOW THE DEFINING ELEMENTS OF THE CLC MIGHT INFLUENCE ITS OUTCOMES AND IMPACT.

In this section, we will start by comparing the common frameworks for evaluation of health systems, particularly primary care, and how they align with the Theory of Change framework of Webster & Hanson. Then we will make a few cautionary observations to take into account when applying such general health systems frameworks to a small sample of primary care facilities, which constitute only a subset of a health system, and that operate in a specific country and local context. Given these considerations, we summarize the main conclusions on the outcomes and impacts of the current study and discuss how the defining features are linked to these outcomes and impacts.

OUTCOMES AND IMPACTS IN THEORY OF CHANGE AND RELATED EVALUATION FRAMEWORKS

A ToC is a logical and linear framework that outlines steps in a change process from inputs, through to outputs, outcomes, and impacts. Thus, when trying to assess effectiveness, we are assessing the realised outcomes and impacts compared to intended/desired outcomes and impacts.

In the whole discussion on effectiveness (impacts and outcomes), it is important to look at the pathways towards these outcomes and impacts. So, before the discussion on outcomes and impacts (page 71), we shortly introduce the relevant frameworks here, including the ToC developed by Webster and Hanson (Figure 9), that was informed by these frameworks.

At a health systems level, the most commonly and generally agreed framework for monitoring and evaluation is the generic framework from IHP+ (15) (See Annex 7). This is also the framework for the Global Reference List of 100 Core Health Indicators, including the health-related SDGs.(16) The Primary Healthcare Performance Initiative (PHCPI) conceptual framework (17) (See Annex 7.) has been developed on the basis of this generic framework, specifying the service delivery part in terms of the specific characteristics and functions of Primary (Health) Care (18).[8]

As stated in the Webster and Hanson report, the theory of change for the Philips CLC platform was developed after a series of interviews with Philips and County staff and validated during a ToC workshop with Philips and county staff (8). The bottom part of this ToC refers to the commercial strategy and collateral activities pursued in connection to the CLCs to improve the living conditions of people living in the vicinity of CLCs. These aspects have no corresponding section in the IHP+ and PHCPI frameworks, and although they were not within the main scope of this evaluation, these non-health related outcomes are discussed in following section (page 78).

At the level of outcomes, two dimensions are distinguished in both IHP+ and PHCPI frameworks: the effective coverage of service provision; and the extent to which health behaviours and health risk factors change in a favourable way. In the IHP+ framework, this is reflected by the outcome of 'prevalence of risk behaviours and factors', that can be affected by behaviour change interventions, and intersectoral action on wider determinants of health. The primary care level can have an important role in such health promotion activities, but a large share of such activities and interventions fall beyond their scope. In the PHCPI framework, this outcome is covered by the first item of 'health promotion' under Effective service coverage. Webster & Hanson do not explicitly mention this health promotion element of PHC under the outcomes of their ToC. Nor do they use the concept of effective coverage, but instead use a cluster of quality of care; utilization; efficiency; and referral system optimization.

8. It should be noted that the Outcomes and Impact levels of the IHP+ framework correspond to the Outputs and Outcomes levels of the PHCPI framework. Unfortunately, these concepts are not always used consistently across literature. In this report, we will follow the more common terminology of the IHP+ framework.

At the level of impacts, health systems are usually evaluated along the three fundamental goals of health systems: improved health status, as measured by indicators of morbidity and mortality; responsiveness to needs of the populations served, a concept closely related to satisfaction with services provided and the extent to which perceived needs of the populations are being addressed; and thirdly the extent to which health systems protect people from the financial consequences of ill health. Improved health status and responsiveness are captured in both the IHP+ and the PHCPI frameworks. The financial protection component is not covered in the outcome/impact part of the PHCPI framework; the framework covers this concept under Financial Coverage (A2c) and Financial Access (C3a). In the ToC for the CLC, Webster & Hanson do not mention responsiveness under outcomes or impacts, although it may be implicit as a dimension of quality of care. There is also no explicit mention of financial protection in their ToC.

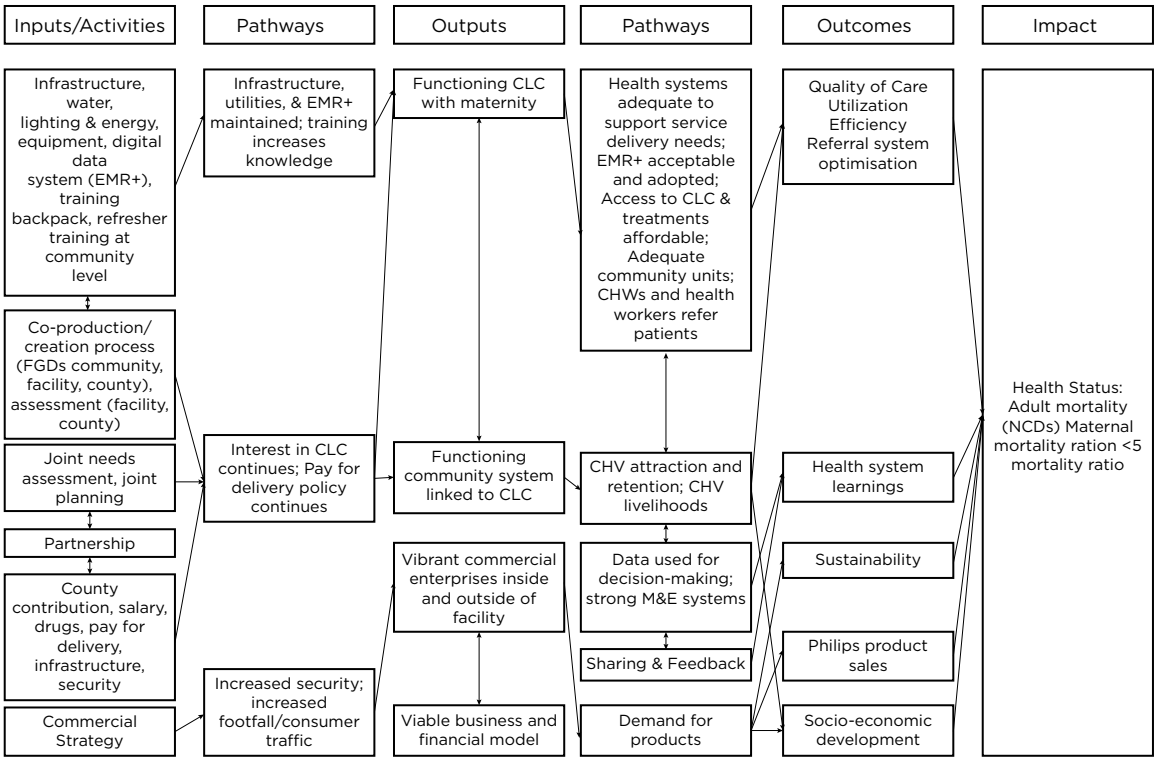


Figure 9 Community Life Center Theory of Change by Webster and Hanson (8)

REFLECTIONS WITH REGARD TO THE INTERPRETATION OF OUTCOMES AND IMPACTS IN THIS EVALUATION

Many of the outcome and impact dimensions (whether looking at the ToC, or the IHP+ or PHCPI frameworks on which the ToC was based) apply to health systems as a whole, at aggregate level, and not to one level of healthcare provision in isolation, let alone a small sample of primary care institutions. Conclusions on outcomes and impacts for a particular model of primary care provision, that is the CLC, is therefore a priori hazardous.

Looking at these frameworks and reflecting on effectiveness (or outcomes and impacts), two considerations should be made:

Country context and health system level: Many of the influencing factors for outcomes and even more for impacts (note that in the PHCPI framework these are called outputs and outcomes respectively, while the outputs in the Webster & Hanson ToC are among the service delivery elements of the PHCPI framework) are beyond the control of the CLC platform as such.

Primary care centres operate in a country context, with its sociocultural and economic determinants that influence health status more than health services in a more strict sense (19,20). Additionally, primary care centres function in a local and national health system, again with factors like its overall financing level and arrangements (tax based or insurance, level of financing), its supply systems, staff allocations; etc. Considering all these influencing factors, both at society level and at health system level, and comparing these to the factors that make up the CLC specific inputs and activities of the ToC, the CLC specific elements may not be expected to have the largest influence on the (local) health system, or even at the facility level itself: Certainly not for health impacts, but even not that big at the outcomes level of the ToC.

Facility level factors: this evaluation has looked at two CLCs, each with one public facility in its vicinity as a control facility. In such a small sample, there are other circumstantial factors that are at play at the level of the primary care facility itself. One dynamic, inspiring, or friendly head of a centre, or midwife can for instance make a difference in attendance rates. Another example are other stakeholders (NGOs, CSO, donors, etc.) that are involved in a county or in a primary care facility; we saw quite a large number of them in both CLCs, a bit more in Githurai than in Dandu. Their interventions or efforts are another confounder in the performance of respective primary care facility. It is likely that the number of NGOs and donors involved is higher in Githurai than in Dandu just because of the closeness to Nairobi.

That is why we should not be too focused on whether there were quantitative differences in attendance, quality, etc. between CLCs and counterfactuals, or between the CLC in Githurai and Dandu. Interpretation of differences, or of trends becomes hazardous, when taking all the possible confounders into account. We should be more concerned about qualitative elements of how and why things worked or did not seem to work.

A number of these context and facility level factors can be different when a CLC has a different ownership status: NGO/private-non-for-profit/private for profit; or under a different public-private arrangement. Currently, at least in the Kenyan situation, Philips has a formal or informal agreement with county authorities, and the involvement of Philips has been most pronounced in the initial phase of co-creation, training, and investments; the impression is that involvement of Philips is much less in the follow-up phase, probably only receiving information for research purposes. This means that the largest part of the input factors (funding for staff and medicines, supervision system, treatment protocols and guidelines, activity packages for CHVs, reporting models and requirements, etc.) are not different for CLC and control facilities, as both fall under the same county health authorities.

A final remark is that we should also be aware that the defining elements and technological innovations have or can have a perceived value, either from the perspective of users of services, or the staff engaged in activities; and a "true" value, in the sense of contributing directly to health outcomes and impacts, responsiveness, financial protection and efficiency or value for money. For instance, technologies such as an ultrasound (at primary care level) can be incredibly attractive and appealing for pregnant women, but how and to what extent does it contribute to addressing emergency obstetric care and lowering maternal mortality ratios. The two sides are not unrelated, as appeal for technologies from the side of users or staff can promote attendance of users, and motivation of staff.

SUMMARY OF FINDINGS ON OUTCOMES AND IMPACTS

In this section, we summarize the main findings on outcomes and impacts, keeping in mind the considerations given above, and following the definitions of outcomes and impacts discussed in section the first subsection (page 68), that correspond to our main evaluation questions and research table (see Annex 1a and 1b, respectively). Although the concept of effective coverage is not explicitly mentioned in the preliminary ToC, the dimensions in its box (Quality of Care; Utilisation; Efficiency; and Referral system optimization) are in fact reflected in the integrated concept of effective coverage.

Contribution of the CLC on effective coverage of services and on the health status of populations served

Effective coverage of services is a concept that relates healthcare needs, use of services and quality of care: it is the proportion of professionally defined needs (that are not the same as the perceived needs) that is satisfied, or that actually receives the care needed with sufficient quality to be effective. At the health systems level, and across all interventions, it measures the fraction of the potential health gains that a health system could be expected to deliver. In the SDGs, this effective coverage is reported through an indicator called the Universal Health Coverage Service Coverage Index (UHC SCI), that is composed of 16 tracer indicators.

Measuring effective coverage is a challenge, at national and at international level(21). At the level of a few individual facilities, it is even more challenging to estimate, let alone quantify, the contribution that each facility makes to effective coverage and UHC: first of all, catchment population, for which a facility is responsible, are mostly not precisely known; second, the burden of health needs is not exactly known in quantitative terms (intrinsic needs are derived from the catchment population size; incidental needs depend on the local epidemiological situation); third, the DHIS2 does not necessarily provide reliable information on all the conditions that have been attended to (e.g. incorrect diagnosis); and fourth, information about quality of care in the sense of knowing to what extent the care provided to each individual client contributed to the potential health gain that might be expected from it, is even more illusory at the level of the individual than it is at aggregate, country level.

However, we can say whether it is plausible that a CLC at least contributes to effective coverage, and whether it even contributes comparatively better than other primary

care facilities, when we analyse the trends in utilisation of services, in time and in comparison, to other facilities; and when we analyse whether the quality of care provided in the CLCs may be expected to bring the health gains that could potentially be expected from the intervention delivered.

Our study clearly showed part of the increase in utilisation rates seems to be a more general trend in Kenya, but there are reasons to assume that people show some preference for the CLCs. For quality of care, we cannot be too sure, and the aspects of quality that are particularly appreciated, concern mostly perceived quality and inter-relational aspects of care. The technical aspects of quality of care for the most common prevailing health problems, and the extent to which these led to any health gains, cannot easily be quantified. In fact, such analyses could only be done reliably at the country level, and provided the country would dispose of more sophisticated information systems on causes of death and disability (22,23).

Although at the level of a few individual facilities, it is challenging to estimate, let alone quantify, the contribution that each facility makes to effective coverage and universal health coverage, it is plausible to state that the CLCs have contributed to effective coverage, both through an increase in utilisation of services, and an improved (perceived) quality of care. From the small sample of consultation observations, we could not draw firm conclusions on the level of technical quality, or on difference between CLCs and control facilities.

How satisfied are people with the CLC services and how responsive were the CLCs to the perceived needs of the population?

The results show that in both facilities in Kiambu and Mandera the quality of care was perceived as satisfactory and satisfaction levels were generally high for all indicators in all facilities. Negative remarks about the CLC were about the availability of medicine, shortage of doctors and the waiting time. In both facilities, clients were satisfied with the behaviour of staff in terms of communication. Both facilities scored high on patient centeredness, but no important differences were observed with the control facilities. Waiting time were definitely longer in CLCs compared to control facilities, but this might also be related at least in part to a relatively higher workload due to increased utilisation.

Overall, the CLCs were responsive in meeting the perceived health needs of the targeted populations in both Kiambu and Mandera. The target population reported that they felt that the priority areas which they highlighted during the design stage of the CLCs had been generally met. The installation of a maternity ward was a key priority which was particularly emphasised by both the Githurai and Dandu areas and which the two CLCs addressed. In Kiambu, participants of the CLC and Gachororo mentioned that they did not have to travel far to seek for health services.
The maternity wards in the CLCs were able to provide services which were not previously available prior to their installation. Services such as first-time delivery support and ultrasound services were highlighted by respondents in Kiambu and Mandera respectively as services which were of huge added value and resulted in pregnant women in the area seeking care at the CLCs.

Financial protection

Currently, there are no user fees at public facilities of primary care level in Kenya. Services are paid mainly from subsidies from national and county level. Thus, the CLC as a public facility (in Kenya) offers services 'for free'. However, as has been explained earlier in this report, supply of essential medicines does not match the increasing demand, and in such cases, patients are referred to private pharmacies, where costs can be prohibitive. Another problem posed by these 'free' services is queuing, as has been demonstrated by the long(er) waiting times. For some specific services, there exist special universal insurance schemes, notably the Linda Mama scheme that covers maternal care.

Indirectly, the CLCs focus on neglected and poor populations, as evidenced by strategic locations. An example is Dandu, in Mandera county, where an extremely high maternal mortality ratio has been reported: 3795/100,000 live births (24). Dandu is also attracting Somali and Ethiopian populations who otherwise wouldn't have access to healthcare. Likewise, the CLC in Githurai Lang'ata is generally attracting poorer population groups.

There are no CLC specific provisions or arrangements to subsidize medicines or other treatments for poor people where they would not already be for free. In the survey, some people did report costs for services, but it is not clear whether these concerns 'informal' payments, travel costs or costs related to prescription when medicines were not available at the health centre. Users in Dandu CLC reported payments more often than the control facility, whereas services are supposed to be free.

In conclusion, the question whether the CLCs contribute more or less to the financial protection for costs of needed services in comparison to other public services is impossible to answer on the basis of this study; the choice for the location of CLCs in more neglected suburbs or regions may suggest a pro-poor orientation, but the CLCs do not have specific and formal arrangements for access of the poor, other than protection schemes in the context of the NHIF (25), such as the Linda Mama Free maternity scheme, or the Health Insurance Subsidy for the Poor (HISP) scheme.

DISCUSSION ON EACH OF THE CRITICAL/DEFINING ELEMENTS OF THE CLC

In this section, we discuss how and to what extent the defining elements of the CLC link to outcomes and impacts, through inputs, various pathways, and outputs, as exemplified in the preliminary ToC proposed by Webster & Hanson.
9.2.4.1. The co-creation process, partnerships, and collaboration with various stakeholders (A)

The co-creation constitutes an important element in the CLC approach, laying a foundation for the further collaboration between partners, and not only creating a baseline for the health needs of the catchment population, but also as a start of creating trust between a primary care facility and its catchment population. Unfortunately, Kenya so far does not have a system of empanelment, whereby citizens subscribe or choose a preferred primary care provider. In Kiambu, there was a tendency for people to return to the same primary care facility, slightly more for

the CLC than for the counterfactual, but in general people shop around, based on their complaints, earlier experience, perceived cost, and perceived quality for specific services.

The co-creation process was broadly involving public authorities, potential partners, and the target populations at the initial stages of the CLC. Beyond the initial process, Philips kept involved, through getting data to help the facility in visualization and use of data, and through contacts with county health authorities, and partner organizations about the functioning of the CLCs. We found no signs for a more continuous formal engagement and dialogue with community representatives on community health needs and on community perceptions on the service provision of the CLCs.

While the co-creation process constituted a good participative approach for the identification of local priorities for specific Philips funded interventions and investments, Philips should look into how this approach reinforces or constrains the specificity and visibility of the CLC platform. If Philips wants the CLC platform to be recognisable and wants to profile this as a model for primary care delivery, then certain elements should be a required minimum.

What would be essential elements of a memorandum of understanding with public authorities to guarantee such a specificity and profile of the CLC platform? What would be the role of Philips beyond an initial investment phase, and does Philips want to have such a co-management role? And if not, how does this change the typical CLC approach or model that Philips wishes to profile itself with?

We saw that people and staff alike may have certain expectations once a CLC has a profile of benefiting from Philips' support. Staff and users alike may have expectations for services that do not conform to the essential package of services assigned to primary care institutions. How to manage public expectations within this co-creation and co-management setup?

TECHNOLOGICAL INNOVATIONS AND EQUIPMENT: HARDWARE VERSUS SOFTWARE (B)

A first question to ask concerning the choice of hardware, or technological innovations: are they congruent with the roles and mandates of the levels where they are used (primary care level; community level: e.g., backpack).

Once they are chosen and selected, questions arise about their maintenance, repair if needed; and their proper utilization, more particularly the skills training for staff using them.

In order to benefit fully and sustainably from technological inputs and/or innovations, it is obvious that continuous support and refresher training would be necessary. The question is then what the role of Philips would be to guarantee such support and complementary measures in a context of public ownership of the primary care facilities. Such support or software would consist of training, procedures and guidelines, refreshers, recurrent expenditures. While hardware innovations can be potentially extremely useful and promising in the further development of primary care,

their effectiveness may be challenged by deficiencies in the software.

EMR: Electronic Medical Record systems constitute an important and potentially very useful innovation in primary care settings. They can serve a dual purpose: reporting on services provided, and so linking them to monthly reporting systems for DHIS2; and individual patient management and follow-up. Follow-up for patients is important for any disease, but particularly for chronic care provision, like in the case of TB, HIV, and for the increasingly prevalent non-communicable diseases. Besides, as the level of primary care is also concerned with continuity of care across the lifecycle of individuals and patients, the EMR looks like an excellent tool for innovations in primary care.

The EMR has been implemented in CLC-Githurai, not in CLC-Dandu. Besides, not all staff were familiar with its use, and many preferred paper-based forms. Problems indicated were stolen computers, and the associated workload to keep the system up to date. When implemented in isolated health facilities, it will be a challenge to harmonize systems with national information and reporting requirements, and to get new staff acquainted with the system, given the rather frequent staff mutations. Currently, the system seems to be underexploited, due to operational challenges related to training, adjustments to local context and national information system requirements, etc. With appropriate operational research that combines the hardware and software needs for an EMR system, far more potential could be gained from this innovation. Such research should address both the use and harmonization of the EMR system with DHIS2 reporting requirements, and its potential use for patient management, particularly for chronic diseases, follow-up for EPI and ANC programs, etc. One could think of linkages with m-health warnings for follow-up visits, or adherence to treatment measures.

CHV Backpacks: A question arising from this evaluation is whether this backpack, whose content includes equipment that are rather Philips-specific, is used next to other tools and supplies to fulfil the entire community service package. (26). If this is not the case, then a question would be whether the contents of the backpack is leading to the kind of activities that CHVs give priority or whether the contents has effectively been composed based on the priorities of that service package.

A further issue is the planning of the backpacks, in terms of quantity needed, and in terms of maintenance, follow-up training and monitoring of its use, substituting of consumption items and supplies. CHVs everywhere show rather high attrition rates, and the result of all these operational challenges is that an innovation, that is very good in design, is over time not giving the results and potential that could otherwise be expected. An example is the blood pressure measurement: to what extent is the application of this technology used as a screening for high blood pressure in isolation, or integrated into a more comprehensive non-communicable disease screening that looks at other risk factors like BMI, smoking behaviour, cholesterol.(27). What becomes of patients being screened and identified with this technology? How is the further management of hypertension and NCDs in general organized at the CLC level itself in short, how is such a technology embedded in a comprehensive and integrated NCD screening and management approach.

Technologies introduced need validation for the context, and the skills profile of the CHVs using them.

The pulse oximetry is a promising technique, but its use by CHVs would still require close monitoring in experimental situations in a community integrated management of childhood illness approach. This is an area were added value in terms of technological innovation could be evident.

Ultrasound: This equipment was available in both Kiambu and Dandu. People and county managers appreciated the existence of this technology, and it was associated with improved perceived quality of care. There was a constraint in the sense that only one staff member could operate the equipment. Normally ultrasound would not be part of the equipment at primary care level, but Dandu might be an exception, as it is at large distance from a referral hospital, and there was also a theatre foreseen in the centre, but that was not (yet) operational. For primary care and usual antenatal care, a Doppler equipment would be sufficient; image ultrasound would fit more in a hospital setting, complementary to other emergency obstetric care interventions like blood transfusion and caesarean section.

HUMAN RESOURCES ARRANGEMENTS, INCLUDING FOR CHVS (C)

In the CLC approach, one element is the initial and continuous training of staff of the CLC and of CHVs. Training is covering the use of equipment and tools, and according to the CLC brochures, there is also training on a variety of other topics, like clinical training, facility management training, training on data collection and monitoring, management of patient flows and referrals. From interviews and reports we have found that training in Dandu has been through the intermediary of Amref, and targeted CHVs, in the initial phase in 2017. Any supervision or training that has taken place more recently is undertaken by the county authorities. In Dandu, supervision of CHVs was done in the past, but not currently.

All other human resources management practices are not CLC-specific and conform to public service practices; in that sense, there is no difference with any other public primary care facility.

The same is true for other management and support systems, like supply systems for essential drugs, transport arrangements for referrals, reporting and accountability systems and procedures, and social accountability arrangements that follow the Kenyan community health policy.

MANAGEMENT & ORGANIZATIONAL ARRANGEMENTS, INCLUDING REFERRAL PRACTICES (D)

Most of the management and organizational arrangements are not CLC-specific. In the brochures about the CLC concept, management issues are part of the training modules for the CLC, but we have not been able to see either these modules, or the results of these training efforts in the two CLCs that were object of this evaluation.

Referral practices have two parts: referral from CHVs and community to the CLC;

and referral for secondary care from the CLC to district hospitals. Regarding the first, the referral (in health systems jargon, CHVs are more seen as 'facilitators' or as an 'interface' of care seeking for community members to the primary care level) from community to CLC, we did not find much evidence for this in Kiambu, and given the favourable accessibility of primary care, this could hardly be expected. In rural Dandu, this effect could be expected to be larger, because of both physical and 'cultural' distance between community members and primary care facility. However, problems with supervision and follow-up of CHVs, and also problems with the supplies and harmonization of the contents of backpacks with community health policies affected the potential benefit that might have been derived from this strategy.

The referral from CLC to (district) hospital appeared to be problematic, people complaining about of lack of transport or ambulances. The question is whether an ambulance is one of the essential elements of the CLC concept, and besides, even the investment in an ambulance needs to be supported by appropriate management and support measures, to keep an ambulance functional. If an ambulance is not part of the CLC concept, or depends on the co-creation process, proper expectation management would be needed. Procedures for referral between CLC and referral hospital were not CLC-specific, but are known to be problematic in many LMICs, with dysfunctional systems of 'gate-keeping' and in practice no clear distinction in package of services and roles of primary care facilities and hospitals.

INFRASTRUCTURAL INVESTMENTS (E)

Water supply systems, lighting through solar panels, and waste disposal systems, together with the physical infrastructure refurbishments certainly make a positive contribution to the image of the CLCs.

In the comparison of these elements to the control facilities we found a consistent advantage for the CLCs, and where water or electricity were available in the control facilities, more problems or interruptions were reported. Whether such differences will be sustainable, would depend again on the extent of continuous involvement of Philips with these CLCs, and the type of agreement with the government on issues of maintenance.

In any case, all these elements help in the structural quality, or the state of service readiness of the CLCs, and they contribute to the outside image of the CLC and their attractiveness for the population or potential users of services. Besides, they also contribute to the security of the premises, and to the operation of the business hubs, that didn't constitute the focus of this evaluation, but that are shortly discussed in the next section.

HOW HAS THE CLC CHANGED THE COMMUNITY LIVING CONDITIONS?

INCREASED ACCESSIBILITY OF WATER

The availability of water as a result of the CLC differs greatly between Kiambu and Mandera. In Kiambu, respondents were able to highlight the ways in which water provided by the CLC had an impact on the community living conditions. While one respondent explained that the increased accessibility to water has *"lightened them* (the locals) *economically, they used to walk distance looking for water."* (KII, public health officer, CLC), another respondent shared that *"the growth of this area is as a result of water and solar supply"* (KII, Community Health Volunteer, CLC). It was mentioned that there was an adequate supply of water which had reduced costs and that people had enough money to pay for it. In Gachororo, a public borehole was built preceding the hospital. Respondents shared that in the past, availability of water had been a problem but that the facility helped with providing clean water to the community. While many respondents were positive about the water supply, a village elder in Kiambu said the water provided by Philips was being treated and as a result it was salty, which affected the bones of the locals. In Mandera, it was explained that the facility at neither Dandu nor Burduras had enough water supply to positively impact community living conditions. However, it was mentioned that people who lived near the facility had benefitted. It was also mentioned in the FGD that despite the shortages, people had received free water during the dry spell upon requesting it.

INCREASED SAFETY AND SECURITY

The presence of the CLCs has increased safety and security in the CLC and surrounding areas which has positively impacted community living conditions. This increase in safety and security can mostly be attributed to better lighting in the area surrounding the CLC as well water provision. The extent to which electricity impacted community living differed between the different areas. In Mandera, the solar panels in the CLC played a vital role in ensuring access to 24-hour care in the facility but the opinions on whether this availability of electricity impacted community living conditions were contradictory. One religious leader noted that there was availability of power to the community but in Burduras, a respondent shared that *"As for the solar whoever has the capability connects personally and those without stay without. There is no solar sufficient for the whole town. Maybe charging of phones for those who are near."* (FGD, women 20-49, Burduras).

Meanwhile, in Kiambu, a respondent shared that *"Before this facility was started this area was dark but now it is bright."* (KII, traditional birth assistant, Githurai). It was highlighted that there were lights available at the CLC, streetlights and floodlights. Although the streetlights were installed by the county, some did not function due to lack of maintenance. However, it was mentioned that now the lights are always on due to the solar system, even when there was an electricity blackout. It was often highlighted that improved lighting in the area contributed to the safety in Githurai. Thanks to the presence of the CLC, more businesses were operating and felt more confident in staying open late because the area was more secure. It was noted that the streetlights installed around the CLC made the street a business street and

reduced the amount of fear that people felt. Furthermore, also in Githurai, a participant highlighted that in the past the area used to be insecure. "Bad" people (*'ratas'*) had been controlling the area and they had destabilised homeowners. However, the improvement of lighting and security in the area had contributed to its improvement. A chief mentioned the CLC had also improved the social life of the community.

Electricity was also available for the community in Gachororo, and it was mentioned that there were floodlights there too but the issue of safety was still reported as a problem in Gachororo. The facility itself did not operate during the night due to lack of strong security measures and presumably this has had an effect of the perceived level of security in the area. One respondent shared that *"That is one of our biggest challenges here because you cannot operate at night when you know you are not secure."* (KII, facility staff, Gachororo).

INCREASED ECONOMIC ACTIVITY

The installation of the CLCs spurred an increase in economic activities in both Kiambu and Mandera. In Kiambu, it was reported that there was an influx of people coming to the CLC and that this caused commercial activities, partly intentioned, spin-off to grow. Originally the CLC concept implied commercial activities within the compounds of the CLC but this was not realized. Outside CLC-Githurai compound there was increase commercial activity and expansion of living quarters. People who owned rental houses started to receive higher rents from tenants because people had started to move to the area to be closer to healthcare services and new houses were also built to cater for those moving to the area to be near the new development. It was argued that water and solar supply resulted in growth of the area in Githurai.

A growth in a number of economic activities were mentioned in Githurai. Businesses were opening and benefitting from the CLC. People who visited the CLC would buy food and drinks. The opening up of small businesses such as chemists, labs, kiosks, markets, shops (e.g., selling bananas, table covers, snacks), "motorbike guys", "BodaBoda people" and TukTuk driver were all reported. It was mentioned that there was a bus stop and vehicles around the facility and a hotel was also mentioned. An informant of a faith-based organisation mentioned that before the CLC was there, there was nothing in that area. Since the installation of the CLC, there have been employment and income opportunities for people in the facility and shops around the facility. It was mentioned that there also was more employment of people in the health profession.

In relation to health and the improvement in economic activities, one respondent in Githurai shared that people could now use money for other means because of the facility, in the words of the respondent: *"It has helped us because now people can save money instead of using all their income on seeking healthcare because now people can come and get free medical services, the common people have really benefited."* (KII, village elder, Githurai) Furthermore, it was also highlighted that since the health of the local population in Githurai has improved that people are able to work better which was also contributed to economic improvement.

In Mandera, some businesses had emerged, and kiosks were opened near the CLC. The in-charge of Dandu highlighted businesses would become "booming" because of patients coming to the CLC, in the words of the informant:

> "You see, when the clients are many, they use means to come to the hospital, they will have the meals eaten at our canters. The businesses will become booming because of the patient's influx from other places as far as 50 km from the CLC who come here to secure services. There are those who might spend and use the facility amenities." (KII, In-Charge Dandu, CLC)

However, a health authority mentioned that not all small-scale business at the facility managed to survive. It was also noted that agreements of the CLC were not met, it was a five-year plan, but it did not last for five years. There were supposed to be farms near the dam so that people in the community could farm and help themselves. A CHV noted that they were told small rooms would be constructed for them to use and run a kiosk for themselves. However, that had not happened and the CHV did not know why it had not been done. Moreover, a CHV mentioned that they were told that people interested in initiating a business could make "power connections" from the CLC. The owner of the kiosk at the main gate and "the plot neighbouring the facility" requested management of the facility and they were allowed to access the management in their homes.

In Burduras, it was highlighted that people who had been jobless now worked as casuals and earned wages. It was also noted that the commercial activities in Burduras had increased because patients used a motorcycle to come to and leave the facility. A nutritionist of the CLC thought the facility had not brought any economic effect in the community since the services would only benefit the facility.

STUDY STRENGTHS AND LIMITATIONS

Strengths

- The mixed study design, allowing for triangulation.
- Broadly agreed upon protocol and approved by multiple ethical review boards including the Research Ethics of KIT Royal Tropical Institute, the Internal Committee Biomedical Experiments (ICBE) of Philips Company, Amref Ethics and Scientific Review Committee Kenya.
- We received willing support from CLC-related stakeholders, reflecting a lot of goodwill in relation to this CLC platform. This also included the continued support from Philips Research Africa
- Study findings based on two CLCs with their respective control facilities, with many local (at facility level: staff characteristics; presence of other intervening stakeholders) and contextual factors (urban, rural; country and health system context), making attribution to any particular intervention – and particularly the CLC specific interventions - quite challenging. Despite these challenges the evaluation has contributed to valuable insights into innovative primary care models.
- A similar evaluation is currently being analysed in South Africa, lessons learned from these country evaluations will be described in a separate synthesis report and support the future development of the CLC concept and its Theory of Change.

- Lessons learned from this evaluation methodology have the potential to improve and tailor the generic evaluation protocol to other CLC sites.

Weaknesses & Limitations

- Long delays in the study implementation, amongst others due to three different procedures for research ethics approval.
- Although the local research coordinator was selected after a careful selection procedure which also included references checking at Philips Research Africa, UMC Radboud and Measure Evaluation the local coordinator did not deliver as contractually agreed. Regretfully KIT had no other choice to terminate his contract which affected several steps in the research including i) lack of detailed field data collection report ii) recruitment of KIT interns to support coding of transcripts within the available financial resources; iii) lack of local input during data analyses workshop (which we aimed to overcome by having a student from Agha Khan University Nairobi taking part in the data analyses workshop and having two researchers from Philips Research Africa being available for contextual support and reviewing the draft report to contribute with contextual input were needed).
- KIT research team not having been directly involved ("immerged") in particularly qualitative interviews and visits, getting most information indirectly through transcripts.
- KIT team had no access to level of agreements between Philips, the CLCs, county and national authorities which made it difficult for us to discern roles and responsibilities with regard to the CLC.
- As discussed, the level of evidence is rather low, given the many confounding factors in play, and the small size of the study (covering two CLCs and respective control facilities).
- The study did not retrieve detailed information on appropriateness of support and management functions therefore our findings are less providing assessments of how they are functioning.
- The "value for money" for the CLC concept and approaches could not yet be assessed within our study due to insufficient knowledge on detailed CLC investment and recurrent costs.

CONCLUSIONS

- The discussion around the CLC platform as an innovative model of primary care delivery, and a reflection to make even better use of its potential benefits, is more than opportune and strategic. Focusing on PHC/Primary care is important and opportune; in 2018 there was the celebration of the 40th year birthday of the Alma Ata declaration, and in connection to that the international health community reiterated its commitment to the principles and relevance of primary healthcare. In the last few years, several reports have been published on the challenges around quality of care in LMICs. In all these discussion and global policy forums, the primacy of PHC has been reconfirmed and PHC has been called the centre piece for the achievement of the SDGs and UHC.

- The Theory of Change developed by Webster & Hanson does not sufficiently put the CLC (and Philips) specific interventions into a broader national health system and country context. The extent to which in itself rational interventions and innovations may be expected to lead to certain outcomes and impacts is then confounded in many ways, and attribution – either in positive or negative directions – becomes hazardous in these circumstances. In addition, firm quantitative conclusions could not be anticipated based on an evaluation that just comprised a limited number of CLCs.
- CLCs receive a lot of appreciation, and there are definite signs of an attraction to the services they provide beyond the level of counterfactuals, both in terms of attendance (utilization of services) and in certain aspects of perceived quality.
- There is certainly a place for technological innovations in primary care, and, although not yet part of the CLC concept, also for consumer health applications that can link to primary care, for instance in the context of healthy behaviours in connection to the rising burden of NCDs, and in terms of continuity of care and compliance in the case of a burden of disease that is more and more modifying towards chronic diseases.
- Emphasis on hardware with much less emphasis on software, that are responsible for a lack of sustainability and potential benefits that might otherwise accrue from in itself very valuable innovations. The link between hardware and investments on the one hand; and software (continuous training, management arrangements, maintenance, and monitoring of interventions with appropriate follow-up) needs to be strengthened. In the "Tooling, Training & Tracking", the right balance is currently missing, and this may be an issue of ownership status of the facility and division of roles and responsibilities between the partners involved. The ownership and co-management arrangements may take different forms, depending on the country context, and the role that both Philips and other potential partners, wish to have. However, from the point of view of Philips, we believe that proper profiling of the CLC platform needs to be guaranteed in the process of this co-creation, for the reasons indicated in the beginning of this discussion chapter: corporate social responsibility and/or marketing of medical and consumer health technologies.
- With regard to technological innovations, proper harmonization should be guaranteed with national health policies, and with the roles assigned to different levels of care: the community platform; primary care institutions, and the various referral levels (from district to specialized hospitals). Health authorities in benefiting countries are, just like many consumers, easily attracted and seduced by technological innovations and gadgets, while paying less attention to the public interest, systems thinking and sustainability. Essential technological innovations can and need to help in the profiling ('marketing') of the CLC platform and need to be accompanied by operational research in order to look into their rationale, effectiveness, and sustainability. However, there could be a place for technologies and innovations that are not normally foreseen for a certain level of care – either the community platform, or the primary care level – according to national policies and guidelines, provided they are introduced and applied in experimental or pilot experiences.

REFERENCES

1. Chukwuemeka A. Umeh. Challenges toward achieving universal health coverage in Ghana, Kenya, Nigeria, and Tanzania. Int J Health Plann Manage. 2018;
2. Organization for Economic Co-Operation and Development (OECD). Principles for Evaluation of Development Assistance. Development Assistance Committee (DAC). Paris; 1991.
3. Philips Africa Innovation hub. The Community Life Center A community-driven and holistic platform for strengthening primary healthcare. [Internet]. 2017 [cited 2021 Apr 14]. Available from: https://images.philips.com/is/content/PhilipsConsumer/Campaigns/CA20150326_CO_001/CA20172102_CO_001-AAA-en_AA-Community-Life-Center-brochure-feb-22-2017.pdf
4. Philips. Expanding access to care [Internet]. Expanding access to care. 2021. Available from: https://www.philips.com/a-w/about/sustainability/access-to-care#_read
5. County Government of Kiambu. County Integrated Development Plan (2018-2022). 2018.
6. Philips. Philips inaugurates Africa's first Community Life Center [Internet]. Philips inaugurates Africa's first Community Life Center. 3014. Available from: https://www.philips.co.za/a-w/about/news/archive/healthcare/news/press/2014/2014-10-03_Philips-inaugurates-Africas-first-Community-Life-Center-aimed-at-strengthening-primary-health-care-and-enabling-community-development.html
7. Mandera County Government. Mandera County Integrated Development Plan (2018-2022). 2018.
8. Webster J, Hansen K. Assessment of CLC Platform, Githurai-Langata Clinic, Kiambu County, Kenya. June 2017.
9. Hone T, Macinko J, Millett C. Revisiting Alma-Ata: what is the role of primary health care in achieving the Sustainable Development Goals? The Lancet. 2018;392(10156):1461–72.
10. World Health Organization (WHO); UNICEF. A Vision for Primary Health Care in the 21St Century. 2018;
11. Alba S, Verdonck K, Lenglet A, Rumisha SF, Wienia M, Teunissen I, et al. Bridging research integrity and global health epidemiology (BRIDGE) statement: guidelines for good epidemiological practice. 2020;1–10.
12. Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2020.
13. Levesque JF, Harris MF, Russell G. Patient-centred access to health care: Conceptualising access at the interface of health systems and populations. Int J Equity Health. 2013;
14. Richard L, Furler J, Densley K, Haggerty J, Russell G, Levesque JF, et al. Equity of access to primary healthcare for vulnerable populations: The IMPACT international online survey of innovations. Int J Equity Health. 2016;15(1).
15. O'Neill K, Viswanathan K, Celades E, Boerma T. Monitoring, evaluation and review of national health strategies. Strateg Natl Health 21st Century Handb. 2016;39.
16. WHO. 2018 Global Reference List of 100 Core Health Indicators (plus health-related SDGs). 2018.
17. Ratcliffe HL, Schwarz D, Hirschhorn LR, Cejas C, Diallo A, Elorrio EG, et al. PHC Progression Model: A novel mixed-methods tool for measuring primary health care system capacity. BMJ Glob Health. 2019;4(5).
18. WHO P. From measurement to improvement: a roadmap. Primary Health Care Improvement Global Stakeholder Meeting, April 2016. In 2016. p. 25.

19. CSDH. Closing the gap in a generation : health equity through action on the social determinants of health : final report of the commission on social determinants of health. 2008.
20. Bishai DM, Cohen R, Alfonso YN, Adam T, Kuruvilla S, Schweitzer J. Factors Contributing to Maternal and Child Mortality Reductions in 146 Low- and Middle-Income Countries between 1990 and 2010. PLoS ONE. 2016;11(1):1–13.
21. Hogan DR, Stevens GA, Hosseinpoor AR, Boerma T. Monitoring universal health coverage within the Sustainable Development Goals: development and baseline data for an index of essential health services. Lancet Glob Health. 2018;6(2):e152–68.
22. Fullman N, Yearwood J, Abay SM, Abbafati C, Abd-Allah F, Abdela J, et al. Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: A systematic analysis from the Global Burden of Disease Study 2016. The Lancet. 2018;391(10136):2236–71.
23. Lozano R, Fullman N, Mumford JE, Knight M, Barthelemy CM, Abbafati C, et al. Measuring universal health coverage based on an index of effective coverage of health services in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. The Lancet. 2020;396(10258):1250–84.
24. AFIDEP. Reproductive, Maternal, Neonatal and Child Health. Mandera County. Fact Sheet June 2017. 2017.
25. Mbau R, Kabia E, Honda A, Hanson K, Barasa E. Examining purchasing reforms towards universal health coverage by the National Hospital Insurance Fund in Kenya. Int J Equity Health. 2020;19(1):1–18.
26. MOH. Community Health Policy 2020 - 2030. 2020.
27. World Health Organization (WHO). Implementation tools Package of Essential Non-communicable disease interventions. Geneva World Health Organ. 2013;210.

ANNEXES

ANNEX 1A RESEARCH TABLE

General Objective: to generate evidence regarding the impact of CLC on access and utilization of primary care services in Kenya

Specific Objectives	Issues	Methods	Respondents/ participants
1. To assess the relevance of the services offered through the CLCs.	Most common health problems in the county/catchment area of CLC (information on burden of disease). Services provided by whom (CLC, CHW), how (including stakeholder engagement) and how often? Equity (e.g., relevance of the services for specific population groups- women of reproductive age, children, and adolescents and the poorest) Services, tools, diagnostics, medicines provided and used by CLCs and CHW (including backpack) in agreement with policies and priorities for level three health facility? (See also the issue of overprovision under objective 4) Responsiveness to the needs, context, and priorities of the targeted populations How have the CLC specific needs assessment been conducted?	• Document review and re-analysis (Demographic health survey (DHS), Health Policies and Plans, local studies) • Key Informant Interviews (KIIs) • Focus Group Discussion (FGDs)	• KIIs: Health authorities, facility staff, community representatives • FGDs with (young) women living in the catchment area of the CLCs

2. To assess healthcare seeking behaviours (barriers, preferences, and responsiveness to needs) within the catchment population of selected CLCs.	Perceived health needs by community members Approachability of the CLCs for the local community Information given on CLC services provided, including outreach by CHWs Community awareness of CLCs Community trust in the CLCs Community experience with the services provided at CLCs/by CHW Acceptability of the CLCs and the services provided for the community • Community views on services that should be available • Perceived Gender/age/attitude of providers by clients • Community perception on the quality of services. • Preference for specific type of provider, in general and/or in relation to specific problems. • Reputation of the CLC Affordability of the services provided at the CLC for the population • Perceived cost of services. • Financial protection of population for catastrophic expenditure related to health seeking behaviour in the community • Fees, out of pocket payment (OOP), insurance arrangements, exemption policies, income/assets. • Direct costs, indirect costs. (in relation to income/assets) Geographic and administrative access to the CLCs • Location of the facility • Opening hours and appointment mechanisms. • Transport facilities • Peoples mobility to reach facility • Decision making on individuals to seek care	• Household Survey • IDIs • FGD • KIIs • Document review	• Household survey: Local community around CLC • IDIs with women and men of reproductive age (15-10 and 20-49 years), and household decision makers • FGDs with (young) women living in the catchment area of the CLCs • KII with facility staff and community representatives • CLC and counterfactual facility

3. To assess trends in health care utilization in the CLCs emphasizing reproductive, maternal, neonatal and child health services, and including both services provided at the facility as well as outreach activities initiated from the facility.	• Trends in utilization of tracer indicators for family planning (FP), antenatal care (ANC), reproductive, maternal, newborn and child health (RCMH), Comprehensive Care Unit (CCC), Outpatient Department (OPD) • Contribution to effective coverage of essential services • Reasons/services for first use of the CLC ('contact coverage') • Continuity of care ('adequate coverage') • Trends in utilization of the outreach activities and services provided by CHWs	• Facility level registries (extraction from monthly reports) • DHIS2 • Document review • Client exit interviews	• Client Exit Interviews with CLC clients and Counterfactual clients
4. To evaluate perceived and realized quality of health care provided to the population in the CLCs.	• Availability of medicines, equipment, supplies, • Available qualified staff • Type and formal training for staff • Adequacy of infrastructure (privacy, waiting room, sanitation facilities) • Availability of treatment/guidelines/ registers and alignment with national policies for level three facilities • Availability of registers and standard formats • Timeless and completeness of reporting • EMR services implementation and support • Arrangements and procedures in place to ensure patients safety • Underuse of effective care/Overuse of unnecessary care (Extent of overprovision of care in relation to equipment supplied at CLC level or for the CHW backpack; examples: ultrasound, X-ray, colposcope, oxygen saturation; common overprovision in terms of irrational use of medicines: INRUD indicators) • Timeliness of care: provisions of emergencies • Integration of care • Perceptions on the interpersonal aspects of care (empathic relationship, confidentiality, trust) • Client satisfaction with care provided	• Facility level observation using standardized tools • Facility level data collection using standardized tools • KII • Client Exit interviews • FGDs	• KII with facility staff, • Client Exit interviews with CLC clients and counterfactual • FGDs with (young) women living in the catchment area of the CLCs • KII with county health authorities (to cover timeliness and completeness of reporting)

5. To assess the appropriateness, of support and management functions of the CLCs.	• Facility management • Decision making processes • Use of data/M&E for decision making • Initiatives for continuous quality improvement • Upward and downward accountability (upward: reporting, coordination, and supervision through County Health management team; downward: health committees, or (in)formal contact with community representatives) • Support and supervision of health staff and CHW • Information management and learning • Regularity, completeness and use of HMIS and ERM • Referral practices • Coordinate and interact with community leaders, Non-Governmental Organizations (NGOs), Faith Based Organizations (FBOs), private providers, and other relevant stakeholders • Supply chain for medicines and commodities • Human resource management and performance meetings • Adequacy of infrastructure and maintenance of facility	• KIIs • Document/ Register review for referrals • FGD	• KIIs with facility staff, community representatives, county health authorities • FGDs with (young) women living in the catchment area of the CLCs • Counterfactual facility
6. To explore overall outcomes of the CLCs and draw lessons learned about the CLCs to the elements listed in the specific objectives 1-5	• Overall conclusion based on objective 1 to 6 including view on sustainability • Quality of care (realized quality and perceived quality) • Efficiency (value for money) • Utilization (effective coverage of essential health services) • Financial protection of the population for catastrophic costs (utilization) • Effects of the CLCs on social and economic life of the surrounding community. • Sustainability	• Realist evaluation • Framework	• KII Philips country office

ANNEX 1B KEY AND SPECIFIC EVALUATION QUESTIONS

Key evaluation questions	Specific evaluation questions
Relevance	
To what extent are the objectives and approach of the CLC responsive to the needs, context, and priorities of the targeted populations?	• What are mechanisms to assess and monitor specific needs and priorities of the community targeted population in the selected CLCs? • What specific needs of the community does the CLC address and what needs are not being addressed? • To what extent does service provision respond to the current burden of disease, and to the evolving needs in the light of demographic, epidemiological and nutritional transitions? • Does service provision respond to the perceived needs of the populations served?
To what extent are the objectives and approaches of the CLC intervention aligned with national policies and strategies?	• What synergies exist between the CLC concept and Kenya's strategic and policy directions to improve access to primary care services? • Is the CLC intervention in line with these policies and strategies? Are packages of services in agreement with these policies, and based on cost-effectiveness considerations? • Are approaches, tools, and interventions congruent with other (public) primary services in the same area of operation?
To what extent does the CLC outreach activities target specific population groups (women of reproductive age, children and the poorest)?	• What mechanisms exist at community level to ensure that specific population groups (e.g., children, woman, poor) are equally reached by the CHVs with backpacks? How is this monitored and by whom? • Are community outreach activities aligned with national policies? Are the backpacks (including tools, equipment, medicines & diagnostics) aligned with these policies?
How does the CLC concept promote stakeholder engagement in the delivery of primary healthcare services?	• What formal and informal contacts and procedures exist in relation to County health authorities; community leaders and representatives; users of services; Ministry of Health officials at national level; other relevant stakeholders?
Effectiveness	
To what extent is the population aware of the services provided at the CLC?	• How does the CLC inform the surrounding populations on the range of services it provides, including the outreach activities? • Are people in the community aware of the range of services provided through the CLC, including for outreach?
To what extent are the services provided at the CLC acceptable to the populations served?	• How do people, and specific sub-groups in the population, perceive the quality and cost of the services at the CLC? • What specific aspect of health service delivery within the CLC are people most proud of? • What specific services do people prefer at the CLC and for what services do they rather use other providers? • What distinguishes service provision at the CLC with other service providers

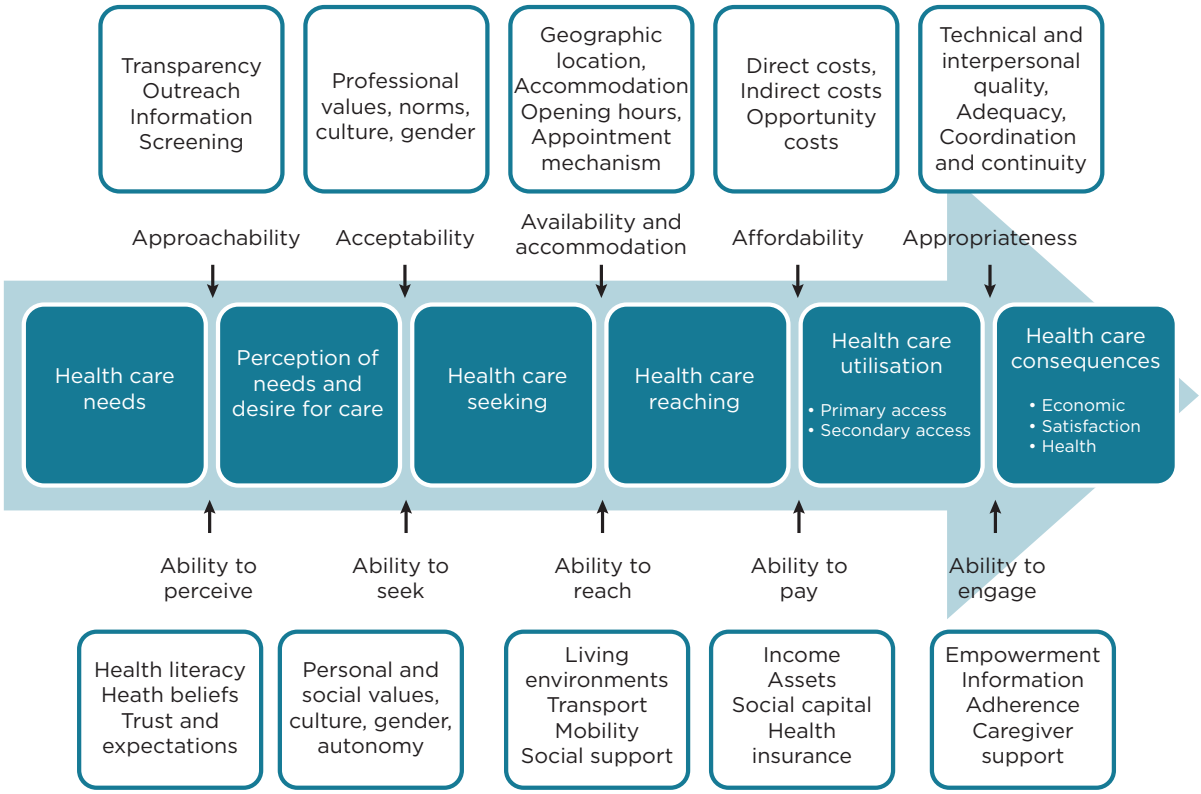
Can people easily use the CLC in terms of geographical access, accommodation and are services affordable?	• To what extent are the CLC services accessible in terms of distance, travel time and/or ease of accessing community based-provider or facility • Is public transport making the CLC accessible even for people who live not very close to the CLC? • What innovations has CLC introduced to address structural barriers to access to care within the community? • How does the CLC accommodate the population in terms of opening times and appointment arrangements? • Are services affordable to people; are there any prepayment arrangements existing; are there social support mechanisms offered for people who are unable to pay for services? • What do common services cost, also compared to alternative providers? What do people spend on indirect costs? Are there insurance plans?
Do the CLCs have sufficient resources available to offer a normal package of primary services?	• To what extent are essential health commodities available in sufficient quantities to cover the target population (e.g., drugs, vaccines) • To what extent are essential equipment and diagnostics available? • To what extent are human resources of correct skills mix available? • To what extent have facility staff and CHVs received training? And do they receive continuous training and supervision? • Is the infrastructure appropriate for the delivery of quality services? • Are (standard) treatment guidelines, flow charts, growth charts, partograms, registers and other appropriate tools and forms available for appropriate management of patients/clients? • Are safety conditions appropriate? (e.g., containers for disposal of needles, waste, etc.)
Are essential services used by the population?	• What is the output in terms of essential services provided, both as first use (ANC-1; DTP-1; BCG; SBA; OPD consultations) and in terms of continuity of care (ANC-4; DTP-3; TB cure rate; ART regularity; etc.); and what are the trends for the utilisation of these services over time? To what extent does the CLC impact *initial utilization* of services including determinants of this (e.g., affordability, accommodation, acceptability)? To what extent is *continuity of care* reached? • What are the services provided in outreach, and by CHVs? To what extent has the community outreach kit been used in diagnosis and triage patients, and referral to main healthcare network?
Is the quality of services appropriate?	For structural components: see questions under availability of resources *Process elements:* • Are treatments in agreement with evidence-based guidelines? • Are medicines prescribed rationally? (INRUD indicators) • Are there arrangements for screening of emergencies, so that they are attended immediately? • Are services integrated where appropriate and needed? ('One stop visit'; e.g., TB and HIV; missed opportunities for EPI; ANC and FP; ...) • Is the EMR system regularly updated and appropriately used? (Does it allow for appropriate follow-up of patients and clients?) • What is waiting time for OPD consultations, for FP, ANC...? • How do people perceive quality of care across number of variables? *Outcome elements:* See under outcomes and impact.

Efficiency	
What are the costs of providing services and support functions?*	• Are the outputs delivered as planned and according to the budget?* • What are the average costs for producing selected services, and for management/support processes?* – Services: delivery, ANC, OPD consultation, ... – Training & supervision of HRH and CHVs – Maintenance of infrastructure and equipment – Salaries and secondary benefits for staff, compared to counterfactual – Medicines and supplies • What do people pay for these services? What are the other sources of income for the CLC, also compared to the counterfactual facilities? How are deficits paid for?* • What are the costs of infrastructure set-up?*
Is management of the CLC appropriately functioning? How is efficiency of management processes and procedures?	• What is the status of the CLCs in relation to ownership, (co-)management responsibilities, financial responsibilities? Are these responsibilities and collaboration arrangements formalized in a formal agreement between the County authorities (representing MoH); communities; and Philips representatives? To what extent and how are other funders involved? • How are accountability relations with the County authorities organized? (financial, activities, ...) • Is information sent to the County regular and complete (M&E: DHIS2) • Is information from M&E used for decision making at the facility management level? (for decision making on individual patients/clients, see under quality of care) • How does management coordinate and interact with community leaders, Non-Governmental Organizations (NGOs), Faith Based Organizations (FBOs), private providers, and other relevant stakeholders? • Are HRH processes like recruitment, support, performance review, and supervision appropriately fulfilled? In relation to CLC staff, and also in relation to CHVs and other volunteers? • Is there any arrangement for social accountability or community engagement, and how is this organized? • To what extent and how has patient referral been formally organized?
Impact	
What is the impact of the CLC intervention on the effective coverage of healthcare?	• What is the contribution of the CLC to the effective coverage of selected interventions in the area that the CLC is serving? (EPI; SBA; ANC-4; TB; ART; ITN; overall OPD consultations; ...)
How satisfied are people with the services that the CLC provides?	• How satisfied are people generally, and in relation to specific services? • Is the CLC responsive to the needs and demands of people living in the area?
What is the impact of the CLC on financial protection of the population for catastrophic costs?	• Constraints people feel to visit and use CLC services; see health seeking behaviour.

What is the 'value for money' for the CLC concept and approach?*	• The 'value for money' impact will be discussed on the basis of information/questions mentioned under other headings. (What is the willingness to pay for services at the CLC? Perceived costs; efficiency of care and support processes; relative costs of services; etc.)* • How does the cost-effectiveness of the CLC compare across sites?*
What is the impact of CLC on community living conditions?	• How has the CLC affected the social and economic life of the community (e.g., security, waste, lighting for evening time social and economic activities)? • What are the mechanisms and causal pathways, that are likely to have contributed to the various impacts?
Sustainability	
To what extent is the concept and approach of the CLC sustainable (financially, organizationally, capacity wise, ...)?	• Discussion on the basis of information from the various sections above. • What are the barriers and facilitators for the delivery of primary healthcare services through the CLC concept? • How are the experience and lessons learnt from the implementation of the CLC concept influenced the local health policy and plans in relation to delivery of primary healthcare services?

*Not enough data to respond the question

ANNEX 2 LEVESQUE FRAMEWORK (13)AND DEFINITION OF TERMS (14)



Definitions of access dimensions based on Levesque et a.l

Supply-side dimensions of accessibility of services	Definitions	Demand-side abilities of patients to access services	Definitions
Approachability	Approachability of services relates to the fact that people facing healthcare needs can identify that some form of services exists, can be reached, and have an impact on their health.	Ability to perceive	Ability to perceive translates into the ability of people to identify their needs for care.
Acceptability	Acceptability of services relates to social and cultural factors determining the possibility for people to accept the aspects of a service.	Ability to seek	Ability to seek healthcare relates to factors that would determine expressing the intention to obtain healthcare.
Availability and accommodation	Availability and accommodation refers to the fact that health services (either the physical space or those working in healthcare roles) can be reached both physically and in a timely manner.	Ability to reach	Ability to reach healthcare relates to factors that would enable one person to physically reach service providers.
Affordability	Affordability reflects the economic capacity for people to spend resources and time to use appropriate services.	Ability to pay	Ability to pay for healthcare is described as the capacity to generate economic resources to pay for healthcare services without catastrophic expenditure of resources required for basic necessities.
Appropriateness	Appropriateness denotes the fit between services and clients' needs, its timeliness, the amount of care spent in assessing health problems and determining the correct treatment and the technical and interpersonal quality of the services provided.	Ability to engage	Ability to engage in healthcare relates to the participation and involvement of the client in decision-making and treatment decisions, which is in turn strongly determined by capacity and motivation to participate in care and commit to its completion.

ANNEX 3 CLIENT EXIT INTERVIEW RESPONDENT CHARACTERISTICS

Table I Characteristics of clients who visited one of the two CLCs or its counterfactual in Kiambu and Mandera county, Kenya (N=516)

	Kiambu county (N=254)	Facility		P	Mandera county (N=262)	Facility		P
		Githurai Lang'ata (CLC) (N=131)	Gachororo (N=123)			Dandu (CLC) (N=135)	Burduras (N=127)	
Gender, female N (%)	233 (91.73)	125 (95.45)	108 (87.80)	0.028	178 (67.94)	80 (59.26)	98 (77.17)	0.002
Age, median (range)	26 (17-70)	26 (17-70)	26 (17-56)	**0.523**[1]	27 (14 – 80)	26 (15 – 71)	28 (14 – 80)	**0.214**[2]
Kiambu sub-county, N (%)				<0.001				
Githurai	9 (3.54)	9 (6.87)	0 (0.00)					
Juja	119 (46.85)	0 (0.00)	119 (96.75)					
Kasrani	5 (1.97)	5 (3.82)	0 (0.00)					
Kiambu	3 (1.18)	3 (2.29)	0 (0.00)					
Mwiki	3 (1.18)	3 (2.29)	0 (0.00)					
Ruiru	115 (45.28)	111 (84.73)	4 (3.25)					
Mandera count, yes, N (%)					259 (98.85)	133 (98.52)	126 (99.21)	0.598
Mandera sub-county, N (%)								
Mandera West					249 (95.04)	126 (93.33)	123 (96.85)	
Mandera East					2 (0.76)	2 (1.48)	0 (0.00)	
Not specified					8 (3.04)	5 (3.70)	3 (2.36)	
Reason for visit, N(%) *				0.006				0.359
Antenatal Care	60 (23.62)	41 (31.30)	19 (15.45)		57 (21.76)	31 (22.96)	26 (20.47)	
Comprehensive Care Clinic	14 (5.49)	5 (3.79)	9 (7.32)		1 (0.38)	0 (0.00)	1 (0.79)	
Family Planning	8 (3.15)	6 (4.58)	2 (1.63)		0 (0.00)	0 (0.00)	0 (0.00)	
Maternity Ward	2 (0.79)	2 (1.53)	0 (0.00)		2 (0.76)	2 (1.48)	0 (0.00)	
Outpatient Department	170 (66.93)	77 (58.78)	93 (75.61)		202 (77.10)	102 (75.56)	100 (78.74)	
Type of care, preventive N(%) *	7 (27.56)	49 (37.40)	21 (17.07)	<0.001	59 (22.52)	33 (24.44)	26 (20.47)	0.442
Literacy, N (%)				0.327				
Read and write	249 (98.03)	130 (99.24)	119 (96.75)		46 (17.56)	28 (20.74)	18 (14.17)	0.390
Read only	1 (0.39)	0 (0.00)	1 (0.81)		4 (1.53)	3 (2.22)	1 (0.79)	
Illiterate	4 (1.57)	1 (0.76)	3 (2.44)		210 (80.15)	103 (76.30)	107 (84.25)	
Don't know	0 (0.00)	0 (0.00)	0 (0.00)		2 (0.76)	1 (0.74)	1 (0.79)	
Attended school, yes N(%)	251 (98.82)	131 (100.00)	120 (97.56)	0.0712	51 (19.47)	32 (23.70)	19 (14.96)	0.120

Level of education, N(%)				0.081				
Higher education	13 (5.18)	10 (7.63)	3 (2.50)		2 (3.92)	2 (6.25)	0 (0.00)	0.716
Middle education	46 (18.33)	28 (21.37)	18 (15.00)		5 (9.80)	3 (9.38)	2 (10.53)	
Lower education	191 (76.10)	92 (70.23)	99 (82.50)		42 (82.35)	26 (81.25)	16 (84.21)	
Other	1 (0.40)	1 (0.76)	0 (0.00)		2 (3.92)	1 (3.13)	1 (5.26)	
Highest level of formal education, N(%)				0.214				
University					2 (3.92)	2 (6.25)	0 (0.00)	0.812
College (middle level)	13 (5.18)	10 (7.63)	3 (2.50)		5 (9.80)	3 (9.38)	2 (10.53)	
Secondary	46 (18.33)	28 (21.37)	18 (15.00)		15 (29.41)	10 (31.25)	5 (26.32)	
Post primary/vocational	123 (49.00)	58 (44.27)	65 (54.17)		0 (0.00)	0 (0.00)	0 (0.00)	
Primary	5 (1.99)	3 (2.29)	2 (1.67)		27 (52.94)	16 (50.00)	11 (57.89)	
Nursery	63 (25.100)	31 (23.66)	32 (26.67)		0 (0.00)	0 (0.00)	0 (0.00)	
Informal	0 (0.00)	0 (0.00)	0 (0.00)		2 (3.92)	1 (3.13)	1 (5.26)	
Don't know	1 (0.40)	1 (0.76)	0 (0.00)		0 (0.00)	0 (0.00)	0 (0.00)	
	0 (0.00)	0 (0.00)	0 (0.00)					
Time spent on that level in years, median (range)	7 (0-23)	8 (0-17)	6 (1-23)	**0.402**[1]	5 (2 -18)	5 (2 – 18)	5 (2 – 16)	**0.852**[1]
Main generating income activity head of household, N (%)				0.252				<0.001
Subsistence farmer	2 (0.79)	2 (1.53)	0 (0.00)		19 (7.25)	5 (3.70)	14 (11.02)	
Small-scale business	66 (25.98)	30 (22.90)	36 (29.27)		17 (6.49)	15 (11.11)	2 (1.57)	
Large-scale business	4 (1.57)	2 (1.53)	2 (1.63)		0 (0.00)	0 (0.00)	0 (0.00)	
Transport industry **	9 (3.54)	5 (3.82)	4 (3.25)		0 (0.00)	0 (0.00)	0 (0.00)	
Tourist industry **	2 (0.79)	2 (1.53)	0 (0.00)		0 (0.00)	0 (0.00)	0 (0.00)	
Civil servant	14 (5.51)	10 (7.63)	4 (3.25)		12 (4.58)	9 (6.67)	3 (2.36)	
Casual labourer	87 (34.25)	43 (32.82)	44 (35.77)		50 (19.08)	30 (22.22)	20 (15.75)	
Home duties	7 (2.76)	6 (4.58)	1 (0.81)		79 (30.15)	29 (21.48)	50 (39.37)	
Unemployed	29 (11.42)	16 (12.21)	13 (10.57)		34 (12.98)	18 (13.33)	16 (12.60)	
Other	34 (13.39)	15 (11.45)	19 (15.45)		51 (19.47)	29 (21.48)	22 (17.32)	
Household owns animals, yes N(%)	56 (22.05)	38 (29.01)	18 (14.63)	0.006	225 (85.88)	110 (81.48)	115 (90.55)	0.035
Agricultural land owned, yes N(%)	126 (49.61)	68 (51.91)	58 (47.15)	0.460	49 (18.77)	20 (14.81)	29 (23.02)	0.090
Electronic furniture, yes N(%)	253 (99.61)	130 (99.24)	123 (100.00)	0.332	87 (33.21)	44 (32.59)	43 (33.86)	0.828
Owns a luxurious item ***	247 (97.24)	131 (100.00)	116 (94.31)	0.006	241 (91.98)	125 (92.59)	116 (91.34)	0.709

Has a bank account, yes N(%)	181 (71.26)	96 (73.28)	85 (69.11)	0.440	11 (4.20)	7 (5.19)	4 (3.15)	0.441
Average spent on food per month (KSh), median(range)	6,000 (0-30,000)	6,000 (0-18,000)	6,000 (0-30,000)	**0.79**[1]	5,000 (0-35,000)	6,000 (0-35,000)	5,000 (0 – 25,000)	**0.118**[2]
Average spent on clothing per month (KSh), median (range)	1,000 (0-20,000)	1,000 (0 – 20,000)	1,000 (0 – 10,000)	**0.937**[2]	1,000 (0-20,000)	1,500 (0 – 15,000)	1,000 (0 – 20,000)	**0.006**[1]
Average spent on education per month (KSh), median (range)	670 (0-52,000)	1,000 (0-52,000)	400 (0-20,000)	**0.289**[2]	0 (0 – 20,000)	0 (0 – 20,000)	0 (0 – 10,000)	**<0.001**[2]
SES, high N(%)	116 (45.67)	62 (47.33)	54 (43.90)	0.584	126 (48.09)	78 (57.78)	48 (37.80)	0.001

* Purposely sampled. ** Formally employed. *** luxurious items: watch, mobile phone, bicycle, motorcycle or motor scooter, animal drawn cart, car or truck, boat.

[1] : ANOVA analysis. [2] : Kruskal-Wallis H analysis

Abbreviations: CLC: community life centre; N: number; SD: standard deviation; %: percentage

Table II accessibility of clients who visited a CLC or a counterfactual in Kenya (N=516)

	Kiambu county (N=254)	Facility		P	Mandera county (N=262)	Facility		P
		Githurai Lang'ata (CLC) (N=131)	Gachororo (N=123)			Dandu (CLC) (N=135)	Burduras (N=127)	
Closets facility, yes N (%)	161 (63.39)	78 (59.54)	83 (67.48)	0.189		100 (74.07)	93 (73.23)	0.877
Reason not visiting nearest facility, N (%)				0.065				0.032
Inconvenient operating hours	1 (1.08)	0 (0.00)	1 (2.50)		2 (2.90)	2 (5.71)	0 (0.00)	
Bad reputation	27 (29.03)	14 (26.42)	13 (32.50)		0 (0.00)	0 (0.00)	0 (0.00)	
Do not like personnel	7 (7.53)	4 (7.55)	3 (7.50)		1 (1.45)	1 (2.86)	0 (0.00)	
No medicines available	2 (2.15)	2 (3.77)	0 (0.00		6 (8.70)	5 (14.29)	1 (2.94)	
It is more expensive	29 (31.18)	12 (22.64)	17 (42.50)		9 (13.04)	6 (17.14)	3 (8.82)	
Was referred to this facility	8 (8.60)	5 (9.43)	3 (7.50)		3 (4.35)	3 (8.57)	0 (0.00)	
Other	19 (20.43)	16 (30.19)	3 (7.50)		46 (66.67)	18 (51.43)	28 (82.35)	
Don't know	0 (0.00)	0 (0.00)	0 (0.00)		2 (2.90)	0 (0.00)	2 (5.88)	
Visited this facility before, yes, N (%)	219 (86.22)	117 (89.31)	102 (82.93)	0.140	234 (89.31)	120 (88.89)	114 (89.76)	0.819
Convenient opening hours, yes N (%)	196 (77.17)	97 (74.05)	99 (80.49)	0.322	219 (83.59)	104 (77.04)	115 (90.55)	0.012
Services available when needed, yes N (%)	200 (78.74)	101 (77.10)	99 (80.49)	0.543	218 (83.21)	101 (74.81)	117 (92.13)	0.001
Part of a prepayment plan, yes N (%)	122 (48.03)	66 (50.38)	56 (45.53)	0.439	15 (5.73)	10 (7.41)	5 (3.94)	0.024
Charged any money for visit, yes N (%)	15 (5.91)	7 (5.34)	8 (6.50)	0.695	40 (15.27)	30 (22.22)	10 (7.87)	0.001
Waiting time, N (%)								<0.001
<30 minutes	59 (23.23)	26 (19.85)	33 (26.83)		71 (27.10)	27 (20.00)	44 (34.65)	
30 – 60 minutes	88 (34.65)	42 (32.06)	46 (37.40)		140 (53.44)	62 (45.93)	78 (61.42)	
>60 minutes	107 (43.13)	63 (48.09)	44 (35.77)		51 (19.47)	46 (34.07)	5 (3.94)	
Considered waiting time reasonable, N (%)				0.001				<0.001
Yes	147 (57.87)	61 (46.56)	86 (69.92)		179 (68.32)	78 (57.78)	101 (79.53)	
Partially	27 (10.63)	17 (12.98)	10 (8.13)		36 (13.74)	41 (30.37)	20 (15.75)	
No	80 (31.50)	53 (40.46)	27 (21.95)		47 (17.94)	16 (11.85)	6 (4.72)	
Actual waiting time when clients considered their waiting time reasonable (N=326)								
>60 minutes	30 (20.41)	13 (21.31)	17 (19.77)	0.949	6 (3.35)	3 (3.85)	3 (2.97)	0.949
30-60 minutes	60 (40.82)	24 (39.34)	36 (41.86)		113 (63.13)	49 (62.82)	64 (63.37)	
<30 minutes	57 (38.78)	24 (39.34)	33 (38.37)		60 (33.52)	26 (33.33)	34 (33.66)	

Actual waiting time when clients considered their waiting time not reasonable (N=127)								
>60 minutes	61 (76.25)	40 (75.47)	21 (77.78)	0.770	38 (80.85)	36 (87.80)	2 (33.33)	<0.001
30-60 minutes	18 (22.50)	12 (22.64)	6 (22.22)		7 (14.89)	5 (12.20)	2 (33.33)	
<30 minutes	1 (1.35)	1 (1.89)	0 (0.00)		2 (4.26)	0 (0.00)	2 (33.33)	

Abbreviations: CLC: community life centre; N: number; Chi2: chi-square value; p: p-value

Table III: Average (SD) level of satisfaction per indicator and question, per facility in Kenya, N=518

	Kiambu county (N=254)	Facility		P	Mandera county (N=262)	Facility		P	Cronbach's alpha[2]
		Githurai Lang'ata (CLC) (N=131)	Gachororo (N=123)			Dandu (CLC) (N=135)	Burduras (N=127)		
Behaviour of the health staff	4.46 (0.76)	4.36 (0.81)	4.58 (0.68)	**0.007[1]**	4.14 (0.58)	4.12 (0.71)	4.15 (0.400)	**0.514[1]**	0.77
Friendly and respectful staff	4.46 (0.94)	4.40 (1.01)	4.53 (0.86)	0.239	4.21 (0.72)	4.22 (0.86)	4.21 (0.53)	0.141[1]	
Friendly and respectful provider	4.54 (0.81)	4.43 (0.94)	4.66 (0.61)	0.010[1]	4.16 (0.65)	4.16 (0.81)	4.17 (0.43)	0.172[1]	
Ability to discuss health problems	4.39 (1.05)	4.25 (1.14)	4.54 (0.92)	0.025[1]	4.03 (0.69)	3.99 (0.82)	4.09 (0.50)	0.724[1]	
Services	4.17 (0.75)	4.11 (0.71)	4.22 (0.79)	0.226	3.80 (0.61)	3.61 (0.74)	4.00 (0.34)	**<0.001[1]**	0.84
Trust in skills of the provider	4.52 (0.87)	4.59 (0.79)	4.45 (0.95)	**0.344[1]**	4.07 (0.69)	4.07 (0.76)	4.06 (0.60)	0.745[1]	
Amount of explanation	4.35 (1.07)	4.37 (1.01)	4.33 (1.21)	0.762	4.00 (0.75)	3.99 (0.91)	4.02 (0.53)	0.485[1]	
Quality of advice	4.33 (1.06)	4.33 (1.10)	4.41 (1.02)	0.518	3.96 (0.74)	3.90 (0.89)	4.02 (0.53)	0.646[1]	
Procedure or treatment	4.26 (1.13)	4.29 (1.07)	4.26 (1.20)	0.703	3.97 (0.71)	3.93 (0.81)	4.01 (0.51)	0.941[1]	
Availability of medicines	3.16 (1.49)	2.89 (1.50)	3.42 (1.44)	0.004	2.87 (1.24)	2.26 (1.17)	3.53 (0.93)	<0.001[1]	
Costs for services	4.61 (0.82)	4.63 (0.81)	4.60 (0.83)	0.696	3.77 (0.98)	3.42 (1.22)	4.15 (0.38)	<0.001[1]	
Time spent during consultation	4.33 (0.99)	4.45 (0.99)	4.41 (0.99)	0.775	3.95 (0.83)	3.76 (1.05)	4.14 (0.41)	0.031[1]	
Waiting time before consultation	3.64 (1.46)	3.35 (1.48)	3.95 (1.37)	<0.001	3.79 (0.89)	3.56 (1.10)	4.04 (0.49)	0.002[1]	
Infrastructure									0.30
Convenient to travel to the facility	4.44 (0.94)	4.34 (1.03)	4.56 (0.83)	0.052[1]	3.87 (1.14)	3.81 (1.27)	3.94 (0.99)	0.960[1]	
Cleanliness of the facility	4.50 (0.84)	4.70 (0.55)	4.28 (1.02)	<0.001[1]	4.37 (0.68)	4.47 (0.74)	4.25 (0.59)	<0.001[1]	
Privacy during consultation	4.50 (0.92)	4.57 (0.87)	4.43 (0.98)	0.222	4.44 (0.50)	4.53 (0.50)	4.35 (0.49)	0.004	
Overall visit	4.22 (1.13)	4.20 (1.11)	4.24 (1.15)	0.740	3.94 (0.71)	3.87 (0.85)	4.00 (0.51)	**0.515[1]**	
Total score	4.29 (0.64)	4.26 (0.62)	4.34 (0.66)	0.490	3.96 (0.49)	3.86 (0.60)	4.07 (0.31)	**0.004[1]**	0.77

[1] : Kruskal-Wallis H analysis; [2]: Cronbach's alpha indicates the internal consistency between the individual questions that compose the overall indicator

Abbreviations: SD: standard deviation; CLC: community life centre; N: number

Table IV: Proportion of clients per satisfaction level per question and facility in Kenya, N=516

	Kiambu county (N=254)	Facility		P	Mandera county (N=262)	Facility		P
		Githurai Lang'ata (CLC) (N=131)	Gachororo (N=123)			Dandu (CLC) (N=135)	Burduras (N=127)	
Convenient to travel to the facility, N (%)				0.352				0.086
Dissatisfied	6 (2.36)	4 (3.05)	2 (1.63)		11 (4.20)	9 6.67)	2 (1.57)	
No opinion	15 (5.91)	10 (7.63)	5 (4.07)		41 (15.65)	23 (17.04)	18 (14.17)	
Satisfied	233 (91.73)	117 (89.31)	116 (94.31)		210 (80.15)	103 (76.30)	107 (84.25)	
Cleanliness of the facility, N (%)				0.001				0.708
Dissatisfied	17 (6.69)	2 (1.53)	15 (12.20)		8 (3.05)	5 (3.70)	3 (2.36)	
No opinion	0 (0.00)	0 (0.00)	0 (0.00)		3 (1.15)	2 (1.48)	1 (0.79)	
Satisfied	237 (93.31)	129 (98.47)	108 (87.80)		251 (95.80)	128 (94.81)	123 (96.85)	
Friendly and respectful staff, N (%)				0.460				0.008
Dissatisfied	22 (8.66)	13 (9.92)	13 (9.85)		13 (4.96)	12 (8.89)	1 (0.79)	
No opinion	0 (0.00)	0 (0.00)	0 (0.00)		6 (2.29)	2 (1.48)	4 (3.15)	
Satisfied	232 (91.34)	118 (90.08)	119 (90.15)		243 (92.75)	121 (89.63)	122 (96.06)	
Friendly and respectful provider, N (%)				0.023				0.004
Dissatisfied	15 (5.91)	12 (9.16)	3 (2.44)		11 (4.20)	11 (8.15)	0 (0.00)	
No opinion	0 (0.00)	0 (0.00)	0 (0.00)		5 (1.91)	2 (1.48)	3 (2.36)	
Satisfied	239 (94.09)	199 (90.84)	120 (97.56)		246 (93.89)	122 (90.37)	124 (97.64)	
Trust in skills of the provider, N (%)				0.274				0.041
Dissatisfied	18 (7.09)	6 (4.58)	12 (9.76)		6 (2.29)	3 (2.22)	3 (2.36)	
No opinion	2 (0.79)	1 (0.76)	1 (0.81)		35 (13.36)	25 (18.52)	10 (7.87)	
Satisfied	234 (92.13)	124 (94.66)	110 (98.43)		221 (84.35)	107 (79.26)	114 (89.76)	
Amount of explanation, N (%)				0.536				0.006
Dissatisfied	30 (11.81)	14 (10.69)	16 (13.01)		16 (6.11)	14 (10.37)	2 (1.57)	
No opinion	1 (0.39)	1 (0.76)	0 (0.00)		25 (9.54)	15 (11.11)	10 (7.87)	
Satisfied	223 (87.80)	116 (88.55)	107 (86.99)		221 (84.35)	106 (78.52)	115 (90.55)	
Quality of advice, N (%)				0.316				0.002
Dissatisfied	30 (11.81)	17 (12.98)	13 (10.57)		16 (6.11)	15 (11.11)	1 (0.79)	
No opinion	2 (0.79)	2 (1.53)	0 (0.00)		29 (11.07)	16 (11.85)	13 (10.24)	

Satisfied	222 (87.40)	112 (85.50)	110 (89.43)		217 (82.82)	104 (77.04)	113 (89.98)	
Ability to discuss health problems, N (%)				0.068				0.003
Dissatisfied	28 (11.02)	19 (14.50)	9 (7.32)		10 (3.82)	10 (7.41)	0 (0.00)	
No opinion	0 (0.00)	0 (0.00)	0 (0.00)		28 (10.69)	17 (12.59)	11 (8.66)	
Satisfied	226 (88.98)	112 (85.50)	114 (92.68)		224 (85.50)	108 (80.00)	116 (91.34)	
Procedure or treatment, N (%)				0.651				0.010
Dissatisfied	36 (14.17)	16 (12.21)	20 (16.26)		15 (5.73)	13 (9.63)	2 (1.57)	
No opinion	2 (0.79)	1 (0.76)	1 (0.81)		25 (9.54)	15 (11.11)	10 (7.87)	
Satisfied	216 (85.04)	114 (87.02)	102 (82.93)		222 (84.73)	107 (79.36)	115 (90.55)	
Availability of medicines, N (%)				0.005				<0.001
Dissatisfied	112 (44.09)	67 (51.15)	45 (36.59)		129 (49.24)	100 (74.07)	29 (22.83)	
No opinion	17 (6.69)	12 (9.16)	5 (4.07)		12 (4.58)	3 (2.22)	9 (7.09)	
Satisfied	125 (49.21)	52 (39.69)	73 (59.35)		121 (46.18)	32 (23.70)	89 (70.08)	
Costs for services, N (%)				0.668				<0.001
Dissatisfied	12 (5.51)	8 (6.11)	6 (4.88)		47 (17.94)	47 (34.81)	0 (0.00)	
No opinion	0 (0.00)	0 (0.00)	0 (0.00)		3 (1.15)	2 (1.48)	1 (0.79)	
Satisfied	240 (94.49)	123 (93.89)	117 (95.12)		212 (80.92)	86 (63.70)	126 (99.21)	
Privacy during consultation, N (%)				0.541				0.302
Dissatisfied	21 (8.27)	10 (7.63)	11 (8.94)		1 (0.38)	0 (0.00)	1 (0.79)	
No opinion	1 (0.39)	1 (0.39)	1 (0.81)		0 (0.00)	0 (0.00)	0 (0.00)	
Satisfied	232 (91.34)	121 (92.37)	111 (90.24)		261 99.62)	135 (100.00)	126 (99.21)	
Overall visit, N (%)				0.610				0.009
Dissatisfied	32 (12.60)	17 (12.98)	15 (12.20)		19 (7.25)	16 (11.85)	3 (2.36)	
No opinion	1 (0.39)	1 (0.76)	0 (0.00)		17 (6.49)	10 (7.41)	7 (5.51)	
Satisfied	221 (87.01)	113 (86.26)	108 (87.80)		226 (86.26)	109 (80.74)	117 (92.13)	
Time spent during consultation, N (%)				0.706				<0.001
Dissatisfied	25 (9.84)	12 (9.16)	13 (10.57)		27 (10.31)	27 (20.00)	0 (0.00)	
No opinion	0 (0.00)	0 (0.00)	0 (0.00)		4 (1.53)	1 (0.74)	3 (2.36)	
Satisfied	229 (90.16)	119 (90.84)	110 (89.43)		231 (88.17)	107 (79.26)	124 (97.64)	
Waiting time before consultation, N (%)				0.002				<0.001
Dissatisfied	77 (30.31)	51 (38.93)	26 (21.14)		40 (15.17)	37 (27.41)	3 (2.36)	
No opinion	0 (0.00)	0 (0.00)	0 (0.00)		7 (2.67)	3 (2.22)	4 (3.15)	
Satisfied	117 (69.69)	80 (61.07)	97 (78.86)		215 (82.06)	95 (70.37)	120 (94.49)	

Abbreviations: CLC: community life centre; N: number; %: percentage

ANNEX 4 CHARACTERISTICS OF PEOPLE LIVING IN CATCHMENT AREA OF CLC-GITHURAI WHO NEEDED CARE – HOUSEHOLD SURVEY

	Visited a health service provider		
	No(N=23)	Yes(N=234)	Overall(N=1246)
SEX			
female	13 (56.5%)	142 (60.7%)	675 (54.2%)
male	10 (43.5%)	92 (39.3%)	571 (45.8%)
Age			
Mean (SD)	16.5 (11.9)	24.7 (16.7)	23.3 (14.8)
Median [Min, Max]	18.0 [2.00, 48.0]	26.0 [0, 87.0]	24.0 [0, 87.0]
RELIGION			
Christian (catholic)	5 (21.7%)	34 (14.5%)	166 (13.3%)
Christian (protestant)	3 (13.0%)	44 (18.8%)	235 (18.9%)
Muslim	0 (0%)	3 (1.3%)	8 (0.6%)
no religion	0 (0%)	3 (1.3%)	10 (0.8%)
Don't know	0 (0%)	0 (0%)	1 (0.1%)
other religion	0 (0%)	0 (0%)	5 (0.4%)
Missing	15 (65.2%)	150 (64.1%)	821 (65.9%)
PRIMARY CAREGIVER			
Head of household	6 (26.1%)	51 (21.8%)	207 (16.6%)
Wife/Husband/Partner	2 (8.7%)	29 (12.4%)	204 (16.4%)
Sister/Brother	0 (0%)	0 (0%)	2 (0.2%)
Parent in-law	0 (0%)	1 (0.4%)	1 (0.1%)
Son or Daughter	0 (0%)	3 (1.3%)	9 (0.7%)
Other relatives	0 (0%)	0 (0%)	1 (0.1%)
Other (specify)	0 (0%)	0 (0%)	1 (0.1%)
Missing	15 (65.2%)	150 (64.1%)	821 (65.9%)
HAS A CHRONIC CONDITION			
No	21 (91.3%)	197 (84.2%)	730 (58.6%)
Yes	2 (8.7%)	36 (15.4%)	57 (4.6%)
Missing	0 (0%)	1 (0.4%)	459 (36.8%)
HAS ILLNESS IN THE PAST 3 MONTHS PRIOR TO SURVEY			
No	5 (21.7%)	61 (26.1%)	522 (41.9%)
Yes	18 (78.3%)	173 (73.9%)	266 (21.3%)
Missing	0 (0%)	0 (0%)	458 (36.8%)
HAS VISITED A HEALTH SERVICE PROVIDER IN RELATION TO ILLNESS IN THE 3 MONTHS PRIOR TO SURVEY			
No	16 (69.6%)	0 (0%)	16 (1.3%)
Yes	0 (0%)	170 (72.6%)	170 (13.6%)
Missing	7 (30.4%)	64 (27.4%)	1060 (85.1%)

HAS VISITED A HEALTH SERVICE PROVIDER FOR OTHER REASON THAN ILLNESS IN THE 3 MONTHS PRIOR TO SURVEY			
No	7 (30.4%)	1 (0.4%)	8 (0.6%)
Yes	0 (0%)	79 (33.8%)	79 (6.3%)
Missing	16 (69.6%)	154 (65.8%)	1159 (93.0%)
LOCATION COMPARED TO CLC			
<3km	12 (52.2%)	120 (51.3%)	674 (54.1%)
=>3km	11 (47.8%)	114 (48.7%)	572 (45.9%)
HAS VISITED THE CLC			
No	11 (47.8%)	60 (25.6%)	357 (28.7%)
Yes	4 (17.4%)	68 (29.1%)	363 (29.1%)
Missing	8 (34.8%)	106 (45.3%)	526 (42.2%)
TYPE OF PROVIDER VISITED			
chemist/pharmacist/shop	0 (0%)	6 (2.6%)	6 (0.5%)
don't know	0 (0%)	1 (0.4%)	1 (0.1%)
mission health and dispensary	0 (0%)	2 (0.9%)	2 (0.2%)
mission hospital	0 (0%)	5 (2.1%)	5 (0.4%)
private clinic	0 (0%)	39 (16.7%)	39 (3.1%)
private hospital	0 (0%)	72 (30.8%)	72 (5.8%)
Public health centre and dispensary	0 (0%)	45 (19.2%)	45 (3.6%)
public hospital	0 (0%)	63 (26.9%)	63 (5.1%)
other (specify)	0 (0%)	1 (0.4%)	1 (0.1%)
Missing	23 (100%)	0 (0%)	1012 (81.2%)
TYPE OF VISIT			
emergency visit	0 (0%)	9 (3.8%)	9 (0.7%)
non-emergency treatment visit	0 (0%)	98 (41.9%)	98 (7.9%)
preventive visit	0 (0%)	59 (25.2%)	59 (4.7%)
other (specify)	0 (0%)	3 (1.3%)	3 (0.2%)
Missing	23 (100%)	65 (27.8%)	1077 (86.4%)
TYPE OF PROVIDER NEAREST TO INHABITATION			
chemist/pharmacist/shop	0 (0%)	8 (3.4%)	8 (0.6%)
mission health and dispensary	0 (0%)	2 (0.9%)	2 (0.2%)
mission hospital	0 (0%)	2 (0.9%)	2 (0.2%)
private clinic	0 (0%)	72 (30.8%)	72 (5.8%)
private hospital	0 (0%)	77 (32.9%)	77 (6.2%)
Public health centre and dispensary	0 (0%)	35 (15.0%)	35 (2.8%)
public hospital	0 (0%)	28 (12.0%)	28 (2.2%)
other (specify)	0 (0%)	1 (0.4%)	1 (0.1%)
don't know	0 (0%)	4 (1.7%)	4 (0.3%)
Missing	23 (100%)	5 (2.1%)	1017 (81.6%)
TRAVEL TIME TO PROVIDER			
30 minutes or less	0 (0%)	177 (75.6%)	177 (14.2%)
Between 1 hour and 2 hours	0 (0%)	14 (6.0%)	14 (1.1%)

Between 30 minutes and 1 hour	0 (0%)	35 (15.0%)	35 (2.8%)
Don't know	0 (0%)	3 (1.3%)	3 (0.2%)
Missing	23 (100%)	5 (2.1%)	1017 (81.6%)
TRANSPORT TO PROVIDER			
Own motorised vehicle (car or motorcycle)	0 (0%)	7 (3.0%)	7 (0.6%)
Public transport (matatu, bus, mototaxi)	0 (0%)	45 (19.2%)	45 (3.6%)
Walking	0 (0%)	64 (27.4%)	64 (5.1%)
Don't know	0 (0%)	2 (0.9%)	2 (0.2%)
Other (specify)	0 (0%)	1 (0.4%)	1 (0.1%)
Missing	23 (100%)	115 (49.1%)	1127 (90.4%)
LITERACY			
Read and write	15 (65.2%)	164 (70.1%)	179 (14.4%)
Read only	0 (0%)	1 (0.4%)	1 (0.1%)
None	1 (4.3%)	23 (9.8%)	24 (1.9%)
Missing	7 (30.4%)	46 (19.7%)	1042 (83.6%)
HAS BEEN TO SCHOOL			
No	1 (4.3%)	24 (10.3%)	25 (2.0%)
Yes	15 (65.2%)	163 (69.7%)	178 (14.3%)
Don't know	0 (0%)	1 (0.4%)	1 (0.1%)
Missing	7 (30.4%)	46 (19.7%)	1042 (83.6%)
HIGHEST LEVEL OF SCHOOL			
College (middle level)	2 (8.7%)	32 (13.7%)	34 (2.7%)
Primary	4 (17.4%)	36 (15.4%)	40 (3.2%)
Secondary	4 (17.4%)	76 (32.5%)	80 (6.4%)
University	5 (21.7%)	14 (6.0%)	19 (1.5%)
Post primary/vocational	0 (0%)	3 (1.3%)	3 (0.2%)
Don't know	0 (0%)	2 (0.9%)	2 (0.2%)
Missing	8 (34.8%)	71 (30.3%)	1068 (85.7%)
YEARS OF SCHOOLING COMPLETED			
Mean (SD)	4.33 (2.16)	4.39 (1.99)	4.38 (2.00)
Median [Min, Max]	4.00 [1.00, 8.00]	4.00 [0, 8.00]	4.00 [0, 8.00]
Missing	8 (34.8%)	73 (31.2%)	1070 (85.9%)
HAS INSURANCE			
No	12 (52.2%)	107 (45.7%)	630 (50.6%)
Yes	11 (47.8%)	121 (51.7%)	583 (46.8%)
Don't know	0 (0%)	1 (0.4%)	8 (0.6%)
Missing	0 (0%)	5 (2.1%)	25 (2.0%)
HAS LIVESTOCK			
No	22 (95.7%)	177 (75.6%)	976 (78.3%)
Yes	1 (4.3%)	51 (21.8%)	244 (19.6%)
Don't know	0 (0%)	1 (0.4%)	1 (0.1%)
Missing	0 (0%)	5 (2.1%)	25 (2.0%)
OWNS LAND			
No	18 (78.3%)	166 (70.9%)	883 (70.9%)

Yes	5 (21.7%)	63 (26.9%)	338 (27.1%)
Missing	0 (0%)	5 (2.1%)	25 (2.0%)
HAS ELECTRICITY			
Yes	23 (100%)	223 (95.3%)	1178 (94.5%)
No	0 (0%)	6 (2.6%)	43 (3.5%)
Missing	0 (0%)	5 (2.1%)	25 (2.0%)
KSH SPENT PER MONTH ON FOOD			
Mean (SD)	10200 (10600)	9340 (8340)	9480 (9340)
Median [Min, Max]	6000 [0, 50000]	7000 [0, 60000]	7000 [0, 80000]
Missing	0 (0%)	5 (2.1%)	25 (2.0%)
KSH SPENT PER MONTH ON CLOTHING			
Mean (SD)	2130 (2480)	2100 (2370)	1990 (2340)
Median [Min, Max]	1000 [0, 10000]	1500 [0, 16000]	1000 [0, 16000]
Missing	0 (0%)	5 (2.1%)	25 (2.0%)
KSH SPENT PER MONTH ON EDUCATION			
Mean (SD)	6440 (11100)	5610 (10500)	5890 (9740)
Median [Min, Max]	3000 [0, 45000]	1500 [0, 60000]	2600 [0, 60000]
Missing	0 (0%)	5 (2.1%)	25 (2.0%)
VISITED A SERVICE PROVIDER			
No	23 (100%)	0 (0%)	23 (1.8%)
Yes	0 (0%)	234 (100%)	234 (18.8%)
Missing	0 (0%)	0 (0%)	989 (79.4%)

ANNEX 5 DHIS2 COMPLETENESS

Table I: Missing observations per indicator and organisation unit from January 2009 to September 2019. Months N=132

	Organisation unit					
Indicator	Kiambu county (N=132)	Githurai Lang'ata Health Centre (N=132)	Gachororo (N=132)	Mandera county (N=132)	Dandu (N=132)	Burduras (N=132)
General information						
Population under 1, N	0 (0.00) (%)	120 (90.91)	120 (90.91)	0 (0.00)	84 (63.64)	84 (63.64)
Total population, N (%)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)
Reproductive, maternal, new-born, and child health (RMNCH)						
Dimension: Pregnancy and delivery care						
Proportion of women attending at least one ANC visit, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	24 (18.18)	84 (63.64)	84 (63.64)
Proportion of women attending four or more ANC visit, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	0 (0.00)	84 (63.64)	84 (63.64)
Women attending four or more ANC visits, N (%)	13 (10.61)	53 (40.15)	48 (36.36)	26 (19.70)	40 (30.30)	75 (56.82)
Proportion of skilled assisted births, N (%)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)
Estimated deliveries, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	0 (0.00)	84 (63.64)	84 (63.64)
Estimated pregnant women, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	36 (27.27)	108 (81.82)	96 (72.73)

Dimension: Child immunisation						
Proportion of children receiving 3 doses of DPT vaccine, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	0 (0.00)	84 (63.64)	84 (63.64)
Proportion of fully immunized children <1, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	0 (0.00)	84 (63.64)	84 (63.64)
Fully immunized children <1, N (%)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)
Proportion receiving measles 1 vaccine, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	0 (0.00)	84 (63.64)	84 (63.64)
Proportion receiving measles 2 vaccine, N (%)	0 (0.00)	120 (90.91)	120 (90.91)	0 (0.00)	84 (63.64)	84 (63.64)
Infectious diseases						
Dimension: Tuberculosis (TB) treatment						
TB cases detected, N	0 (0.00)	45	42	0 (0.00)	27 (20.45)	28 (21.21)
TB patients completing treatment, N (%)	35 (26.52)	131 (99.24)	119 (90.15)	0 (0.00)	27 (20.45)	28 (21.21)
TB treatment success rate, N (%)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)	132 (100.00)
TB cases clinically diagnosed, N (%)	0 (0.00)	45 (34.09)	42 (31.82)	0 (0.00)	27 (20.45)	28 (21.21)
TB cases bacteriologically confirmed, N (%)	0 (0.00)	45 (34.09)	42 (31.82)	0 (0.00)	27 (20.45)	28 (21.21)
Dimension: Human immunodeficiency virus (HIV) treatment						
HIV positive cases receiving ART treatment, N (%)	0 (0.00)	45 (34.09)	42 (31.82)	0 (0.00)	27 (20.45)	28 (21.21)

HIV positive cases starting ART treatment, N (%)	0 (0.00)	45 (34.09)	42 (31.82)	0 (0.00)	27 (20.45)	28 (21.21)

Abbreviations: N: number; ANC: antenatal care; DPT: Diphtheria-pertussis-tetanus; TB: Tuberculosis; HIV: human immunodeficiency virus

Table II
Visualisations of the proportion of available observations per indicator and organisation unit stratified per year. To describe completeness of the DHIS2 dataset, table II below includes "traffic light" tables for Kiambu County facilities, CLC-Githurai, CLC-Githurai's control facility (Gachororo), Mandera County facilities, CLC-Dandu, and CLC-Dandu's control facility (Burduras). Numbers denote percentages of available observations per indicator per year, coloured green when observations were ≥75% available, yellow when ≥50% but <75%, and red when <50% of observations were available.

Kiambu County	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Population under 1	100	100	100	100	100	100	100	100	100	100	100
Total Population	0	0	0	0	0	0	0	0	0	0	0
Proportion of women attending at least one ANC visit	100	100	100	100	100	100	100	100	100	100	100
Proportion of women attending four or more ANC visits	100	100	100	100	100	100	100	100	100	100	100
Women attending four or more ANC visits	100	100	100	100	100	100	100	100	100	100	100
Proportion of skilled assisted births	0	0	0	0	0	0	0	0	0	0	0
Estimated deliveries	100	100	100	100	100	100	100	100	100	100	100
Estimated pregnant women	100	100	100	100	100	100	100	100	100	100	100
Proportion of children received 3 does of DPT vaccine	100	100	100	100	100	100	100	100	100	100	100
Proportion of fully immunised children < 1	100	100	100	100	100	100	100	100	100	100	100
Fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	0
Proportion of children < 1 receiving measles 1 vaccine	100	100	100	100	100	100	100	100	100	100	100
Proportion of children < 1 receiving measles 2 vaccine	100	100	100	100	100	100	100	100	100	100	100
TB cases detected	100	100	100	100	100	100	100	100	100	100	100
TB patients completing treatment	0	0	100	100	100	100	100	100	75	57	83
TB treatment success rate	0	0	0	0	0	0	0	0	0	0	0
TB cases clinically diagnosed	100	100	100	100	100	100	100	100	100	100	100
TB cases bacteriologically confirmed	100	100	100	100	100	100	100	100	100	100	100
HIV positive cases receiving ART treatment	100	100	100	100	100	100	100	100	100	100	100
HIV positive cases starting ART treatment	100	100	100	100	100	100	100	100	100	100	100

Githurai Lang'ata	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Population under 1	0	0	0	0	0	0	0	0	0	0	100
Total Population	0	0	0	0	0	0	0	0	0	0	0
Proportion of women attending at least one ANC visit	0	0	0	0	0	0	0	0	0	0	100
Proportion of women attending four or more ANC visits	0	0	0	0	0	0	0	0	0	0	100
Women attending four or more ANC visits	0	0	0	25	100	100	100	100	67	92	75
Proportion of skilled assisted births	0	0	0	0	0	0	0	0	0	0	0
Estimated deliveries	0	0	0	0	0	0	0	0	0	0	100
Estimated pregnant women	0	0	0	0	0	0	0	0	0	0	100
Proportion of children received 3 does of DPT vaccine	0	0	0	0	0	0	0	0	0	0	100
Proportion of fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	100
Fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	100
Proportion of children < 1 receiving measles 1 vaccine	0	0	0	0	0	0	0	0	0	0	100
Proportion of children < 1 receiving measles 2 vaccine	0	0	0	0	0	0	0	0	0	0	100
TB cases detected	0	0	0	33	100	100	100	100	92	100	100
TB patients completing treatment	0	0	0	0	8	0	0	0	0	0	0
TB treatment success rate	0	0	0	0	0	0	0	0	0	0	0
TB cases clinically diagnosed	0	0	0	33	100	100	100	100	92	100	100
TB cases bacteriologically confirmed	0	0	0	33	100	100	100	100	92	100	100
HIV positive cases receiving ART treatment	0	0	0	33	100	100	100	100	92	100	100
HIV positive cases starting ART treatment	0	0	0	33	100	100	100	100	92	100	100

Gachororo	2009	2010	2011	2012	2013	2014	2015	2016	2018	2018	2029
Population under 1	0	0	0	0	0	0	0	0	0	0	100
Total Population	0	0	0	0	0	0	0	0	0	0	0
Proportion of women attending at least one ANC visit	0	0	0	0	0	0	0	0	0	0	100
Proportion of women attending four or more ANC visits	0	0	0	0	0	0	0	0	0	0	100
Women attending four or more ANC visits	0	0	0	50	100	100	100	100	83	92	75
Proportion of skilled assisted births	0	0	0	0	0	0	0	0	0	0	0
Estimated deliveries	0	0	0	0	0	0	0	0	0	0	100
Estimated pregnant women	0	0	0	0	0	0	0	0	0	0	100
Proportion of children received 3 does of DPT vaccine	0	0	0	0	0	0	0	0	0	0	100
Proportion of fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	100
Fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	0
Proportion of children < 1 receiving measles 1 vaccine	0	0	0	0	0	0	0	0	0	0	100
Proportion of children < 1 receiving measles 2 vaccine	0	0	0	0	0	0	0	0	0	0	100
TB cases detected	0	0	0	50	100	100	100	100	100	100	100
TB patients completing treatment	0	0	0	0	0	0	25	67	17	0	0
TB treatment success rate	0	0	0	0	0	0	0	0	0	0	0
TB cases clinically diagnosed	0	0	0	50	100	100	100	100	100	100	100
TB cases bacteriologically confirmed	0	0	0	50	100	100	100	100	100	100	100
HIV positive cases receiving ART treatment	0	0	0	50	100	100	100	100	100	100	100
HIV positive cases starting ART treatment	0	0	0	50	100	100	100	100	100	100	100

Mandera County	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Population under 1	100	100	100	100	100	100	100	100	100	100	100
Total Population	0	0	0	0	0	0	0	0	0	0	0
Proportion of women attending at least one ANC visit	0	0	100	100	100	100	100	100	100	100	100
Proportion of women attending four or more ANC visits	100	100	100	100	100	100	100	100	100	100	100
Women attending four or more ANC visits	0	0	100	100	100	100	100	100	100	100	100
Proportion of skilled assisted births	0	0	0	0	0	0	0	0	0	0	0
Estimated deliveries	100	100	100	100	100	100	100	100	100	100	100
Estimated pregnant women	100	100	100	100	100	100	100	100	100	100	100
Proportion of children received 3 does of DPT vaccine	100	100	100	100	100	100	100	100	100	100	100
Proportion of fully immunised children < 1	100	100	100	100	100	100	100	100	100	100	100
Fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	0
Proportion of children < 1 receiving measles 1 vaccine	100	100	100	100	100	100	100	100	100	100	100
Proportion of children < 1 receiving measles 2 vaccine	100	100	100	100	100	100	100	100	100	100	100
TB cases detected	100	100	100	100	100	100	100	100	100	100	100
TB patients completing treatment	100	100	100	100	100	100	100	100	100	100	100
TB treatment success rate	0	0	0	0	0	0	0	0	0	0	0
TB cases clinically diagnosed	100	100	100	100	100	100	100	100	100	100	100
TB cases bacteriologically confirmed	100	100	100	100	100	100	100	100	100	100	100
HIV positive cases receiving ART treatment	100	100	100	100	100	100	100	100	100	100	100
HIV positive cases starting ART treatment	100	100	100	100	100	100	100	100	100	100	100

Dandu Health Center	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Population under 1	0	0	100	100	100	100	0	0	0	0	0
Total Population	0	0	0	0	0	0	0	0	0	0	0
Proportion of women attending at least one ANC visit	0	0	100	100	100	100	0	0	0	0	0
Proportion of women attending four or more ANC visits	0	0	100	100	100	100	0	0	0	0	0
Women attending four or more ANC visits	0	0	43	100	83	83	83	100	92	100	83
Proportion of skilled assisted births	0	0	0	0	0	0	0	0	0	0	0
Estimated deliveries	0	0	100	100	100	100	0	0	100	0	0
Estimated pregnant women	0	0	0	0	100	100	0	0	100	0	0
Proportion of children received 3 does of DPT vaccine	0	0	100	100	100	100	0	0	100	0	0
Proportion of fully immunised children < 1	0	0	100	100	100	100	0	0	100	0	0
Fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	0
Proportion of children < 1 receiving measles 1 vaccine	0	0	100	100	100	100	0	0	100	0	0
Proportion of children < 1 receiving measles 2 vaccine	0	0	100	100	100	100	0	0	100	0	0
TB cases detected	0	0	100	100	100	100	0	0	100	0	0
TB patients completing treatment	0	0	100	100	100	100	92	100	100	100	83
TB treatment success rate	0	0	0	0	0	0	0	0	0	0	0
TB cases clinically diagnosed	0	0	100	100	100	100	92	100	100	100	83
TB cases bacteriologically confirmed	0	0	100	100	100	100	92	100	100	100	83
HIV positive cases receiving ART treatment	0	0	100	100	100	100	92	100	100	100	83
HIV positive cases starting ART treatment	0	0	100	100	100	100	92	100	100	100	83

Burduras Health Center	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Population under 1	0	0	100	100	100	100	0	0	0	0	0
Total Population	0	0	0	0	0	0	0	0	0	0	0
Proportion of women attending at least one ANC visit	0	0	100	100	100	100	0	0	0	0	0
Proportion of women attending four or more ANC visits	0	0	100	100	100	100	0	0	0	0	0
Women attending four or more ANC visits	0	0	33	33	25	25	17	75	92	92	83
Proportion of skilled assisted births	0	0	0	0	0	0	0	0	0	0	0
Estimated deliveries	0	0	100	100	100	100	0	0	100	0	0
Estimated pregnant women	0	0	0	100	100	100	0	0	100	0	0
Proportion of children received 3 does of DPT vaccine	0	0	100	100	100	100	0	0	100	0	0
Proportion of fully immunised children < 1	0	0	100	100	100	100	0	0	100	0	0
Fully immunised children < 1	0	0	0	0	0	0	0	0	0	0	0
Proportion of children < 1 receiving measles 1 vaccine	0	0	100	100	100	100	0	0	100	0	0
Proportion of children < 1 receiving measles 2 vaccine	0	0	100	100	100	100	0	0	100	0	0
TB cases detected	0	0	100	100	100	100	0	0	100	0	0
TB patients completing treatment	0	0	100	100	100	100	92	100	100	100	83
TB treatment success rate	0	0	0	0	0	0	0	0	0	0	0
TB cases clinically diagnosed	0	0	100	100	100	100	92	100	100	100	83
TB cases bacteriologically confirmed	0	0	100	100	100	100	92	100	100	100	83
HIV positive cases receiving ART treatment	0	0	100	100	100	100	92	100	100	100	83
HIV positive cases starting ART treatment	0	0	100	100	100	100	92	100	100	100	83

Table III:
Missing observations per indicator and facilities organized per facility level within the 6km range of the CLC in Kiambu county from January 2009 to September 2019. Observations N = 17,556. Months N=132

	Organisation unit					
Indicator	Level 1 (N=264)	Level 2 (N=12,144)	Level 3 (N=2,376)	Level 4 (N=528)	No level (N-396)	Total (N=15,840)
Number of facilities	2	92	18	4	3	120
General information						
Population under 1, N (%)	240 (90.91)	10,692 (88.04)	1,872 (78.79)	384 (72.73)	396 (100.00)	13,320 (84.09)
Total population, N (%)	264 (100.00)	12,144 (100.00)	2,376 (100.00)	528 (100.00)	396 (100.00)	15,840 (100.00)
Reproductive, maternal, new-born, and child health (RMNCH)						
Dimension: Pregnancy and delivery care						
Proportion of women attending at least one ANC visit, N (%)	240 (90.91)	10,704 (88.14)	1,884 (79.29)	384 (72.73)	24 (6.06)	13,368 (84.39)
Proportion of women attending four or more ANC visit, N (%)	240 (90.91)	10,704 (88.14)	1,872 (78.79)	384 (72.73)	0 (0.00)	13,332 (84.17)
Women attending four or more ANC visits, N (%)	263 (99.62)	9,055 (74.56)	1,440 (60.61)	175 (33.14)	42 (10.61)	11,106 (70.11)
Proportion of skilled assisted births, N (%)	264 (100.00)	12,144 (100.00)	2,376 (100.00)	528 (100.00)	394 (99.49)	15,838 (99.99)
Estimated deliveries, N (%)	240 (90.91)	10,704 (88.14)	1,872 (78.79)	384 (72.73)	0 (0.00)	13,332 (84.17)
Estimated pregnant women, N (%)	240 (90.91)	10,752 (88.54)	1,968 (82.83)	396 (75.00)	36 (9.09)	13,524 (85.38)
Dimension: Child immunisation						
Proportion of children receiving 3 doses of DPT vaccine, N (%)	240 (90.91)	10,692 (88.04)	1,872 (78.79)	384 (72.73)	0 (0.00)	13,320 (84.09)
Proportion of fully immunized children <1, N (%)	240 (90.91)	10,692 (88.04)	1,872 (78.79)	384 (72.73)	0 (0.00)	13,320 (84.09)
Fully immunized children <1, N (%)	264 (100.00)	12,144 (100.00)	2,376 (100.00)	528 (100.00)	396 (100.00)	15,840 (100.00)
Proportion receiving measles 1 vaccine, N (%)	240 (90.91)	10,692 (88.04)	1,872 (78.79)	384 (72.73)	0 (0.00)	13,320 (84.09)
Proportion receiving measles 2 vaccine, N	240 (90.91)	10,692 (88.04)	1,872 (78.79)	384 (72.73)	0 (0.00)	13,320 (84.09)

Infectious diseases						
Dimension: Tuberculosis (TB) treatment						
TB cases detected, N (%)	239 (90.53)	6,923 (57.01)	1,199 (50.46)	106 (20.08)	0 (0.00)	8,597 (54.27)
TB patients completing treatment, N (%)	264 (100.00)		2,230 (93.86)	449 (85.04)	95 (23.99)	
TB treatment success rate, N (%)	264 (100.00)	12,144 (100.00)	2,376 (100.00)	528 (100.00)	396 (100.00)	15,840 (100.00)
TB cases clinically diagnosed, N (%)	239 (90.53)	6,923 (57.01)	1,199 (50.46)	106 (20.08)	0 (0.00)	8,597 (54.27)
TB cases bacteriologically confirmed, N (%)	239 (90.53)	6,923 (57.01)	1,199 (50.46)	106 (20.08)	0 (0.00)	8,597 (54.27)
Dimension: Human immunodeficiency virus (HIV) treatment						
HIV positive cases receiving ART treatment, N (%)	239 (90.53)	6,923 (57.01)	1,199 (50.46)	106 (20.08)	0 (0.00)	8,597 (54.27)
HIV positive cases starting ART treatment, N (%)	239 (90.53)	6,923 (57.01)	1,199 (50.46)	106 (20.08)	0 (0.00)	8,597 (54.27)

Abbreviations: N: number; ANC: antenatal care; DPT: Diphtheria-pertussis-tetanus; TB: Tuberculosis; HIV: human immunodeficiency virus. No level = country and county aggregated data.

ANNEX 6 COLLABORATION PARTNERS

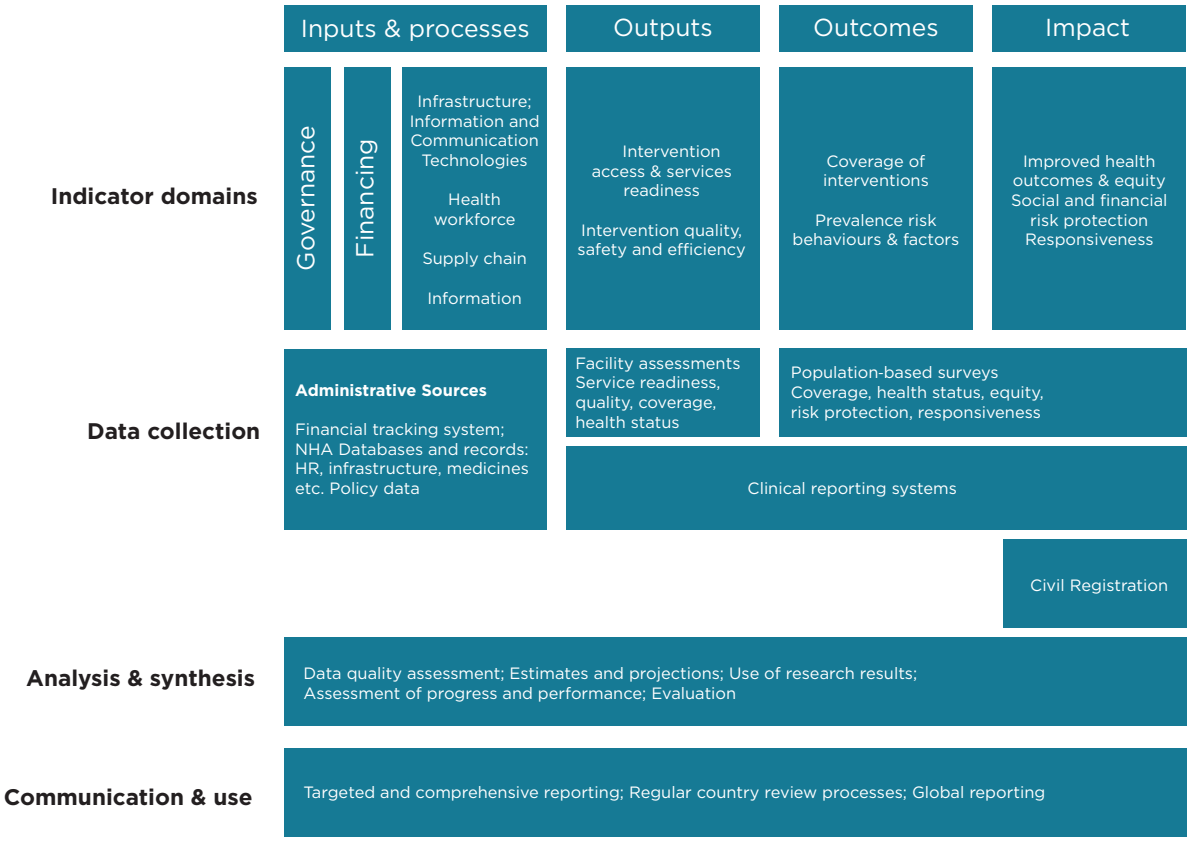
The tables below provide an overview of the CLC and control facility partners mentioned by the key informants interviewed

Collaboration partner CLC-Githurai	Tasks
Ministry (Sub-county, County), national government	outreach (Sub-County), personnel and commodities, vaccines campaign, immunization supplier, campaigned for the CLC in the beginning, provide workforce (paying some)
Philips	Reports, data, check machines, improved services, structures, patient increase, renovations, worked on maternity, train CHV, installed electricity, brought (test) machines, drill borehole, brought water, solar, backpacks (doing minor screening, BP), innovated the facility, trying to improve on record keeping, providing internet, sort problems in the facility, good and enough water Philips would give 'ambulance, theatre, drugs, more doctors, physiotherapy machines' (but did not happen)
Linda Mama	Linda Mama program (except one CHV said they don't use NHIF at the facility), data clerks
CHRIPS (NGO)	Managed in Nairobi University, CCC, employees (data, COs, testing), furniture
IPAS (NGO)	Youth, post-abortion care, ANC, mosquito nets
Community representatives	Meetings, work together with service providers, supervising how the CLC was built, work together with CHVs, bring someone to the hospital, go to meetings in the hospital, call nurse who works at the children's clinic when there is a problem in the community, take information to the community, handed over the land, elders committee deal with water
CHV	Monthly meeting to discuss what has happened in the community (former nurse in charge, the current one does not do this or talk to the CHV), mobilize special clinics in the CLC, connect people to the CLC, campaigned for the CLC in the beginning
G45 (Githurai 45)	Bought tanks, known for bills of the hospital. Runs water, pays for the bill (facility agreed to supply water to surroundings), sells water to community
KAPTELD (TB), Cheer up, Care for AIDS	
Collaboration partners CLC Dandu	Arrangements

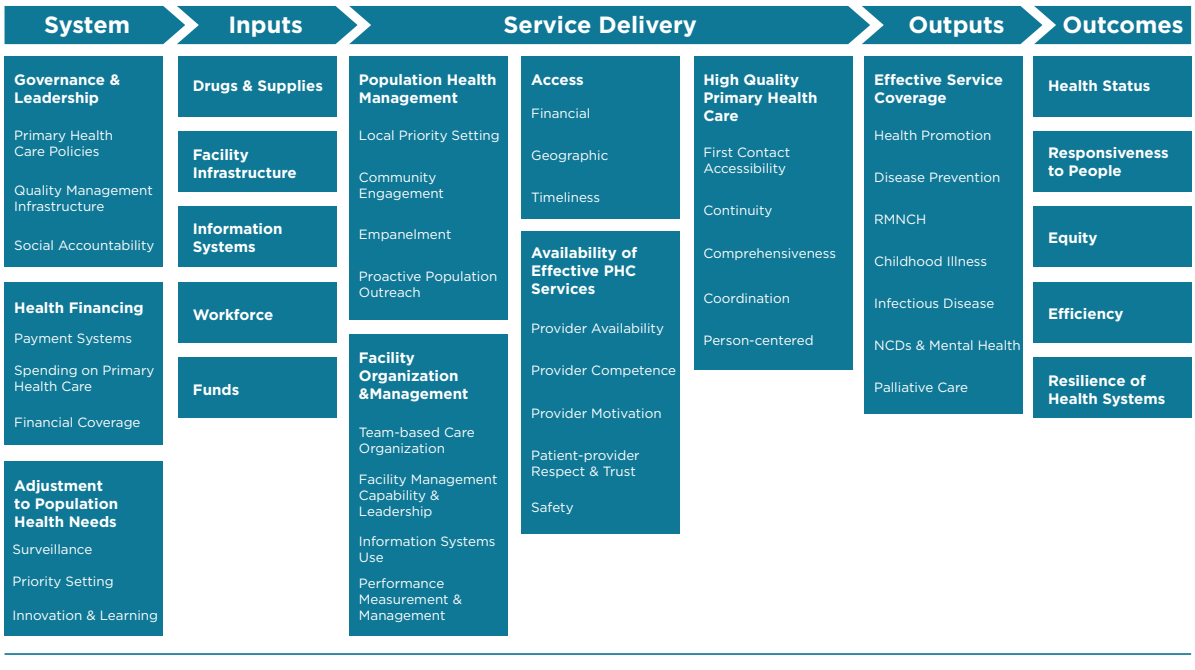
Philips	Meetings, provide backpacks, give essential commodities, helped equipping maternity centre, build laboratory room, repair broken machines, provide funds, reports
Save the Children	Give assistance, (used to) give training, provide logistics like vehicles
Danida (NGO)	Provide funds
County government	Give assistance, build maternity centre, support health education given by CLC
National government/Ministry of Health	Management of day-to-day activities
Community and religious leaders	Meetings

ANNEX 7 HEALTH SYSTEMS FRAMEWORKS: IHP+ AND PHCPI.

IHP+ Common Health Systems M&E framework (15)(16)



PHCPI Framework. (17)(18)



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