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# **A LOGIC MODEL FOR MEASURING THE IMPACT OF COMMUNITY HEALTH VOLUNTEERS**

**IN KENYA'S IMPLEMENTATION  
OF SDG 3 (GOOD HEALTH AND  
WELL-BEING)**



**Reimagining  
Volunteering**  
for the 2030 Agenda  
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**WORKING PAPER**

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# **A LOGIC MODEL FOR MEASURING THE IMPACT OF COMMUNITY HEALTH VOLUNTEERS IN KENYA'S IMPLEMENTATION OF SDG 3: ENSURING HEALTHY LIVES AND PROMOTING WELL- BEING FOR ALL AT ALL AGES**

**Tuesday Gichuki and Judy Gachathi**

In 2016, the Government of Kenya commissioned the authors of this paper through Usitawi Consultants Africa Ltd., to undertake the first ever study to quantify the contribution of volunteer work to Kenya's economy, with a view of encouraging the Bureau of Statistics to include measurement of volunteer work in national surveys and the System of National Accounts. This paper attempts to provide a framework for moving beyond quantification of volunteer work to measurement of volunteer impact. The authors propose a logic model for credible, replicable and scalable methodologies that can be used to measure the impact of the work of community health volunteers (CHVs) on improving health outcomes at population level in line with Sustainable Development Goal (SDG) 3 – Ensuring healthy lives and promoting well-being for all at all ages.

Community health volunteers are lay community members who serve as a liaison between the community and the health care, government and social services systems. They work mainly in underprivileged, marginalized communities where resources are limited or there is a lack of access to quality healthcare. CHVs provide advocacy, education and support to civilians in order to help them improve their lifestyle and connect them with their proper healthcare options, as well as collecting data and discussing health concerns with specific populations. They often live in the communities where they serve.

In Kenya, CHVs offer services touching on seven of the nine targets of SDG 3, specifically targets:

- 3.1 reducing maternal mortality;
- 3.2 ending preventable deaths of new-born and children under 5;
- 3.3 ending the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combatting hepatitis, water-borne diseases and other communicable diseases;
- 3.4 reducing premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being;
- 3.5 strengthening the prevention and treatment of substance abuse;
- 3.6 reducing the number of deaths and injuries from road traffic accidents; and
- 3.7 ensuring universal access to sexual and reproductive health-care services, and the integration of reproductive health into national strategies and programmes.<sup>1</sup>

## **Methodology**

This paper was prepared through a review of articles, reports, and global data collection tools to identify key measurement domains in monitoring the performance and impact of CHVs. A limited number of online key informant interviews were conducted with stakeholders, community health implementers, advocates and Ministry of Health representatives.

However, due to the prevailing COVID-19 challenges, we were not able to contact a number of critical stakeholders to conduct consultations to build consensus on priority indicators, identify the importance and value of specific measurement domains, sub-domains, and indicators.

It is anticipated that the proposed logic model can be used in a pilot survey to measure the impact of CHV interventions in Nairobi County, and adjustments to the model be made on the basis of the findings.

## Defining volunteerism in Kenya

The idea of giving of oneself for the benefit of others has its origins in early African associational life, which had a strong normative and moral basis. Traditional African cultural beliefs and practices encouraged collective responsibility, solidarity and reciprocity. These ideas were fundamental to expressing an individual's humanity through social relations with others, an idea which was fundamental to the social cohesion of pre-colonial societies that relied on mutual aid, kinship and community support to meet human needs.<sup>2</sup>

The current definition of volunteer work is found in paragraphs 37 and 38 of the Resolution concerning statistics of work, employment and labour underutilization, adopted by the 19<sup>th</sup> International Conference of Labour Statisticians (ICLS).<sup>3</sup> Volunteers are defined as persons of working age who, during a short reference period (at least one hour), performed any unpaid, non-compulsory activity to produce goods or provide services for others. Although "unpaid" is interpreted as the absence of remuneration in cash or in kind for work done or hours worked, volunteer workers may receive some small form of support or stipend in cash, when below one third of local market wages (e.g. for out-of-pocket expenses or to cover living expenses incurred for the activity), or in kind (e.g. meals, transportation, symbolic gifts).

Kenya national volunteerism policy defines volunteerism as *"the offering of an individual's or group's time, skills or resources to provide services by free choice for the benefit of other individuals, communities or nations, without the expectation of financial gain other than reimbursement of reasonable expenses."*<sup>4</sup> The definition does not limit who the beneficiaries are, which in effect could include members of the volunteer's family.

Like the international definition, the Kenya policy recognizes reimbursement of costs such as meals, transport and out-of-pocket expenses, while differentiating these from actual remuneration. The policy recognizes youth, retired persons, working professionals, citizens living abroad, organized groups, corporates, children in institutional settings, and government volunteer initiatives.<sup>5</sup>

The Kenyan policy includes four categories of volunteering; mutual aid, service, campaigning, and participation,<sup>6</sup> but does not include **volunteering as leisure**<sup>7</sup> which is included in the updated UNV categories of volunteerism to account for volunteer work done to express one's interests and better recognize the benefit of volunteering to the volunteers.

## State of volunteerism in Kenya

The Kenya Vision 2030, the Second Medium Term Plan (MTP II) and the Government's Social Economic Development Agenda consider volunteerism as a critical national asset to facilitate Kenya's attainment of its socio-economic goals; including the Millennium Development Goals and their successor, the 2030 Agenda for Sustainable and the Sustainable Development Goals.

In Kenya, volunteerism has been practiced both informally and formally. Volunteers derive certain benefits from their volunteering activities by acquiring skills, knowledge, motivation, and enhancement of their networks. The act is carried out by youth and women, retired professionals, active professionals, persons with disabilities (PWDs) among others. The volunteerism sector

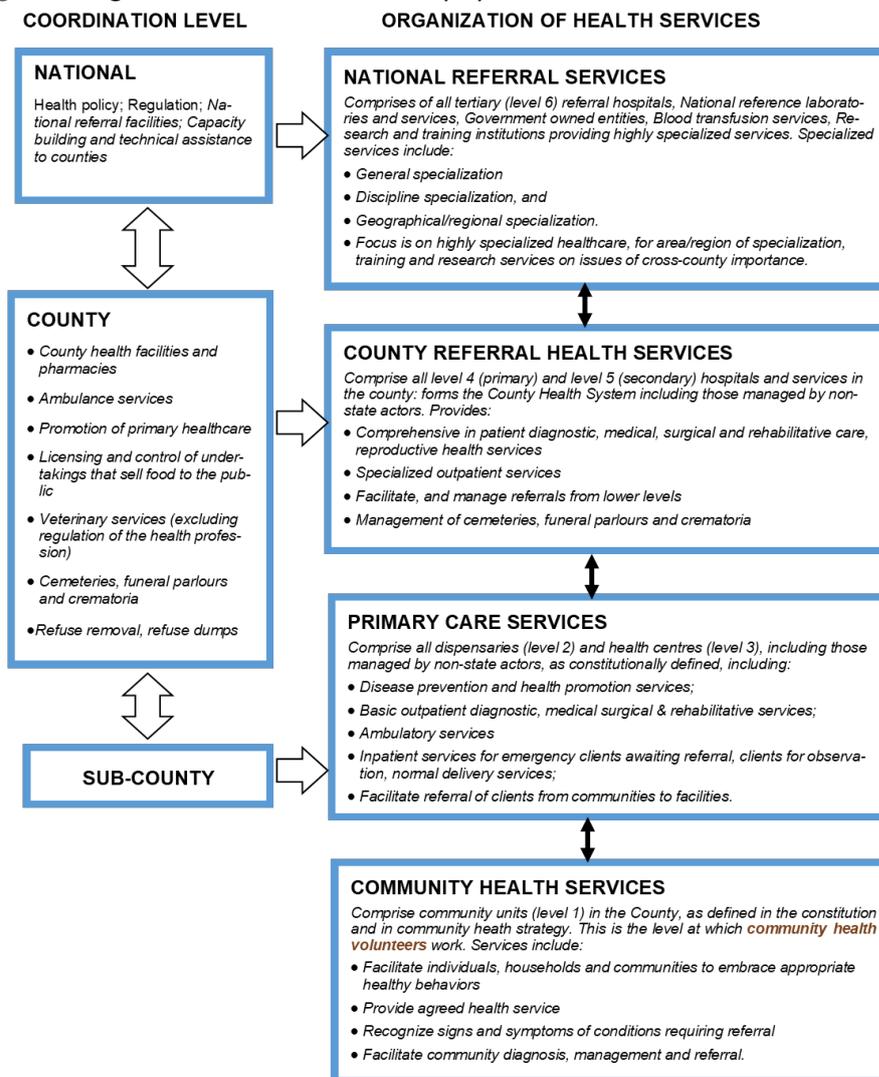
continues to grow with emerging trends. Such sectors include Government initiated volunteer programmes.<sup>8</sup>

Research carried out in 2017, by the authors of this paper, on behalf of the government of Kenya found that 51 percent Kenyans volunteered in 2016. Age, education level or marital status did not appear to be a constraint in ability to volunteer. Slightly more men (55.4 percent) than women (44.6 percent) volunteered during the reference period. The economic contribution of volunteer work to the economy was approximately 4 percent of the GDP.<sup>9</sup>

## Kenya's health situation

The Government of Kenya has identified 100 per cent achievement of Universal Health Coverage (UHC) as one of its four priority agenda during the period 2018-22. This includes increasing the population covered by health insurance from 36 per cent (2017) to 100 per cent (2022); reducing the out of pocket household expenditure from 26 per cent in 2017 to 10 per cent by 2022; increasing the population having access to a defined essential health services package and strengthening coordination among health sector stakeholders for attainment of UHC.<sup>10</sup>

Figure 1 Organization of Health Delivery System



Source: GOK, Kenya Health Policy 2014–2030

## Government of Kenya policy projections

The Health Act, 2017 establishes a unified health system, to coordinate the inter-relationship between the national government and county government health systems and to provide for regulation of health care service and health care service providers, health products and health technologies.<sup>11</sup>

The Kenya Health Policy 2014–2030 seeks to ensure a significant reduction in the general ill health in the Kenyan population by achieving reductions in deaths due to communicable diseases by at least 48 per cent and reducing deaths due to non-communicable conditions and injuries without losing focus on emerging conditions.

Table 1 Absolute and Relative Mortality Targets for Kenya, 2010-2030

	2010		2030 Targets	
	Absolute No. of Deaths	Deaths per 1,000 Persons	Absolute No. of Deaths	Deaths per 1,000 Persons
<b>Total</b>	<b>420,000</b>	<b>10.6</b>	<b>290,000</b>	<b>5.4</b>
Communicable conditions	270,000	6.8	140,000	2.6
Non-communicable conditions	110,000	2.8	110,000	2.0
Violence/injuries	40,000	1.0	40,000	0.7
<b>Population estimates</b>	<b>38,500,000</b>		<b>54,150,000</b>	

Source: Projections by Ministry of Health

## Health sector financial allocations and expenditure

Evidence from the 2010 National Health Accounts demonstrated improvements in allocative efficiencies, with more services provided using the same amounts of resources in real terms. However, more resources were spent on management functions than on service delivery. Improvements in real terms were notable only in the last two years of the policy period (2009 and 2010). Now that health has been included as a basic right in the Constitution, it is expected that the level of investments will increase to meet this obligation.<sup>12</sup>

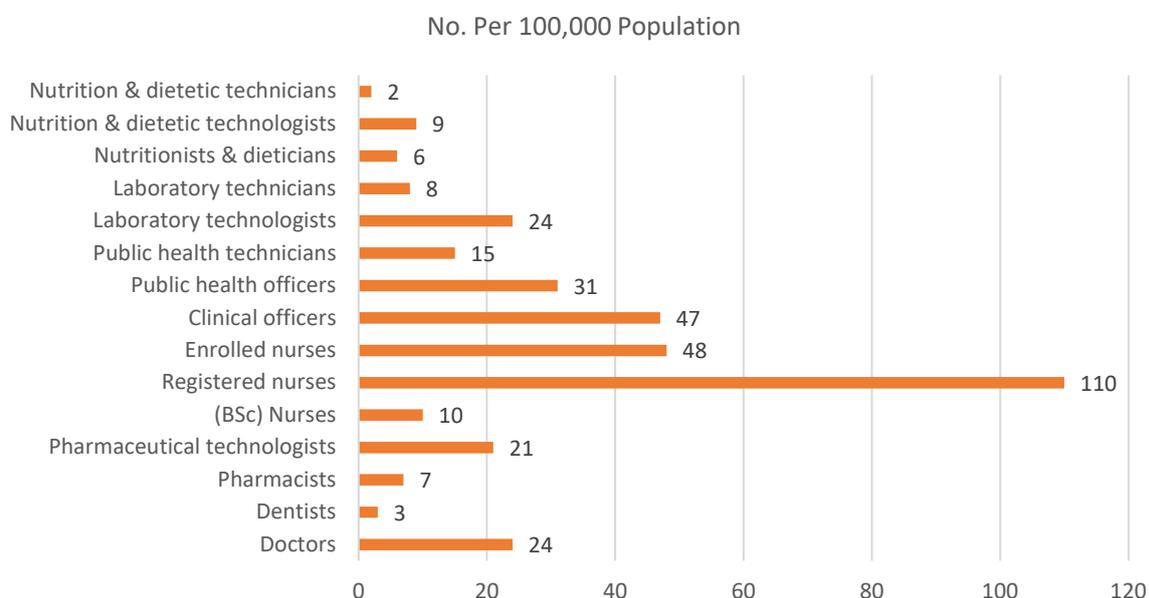
## Human resources

Table 2.2 shows a general increase in the number of healthcare professionals over the years to peak to an average of 24 doctors and 168 nurses for every 100,000 persons by 2018.<sup>13</sup> Kenya's community health strategy includes community health volunteers (CHVs), who are members of the community, nominated from within, and tasked with improving the community's health, well-being and linking individuals to primary health care services<sup>14</sup>. CHVs conduct monthly household visits within a defined catchment area of 20 households in rural areas and 100 households in urban areas. With Kenya's average household size being 3.9<sup>15</sup>, Kenya then needs 1,282 CHVs per 100,000 population in rural areas and 356 CHVs per 100,000 population in urban areas.

During routine household visits, CHVs collect basic health information and identify health problems that require engagement with the formal health sector. The national CHV manual<sup>16</sup> outlines fourteen additional responsibilities, which are integrated in multiple ways into their routine work, and the Ministry of Health supported behaviour change initiatives.

The Ministry of Health (MOH) provides a 10-day basic training before CHVs are deployed. This basic training is supplemented by activity specific technical training, implemented by local governments or NGOs using MOH guidelines. CHVs are also trained, coached, and supervised by community health extension workers (CHEWs), who are salaried frontline health care workers.<sup>17</sup>

Figure 2 Registered Health Professionals in Kenya (2018)



Source: Kenya Economic Survey 2019

## A conceptual framework for measuring impact

Assessing the effectiveness and impact of health programmes on the health of populations in general is a challenging task. It is difficult to attribute any improvements to one or more health programme activities. Many contextual factors contribute to the health of populations, including non-health programme factors such as the standard of living, level of education, and so forth.

Another difficulty is that different evaluation actors and stakeholders may view impact quite differently. The impact may be viewed in the light of effects intended by policy makers and programme planners or as experienced by intended beneficiaries and others. It may also be a review of an immediate experience or a more enduring change in circumstances, capacities, at the level of individuals, communities or institutions.

In this paper, measurement of the impact relates to the long-term positive changes, for policy makers, individuals, communities, and society as a whole, resulting from activities or services provided by CHVs and the health delivery system as a whole. The paper seeks to build a model for measurement, able to respond to the following questions:

1. What are the main health issues addressed by CHVs and who do they affect?
2. Did the CHVs intervention make a difference in the short, medium-term health changes (outcomes) and long-term results (impacts)?
3. To what extent can a specific impact be attributed to CHVs activities? Would the outcomes be different without CHV interventions?
4. Does the programme affect different people in different ways (by gender, wealth, class, ethnicity, religion)?

## 5. Are the interventions scalable and replicable elsewhere?

Currently, there is no universal, standardized system for empirically measuring the impact of CHV programmes.<sup>18</sup> Measurement is limited by lack of an accepted and pragmatic set of theoretically grounded and validated indicators<sup>19</sup>. The integrated Community Case Management (iCCM) Framework attempts to provide guidance on measurement and metrics; however, it has few metrics measured at the community level.<sup>20</sup>

The framework proposed in here has been developed after a review of community health literature partly identified by Aggarwal et al and online databases. The frameworks reviewed include the community health worker assessment and Improvement Matrix (CHV AIM)<sup>21</sup>, CHW logic model proposed by Naimoli et al<sup>22</sup>, USAID Community Health Framework<sup>23</sup>, and the Primary Health Care Performance Initiative (PHCPI) conceptual framework<sup>24</sup>. Reviewing the literature and existing frameworks helped identify and define sub-domains of the Community Health Volunteer Impact Measurement Framework. This was refined through key informants with expert knowledge of the community health volunteer landscape in Kenya.

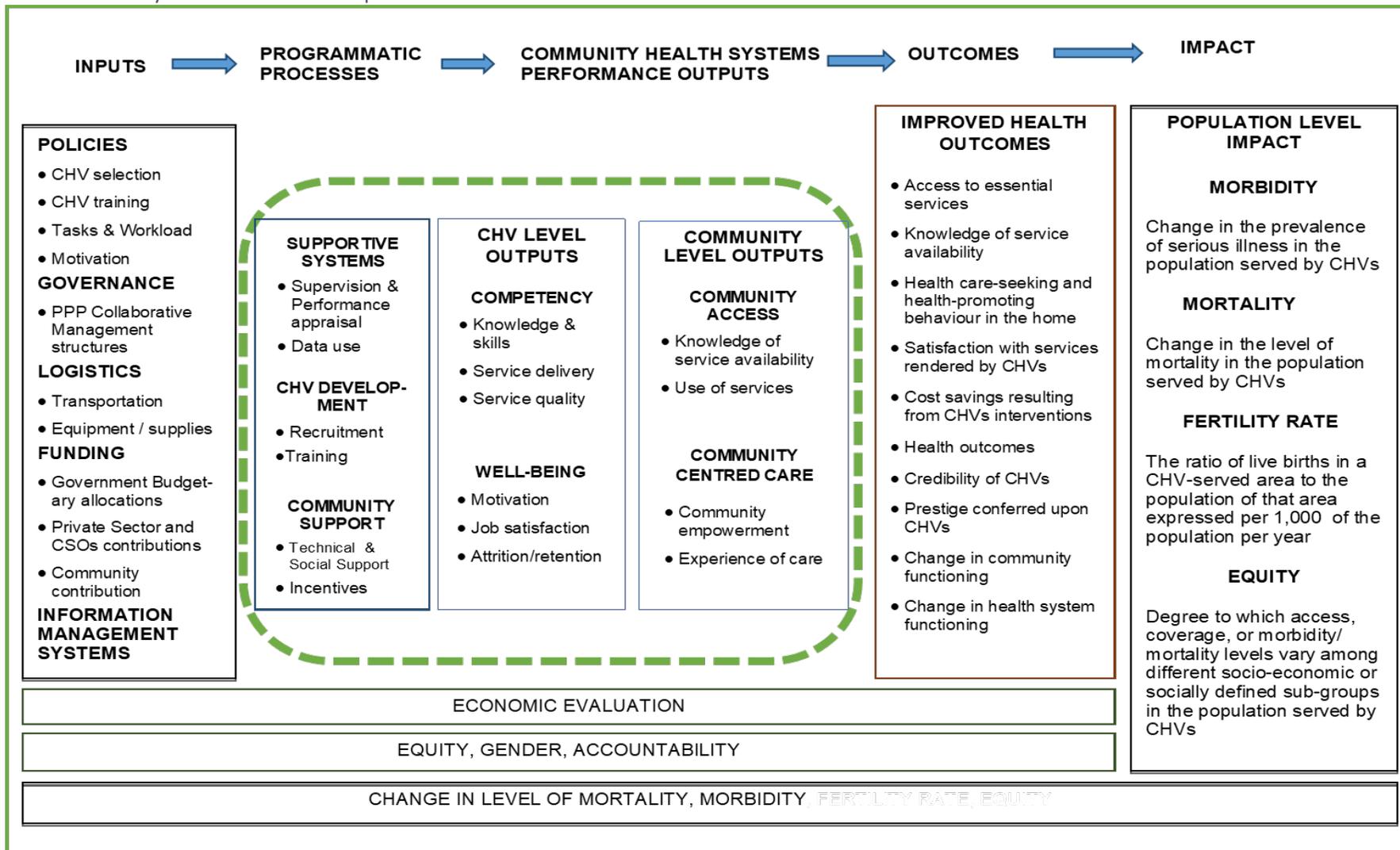
### Concept development

The proposed measurement framework involves the following critical considerations:

- Programme and system-level processes and activities, including the role of governance, policy, internal and external investments, and other supportive mechanisms which account for the broader community health system influencing CHV programme performance.
- CHV programmes implemented by Civil Society Organizations and the private sector, with divergent CHV roles, responsibilities, and timelines. A private public partnership should coordinate these diverse actors, using existing standardized metrics (iCCM, HIV, TB, family planning, maternal health) to measure downstream impacts of services on a specific outcome area.
- While several factors contribute to the success of CHV programmes, the proposed indicators around the framework focus on aspects that are amenable to and critical for the purposes of measurement of CHV impact. The paper does not include multidimensional and critical concepts such as community empowerment and job satisfaction.
- Balance short-term demand for data to inform programmatic activities with the long-term data needed to understand programme effectiveness.

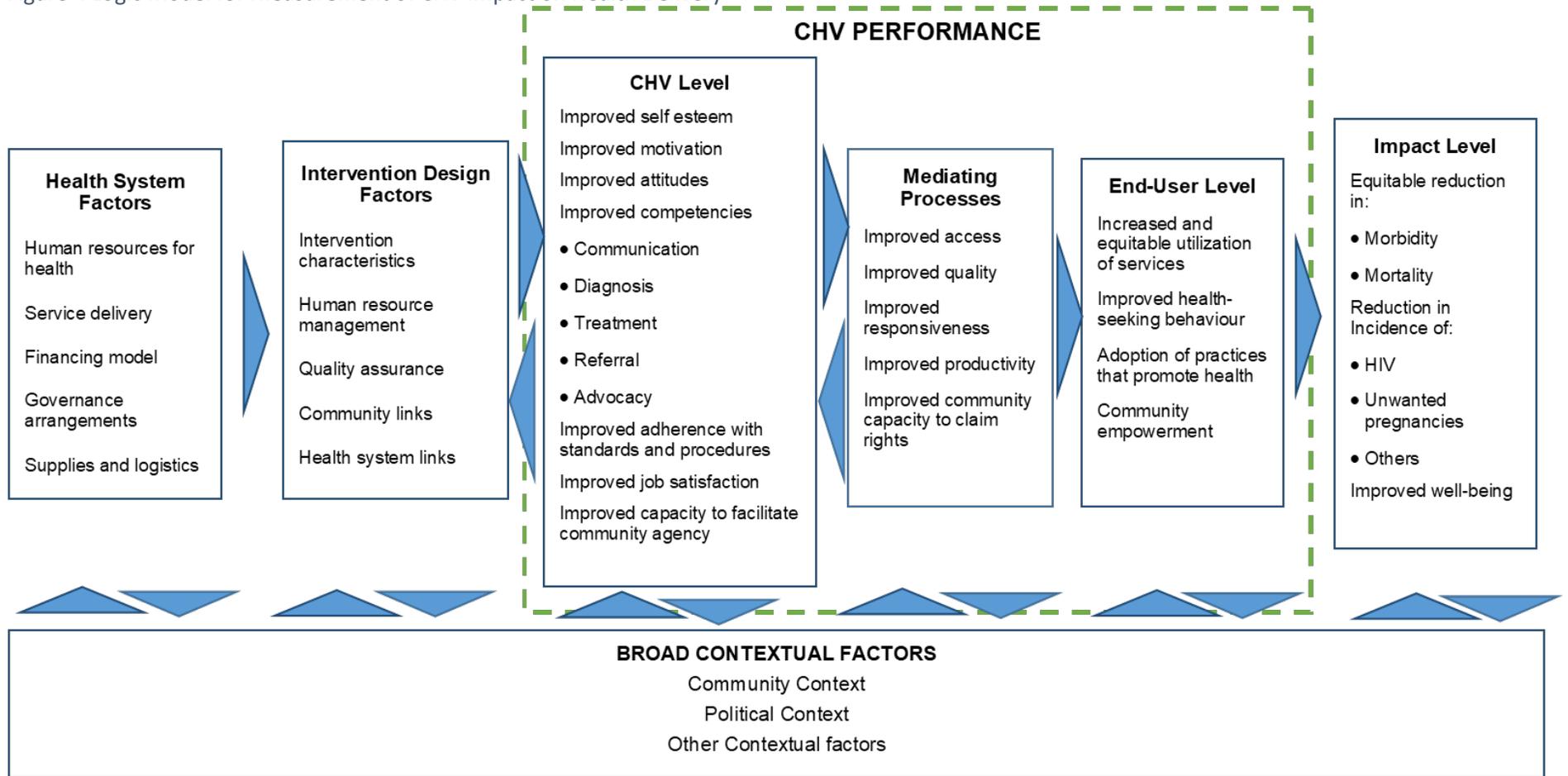
The impact measurement framework shown in Figure 3 and indicators are a critical first step in identifying relevant and contextually appropriate indicators to monitor the performance and impact of CHV programmes. Adoption of the proposed indicators can guide the development of a robust monitoring system for CHV programmes, help improve day-to-day performance, and in the long run, impact on health outcomes. However, systems and resources to capture and utilize data at community level face greater practical challenges than at the facility level.

Figure 3 Community health volunteers impact measurement framework



Source: Authors based on Agarwal et al, 2019

Figure 4 Logic Model for Measurement of CHV impact on Health Delivery



Source: Authors based on Maryse C Kok, Marjolein Dieleman, et al. 2014

## Measuring impact of community health volunteers

In order to measure the impact of community health volunteers, it is necessary to show that change in health outcomes results from the volunteer programme intervention and not from other healthcare interventions or factors. Monitoring and process evaluations are essential prerequisites for impact evaluation. Monitoring measures the outputs produced by an intervention, and process evaluation assesses whether all the steps of the programme are properly executed and whether there are bottlenecks or impediments to successful implementation. Monitoring and process evaluation should be initiated from the beginning of the programme and continued throughout it to enable changes if problems in implementation arise.

Table 2 Evaluation methodologies and techniques

Evaluation Design	Methodology	Advantages/Disadvantages
Experimental Designs	Beneficiary and control groups are randomly selected from a well-defined population. When designed with a large enough sample size and controlled to prevent or limit influence from outside factors, any observed difference in the outcomes between the beneficiary and control groups can be safely attributed to the intervention and not to underlying differences between the two groups.	<ul style="list-style-type: none"> <li>• The main benefit of this technique is the comparative simplicity of constructing the counterfactual and interpreting the results.</li> <li>• Challenges include ethical concerns (denying benefits or services to otherwise eligible individuals), difficulty in offering the intervention to only certain groups, a high cost and time requirement and an inapplicability to pilots and other programme models.</li> </ul>
Quasi-experimental Designs	Control groups are not randomly chosen, but selected so that they closely resemble the beneficiary group. In this case, beneficiaries are compared to the control group using complex statistical methods to account for the differences between the groups and correct for the selection bias that may arise from non-random allocation of benefits.	<ul style="list-style-type: none"> <li>• The main benefit is that they can draw on existing data sources and are thus often quicker and cheaper to implement than randomized designs. They can also be performed after a programme has been implemented, provided that sufficient data exists.</li> <li>• A major challenge is selection bias, arising from non-random assignment. It is possible that some of the characteristics determining assignment to beneficiary or control groups might also influence final outcomes.</li> <li>• They may not indicate what would have happened to the beneficiaries if they had not received the intervention, or account for unrelated non-intervention changes. The reliability of results depends on a set of assumptions and fairly complex statistical methods.</li> </ul>
Non-Experimental Designs	Beneficiaries are compared with the control group using statistical methods to account for the differences between the groups. Some non-experimental evaluation methods do not establish control/comparison groups but use other sophisticated techniques to attempt to demonstrate causality.	<ul style="list-style-type: none"> <li>• The main benefit is that they take into account the complexity of the programme and the context within which it operates.</li> <li>• They offer a more flexible and low-cost technique that can be applied in situations where experimental or quasi-experimental techniques are not appropriate or possible.</li> <li>• The information they provide is complex and difficult to analyse differentially and to generalize from.</li> <li>• There is also some debate about the validity of these evaluations, since they may not rigorously establish causality nor explicitly determine the standard against which impact is to be defined and measured..</li> </ul>

Source: Authors based on Elliot Stern (2015)

## Establishing causality in measuring impact

When measuring impact of an intervention, one needs to demonstrate that the observed change is due to the intervention, and not to other factors. This usually requires an explicit *counterfactual*; an estimate of what would have happened to the beneficiaries if the intervention had not taken place. Since it is not possible to observe the same individual over time both with and without the intervention, there is need to identify a representative comparison or control group. This is a set of individuals or families who are like the beneficiary group in every way, except that they were not subject to the intervention. This helps us to establish whether the observed change is solely due to the intervention outcomes. It is also necessary to assess contribution of interventions done by paid health workers and non-state actors within the population under evaluation.

### Choosing the right methods

There is no one “gold standard” for evaluating impact, but instead “methodological diversity and appropriateness in support of rigour” are of main importance (*Network of Networks on Impact Evaluation*). Each impact evaluation takes into account the specific programme’s unique characteristics and environment. The impact evaluation should demonstrate causality - a credible demonstration that the intervention was responsible for the observed outcome in an empirically verifiable and objective manner. Casual Contribution assesses whether or not the programme is one of many causes of the observed change and develops testable hypotheses and predictions telling a credible story regarding how an intervention affects its intended results. This outcome must be defined relative to an explicit counterfactual, to which outcomes of the programme can be compared.

In our view, the most robust methodology to establish the counterfactual to facilitate measuring the impact of community health volunteers, is using an experimental approach, randomly selecting individuals served by CHVs (beneficiary group) and those not served by CHVs(control group). A mixed methods approach, combining qualitative and quantitative methods, can provide comprehensive results, combining well contextualized studies with quantitative rigour. Using a mix of quantitative and qualitative data sources (e.g. administrative data and self-reported data), types of data (quantitative vs. qualitative), sampling methods (random and purposeful), measurement instrument (e.g. questionnaire and interview) and analysis methods (e.g. statistics and interpretation) to complement and balance each other, strengthens the quality of evidence and can provide a confirmation of results obtained through each method independently.<sup>1</sup>

### Determining sample size

Ideally, and especially for national level evaluations, power calculations need to be performed to determine the sample size that is sufficient for finding statistically significant intervention effects. If the sample size is too small then the study is “underpowered,” with the risk that the study will not find a significant impact even though there is one. Too large a sample means that the study budget will be larger than it need be. Power calculations should be independently carried out by someone with the necessary statistical skills.

In this model, we propose that evaluators use the Cochran formula to calculate sample size, as it is easy to use by organizations and people with minimal statistical expertise, to enable scalability and replicability. The formula allows you to calculate an ideal sample size given a desired level of precision, desired confidence level, and the estimated proportion of the attribute present in the population. Cochran’s formula is considered especially appropriate in situations with large populations. The formula provides a ‘correction’ through which the number given by Cochran’s formula can be reduced if the whole population is relatively small. Where the population is unknown, the sample size can be derived by computing the minimum sample size required by considering the standard normal

deviation set at 95 per cent confidence level (1.96), percentage picking a choice or response (50 per cent = 0.5) and the confidence interval (0.05 = ±5).

## Data collection

Evaluators will need to collect primary data for impact measurement over two different time horizons (baseline and end-term), through structured questionnaires embedded into the cross-sectional survey and budgetary reviews. Qualitative data can be collected through focus group discussions (FGDs) and key informant interviews (KIIs) with women, youth, household decision makers, CHVs and CHEWs, care providers at facility and community levels and county level health decision makers. Secondary data will mainly be collected through literature review, including CHV supervisory records and the most recent Demographic and Health Surveys (DHS).

## Gender roles and norms in volunteer work and implications for design

Gender roles and norms, which intersect with social and cultural norms, influence women's access to and uptake of CHV services and thereby CHV programme performance. For example, in Swaziland, limitations on women's agency and decision-making formed a barrier in access to HIV prevention and care interventions by CHVs.<sup>2</sup> This model holds the potential to add insight into gender roles and norms in volunteer work.

A CHV intervention in Malawi on prevention of mother-to-child transmission of HIV found that women without any partner involvement were most likely to complete treatment. Those women with involved but undisclosed partners were least likely to complete treatment.<sup>3</sup> In Afghanistan, Viswanathan et al. reported a preference for female CHVs for the delivery of reproductive health services compared to male CHVs, because cultural norms do not allow men and women to interact freely outside the family.<sup>4</sup>

Hill et al. suggested that having only male community-based surveillance volunteers (CBSVs) working in maternal and neonatal health in Ghana might have limited the scope of the intervention, as families would not allow the male volunteers to physically help putting babies in the skin to skin position or help with breastfeeding attachment.<sup>5</sup> A family planning programme in Guinea recruited a female and male Community Based Distributors (CBDs) per village, because social norms allowed only female CBDs to approach women, while male CBDs would engage with men.<sup>6</sup>

A study in Western Kenya, found that male CHVs had a more difficult time providing voluntary services as it strained their ability to fulfil their household financial responsibilities. Consequently, they dropped out of volunteer programmes to search for income generating endeavours. Women CHVs were prepared to continue their work, despite the lack of a realistic wage. The women CHVs' continued willingness to take on the role despite the lack of a realistic wage reflects a gendering of particular social processes, with responsibility for family and community healthcare being "naturally" assumed by women as an extension of their maternal role, contributing the perspective of the uneven and gendered geographies of volunteerism<sup>7</sup>.

The study also found that men lacked certain characteristics like instinct for tender care and tolerance that a sick person requires compared to female CHVs who took it as "their natural duty". Although remuneration was not as strong a condition for women to become a CHV, lack of a realistic wage and sometimes lack of spousal support played a role in women dropping out of volunteer programmes.<sup>8</sup>

Rose Evalyne Aseyo, et al, found evidence that both men and women CHVs felt certain issues should only be discussed with either men or women. Many male CHVs were uncomfortable to directly address pregnancy as they found it a culturally inappropriate topic for them. Women CHVs found it a

difficult topic to openly discuss sexual and reproductive health issues with men. They also found it difficult to visit male households, especially unmarried men, due to concerns of safety and the negative impact on their reputation. Young men, on the other hand, reported facing difficulties in conducting household visits as they were often suspected of having ulterior (possibly criminal) motives.<sup>9</sup>

The above limitations reflect a gendered view of data collected, possibly impacting on its quality, accuracy, completeness, reliability and confidentiality. The gendered norms also limit the ability to openly discuss important health issues and fully assess the health status of their clients. This may be overcome through sensitization of beneficiary communities and recruitment of more men and women as CHVs.

### Logic model for measurement of community health volunteers' impact

Funnell and Rogers define a logic model, also called a programme theory as, *“an explicit theory or model of how an intervention, such as a project, a programme, a strategy, an initiative, or a policy contributes to a chain of intermediate results and finally to the intended or observed outcomes”*<sup>10</sup>. A logic model maps the intended relationships and causal connections between what a programme plans to do and what it hopes to achieve and commonly includes contextual factors that may positively or negatively influence a programme's implementation and the attainment of results<sup>11</sup>.

The Logic Model proposed in this paper (Figure 2.4), is derived from the CHV performance and impact framework (Figure 2.3) and represents our approach to measuring the impact of CHVs programming. It recognizes that the different contributions of both health sector and community actors to high quality CHV programming are necessary to attain and sustain CHV performance and impact at scale. Impact Measurement can aid planning decisions on funding the health sector at community level. It may also help to highlight the important role of community systems, which is a significant determinant of good CHV performance. The model may also contribute to consensus-building, facilitate communication among programme developers, researchers, policy makers, community representatives, and funders. Improved communication will help foster a shared understanding of the depth and breadth of what is needed to improve and sustain CHV performance.<sup>12</sup>

### Measurement of community health volunteers' performance

There are a number of factors that contribute to the performance and impact of CHV interventions. These include supportive supervisory systems, capacity of CHVs, community level support, CHVs competencies and well-being as well as community awareness of and access to services offered by CHVs. Data for some of the factors is easily available, while others are difficult to directly obtain. For example, trainings may capture pre and post-test knowledge scores, but efforts to assess the extent to which CHVs effectively apply their newly acquired skills are less frequently undertaken.<sup>13</sup> Measurement of financial and non-financial incentives provided to CHVs is a difficult area to routinely monitor, except in areas where CHVs receive a pre-determined stipend, captured through monthly reports. Non-financial incentives are more difficult to measure as they come in many forms, such as educational and promotional opportunities, or social recognition of the CHV by communities.<sup>14</sup>

Measuring community awareness of the presence and availability of CHVs services is critical to respond to community needs and priorities. This requires population-based study.<sup>15</sup> The quality of services should be measured both from the technical or clinical perspectives and the client's perspective. Timely and appropriate referral from the community to the health facility poses the challenge of identifying the appropriate number of clients eligible for referral per protocol. This may

be measured per 100 or “X” clients seen by the CHV, disaggregated by reason for referral and used for comparisons across settings or over time.<sup>16</sup>

### Measurement of the economic impact

Economic evaluation is the comparative analysis of alternative courses of action in terms of both costs and consequences in order to assist policy decisions. It can play a pivotal role in priority setting and inform healthcare decision makers with evidence relevant to resource allocation.<sup>17</sup> The World Health Organization (WHO) strongly recommends cost-effective interventions as a key aspect of achieving Millennium Development Goals.

Cost-effectiveness analysis measures the consequences of different interventions using a single outcome, usually in ‘natural’ units (such as, life years gained, deaths avoided, heart attacks avoided or cases detected). Alternative interventions are then compared in terms of cost per unit of effectiveness. It is a tool decision-makers can use to assess and potentially improve the performance of their health systems. The main drawback to this method is that data regarding indirect costs such as a portion of administrative costs, the cost of equipment is usually not readily available. It does not facilitate comparisons across different diseases when different outcomes have been used. However, this method is easy to understand and more readily suited to decision making as it provides empirical results for the decision makers to compare the costs and consequences associated with alternative programmes.

In this paper we propose the use a mixed-design approach, i.e., cost-effectiveness analysis (CEA) and qualitative thematic analysis. The incremental cost-effectiveness ratio is calculated for healthcare system and societal perspectives, taking into account the country-specific model inputs (costs and outcome) from the CHV programmes.

The CEA takes into account both costs to healthcare system and cost to families of the beneficiaries. The standardized ingredient approach,<sup>18</sup> which involves gathering sufficient information about the quantities and unit cost of physical inputs needed in the intervention and control groups, is used to calculate costs.

- **Cost to the healthcare system.** The cost to the health system comprises the cost of the CHV interventions, including technology and infrastructure, equipment, community engagement sessions, training and time of healthcare providers at the community and health facility levels. Additional costs will include cost of follow-up household visits in each of the selected sites, cost of CHVs additional time and transport costs when accompanying any identified beneficiary to a referral health facility and health system costs such as managing triage for obstetric emergencies, in-patient/outpatient services for obstetric emergencies, as well as diagnostic tests and drugs.
- **Cost to the family.** All relevant out-of-pocket (OOP) expenses for ambulance, hospitalization (doctor’s fees, bed charges, nursing services), drugs and diagnostic workup related to care from the referral health facility should be included. Also, OOP cost for informal care (i.e. care sought from traditional healers) may be captured, as well as the cost of lost productivity resulting from morbidity or mortality of patients with or without paid jobs, and any lost wages of their caregivers.
- **Cost to society.** The total societal costs (i.e. combining of costs to the healthcare system and cost to the family) will be calculated by summing across all cost categories.

- **Health resource utilization and costs data collection.** The information about resources utilized and unit costs is collected from primary and secondary data sources in the beneficiary and control groups. Structured health resource utilization questionnaires are administered to both beneficiary and control groups.

To assess the cost-effectiveness of the CHV intervention, the costs and outcomes associated with each arm of the CHV intervention are compared to generate an incremental cost-effectiveness ratio (ICER). The ICER is the difference in costs between the beneficiary and control groups, divided by the difference in the number of interventions completed between the two groups. The ICER represents the additional cost per intervention in the beneficiary group in comparison with those in the control group. The costs and intervention outcomes are then evaluated over two different time horizons (baseline and end-term) to present one ICER that includes research and development costs and another separate ICER that does not include these costs. Including research and development costs could be meaningful to organizations that may seek to develop a similar program but for a different population.

### Measurement of impact on health outcomes

Health is more than the absence of disease; it is a resource that allows people to realize their aspirations, satisfy their needs and to cope with the environment in order to live a long, productive, and fruitful life.<sup>19</sup> Health impact is the change in the individual's and the community's state of illness, wellness and survival. Some of the indicators (for both beneficiary and control groups) to measure the health impact in the areas covered by CHVs interventions include:

- per cent change in rate of maternal mortality
- per cent change in the rate of preventable deaths of new-born and children under 5
- per cent change in prevalence of AIDS, tuberculosis, malaria and neglected tropical diseases, hepatitis, water-borne diseases and other communicable diseases
- per cent change in the rate of premature mortality from non-communicable diseases
- per cent change in rate of substance abuse (narcotics and alcohol abuse)
- per cent change in the number of deaths and injuries from road traffic accidents
- per cent change in universal access to sexual and reproductive health-care services, including for family planning, information and education services.

### Measurement of impact on neonatal, infant, child and maternal mortality

Community health volunteers undertake case management of childhood illnesses and delivery of preventive interventions such as immunization, promotion of healthy behaviour, and mobilization of communities. CHVs also identify pregnant women, provide health education and screen for health conditions that require a referral to a higher level of care. They therefore have a bearing on the performance on neonatal, infant mortality, under-5 mortality and maternal mortality.

In the absence of complete and accurate prospective systems of data collection, the main methods of collection of child death information are based on questions in surveys about recent deaths in the household, or on complete and summary birth histories. This data is supplemented with the most recent data from Demographic and Health Surveys (DHS).

There is no consensus about how to measure Maternal Mortality Rate in the absence of complete registration of deaths and accurate ascertainment of cause of death (COD). We propose comparing estimates of pregnancy-related deaths and maternal mortality from three different household survey measurement approaches: a module collecting information on deaths of respondents' sisters,

collection of information about recent household deaths with a time-of-death definition of maternal deaths and a verbal autopsy instrument to identify maternal deaths<sup>20</sup>.

The change in Mortality Rates for both the beneficiary group and control group is then evaluated over two different time horizons (baseline and end-term). The difference between the Mortality Rates in the beneficiary group and that of the control group will measure the impact of CHV interventions.

#### Measurement of Impact on individual behaviour change

CHVs provide advocacy, education and support in order to promote health by assisting individuals and communities to adopt healthy behaviours. Human behaviour is hard to predict and the only way to know whether people are practicing the new behaviours is to measure them. Measuring impact of CHVs in behaviour change can be done using a mix of qualitative and quantitative methods. The focus should be on collecting data for the indicators included in CHV programme log frame.

Some of the indicators to be considered include the quality of activity implementation, preferably by using observation-based checklists, the extent to which the beneficiary and control groups practice the desired behaviours and the most important pre-conditions for practicing and sustaining the promoted behaviours.

Impact is measured by comparing the percentage of beneficiary group members and control group members who practice the promoted behaviours evaluated at the baseline and end-term timelines.

#### Measurement of impact of the volunteer experience on the community health volunteer

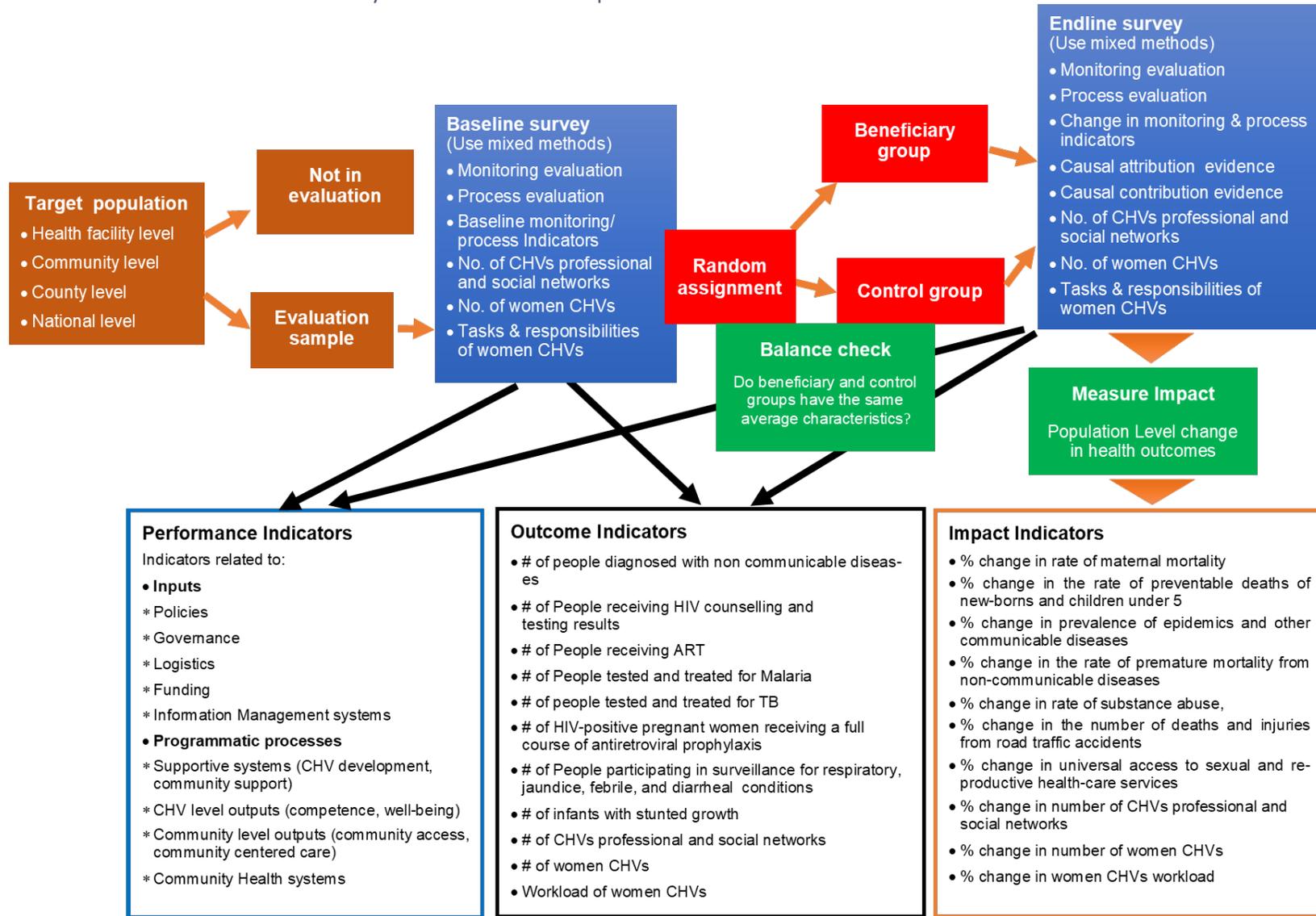
Volunteering has a positive impact on both the beneficiary and the volunteers themselves. Improved self-esteem, wellbeing, and social engagement for both the recipient and volunteer are widely cited.<sup>21</sup> Volunteering provides roles and ties which lead to improved social integration, life skills and social engagement,<sup>22</sup> as well as helping to develop skills, connections and networks, avoid boredom, keep fit and healthy, make new friendships, have a more positive sense of self-worth, and an improved sense of community.<sup>23</sup> Other benefits include progression into paid roles or professional qualifications that stem from volunteering, particularly when training is offered as part of the volunteering package.<sup>24</sup>

The following are indicative factors to be measured in both baseline and end-term surveys:

- per cent change in CHVs professional and social networks
- per cent change in number of CHVs who transition into paid employment
- per cent change in number of CHVs who have developed professional skills and are confident in their abilities to deliver basic healthcare services
- per cent change in number of CHVs who express satisfaction with support and recognition they receive from the community.
- per cent change in number of CHVs who express satisfaction with the support and recognition they receive from health facility staff
- per cent change in number of women who volunteer in the CHV programmes
- per cent change in the workload of women CHVs.

The impact is the difference over two different time horizons (baseline and end-term) for the above and other indicators.

Figure 5 Process of Measurement of Community Health Volunteers' Impact



Source: Authors

## Conclusion

There is currently no robust evidence base for developing a definitive causal pathway to improved CHV performance and impact. However, the importance of CHV performance and impact in today's results-oriented environment should spur further development of such pathways. The model suggests that highly functioning health and community systems enable and reinforce the work of CHVs, and offers the prospects of sustaining CHV performance and impact at scale. By examining both formal health and a sustainable community system support for CHVs in an integrated manner, the model highlights the multi-level and multi-dimensional challenges and complexity of enhancing CHV impact. It highlights the strengths and limits of targeted programming, reflecting the current state knowledge about support for improving CHV performance and impact. It also offers a framework to stimulate continuous learning about what works. It is critical to pay more attention to answering the question of how best to enhance CHV performance and impact at scale and to guide investment decisions of stakeholders to support sustainable health service delivery systems at community level.

## Challenges

The factors influencing CHV performance and impact are complex; any generic logic model will be an imperfect and oversimplified reflection of reality and at best a snapshot of that reality at a single point in time. For example, a generic model may not offer the precision needed to differentiate the performance determinants of CHVs working on HIV and AIDS from those of paid staff working on improving access to curative care. No single, generic logic model will be equally relevant to all countries: the genesis, purpose, evolution, and complexity of CHV programmes around the world can differ substantially from one country to another. Furthermore, the inputs and activities required to sustain a fully functioning programme will vary in type, mix, intensity, and sequence across countries. Therefore, generic models must be adapted to local conditions and evolve as circumstances change.

Furthermore, gender and cultural norms appear to play a significant role in the performance of CHVs, a factor which could be better integrated into future iterations of this model. For example, male CHVs said that pregnancy was an uncomfortable and culturally inappropriate topic for them to directly address, while women CHVs found it a difficult topic to openly discuss sexual and reproductive health issues with men. It is worthwhile to note that women CHVs still have to shoulder their responsibilities for family and community healthcare. It is therefore important to encourage both men and women to volunteer in sufficient numbers to overcome the identified gender sensitive challenges. It is also important to take into consideration the women's overall workload when assigning duties and responsibilities.

## Limitations

Although use of the model can inform programming, by itself it is not an adequate programme planning tool. A "logical framework" is a natural extension of the logic model, as it magnifies the logic model by integrating indicators and targets and the means for measuring progress<sup>1</sup>. The additive components of a log frame make it an indispensable complementary management tool for programme planning, monitoring, and evaluation of CHV programmes. Likewise, the logic model is primarily descriptive, not explanatory. For the expected linkages it does propose, the logic model does not unpack the underlying assumptions in the causal results chain. The "theory of change" approach is better suited to this kind of explanatory work<sup>2</sup>, as it provides a thorough analysis of 'why' programme activities are expected to produce intended results and creates a more in-depth understanding of 'how' change can occur.<sup>3</sup>

## NOTES

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- <sup>1</sup> Gichuki T, Gachathi J, Njiru J. 2017.
- <sup>2</sup> Patel & Wilson 2004.
- <sup>3</sup> ILO 2013.
- <sup>4</sup> Government of Kenya 2015.
- <sup>5</sup> Government of Kenya 2015.
- <sup>6</sup> Government of Kenya 2015.
- <sup>7</sup> Plan of Action 2020.
- <sup>8</sup> Government of Kenya 2015.
- <sup>9</sup> Gichuki T, Gachathi J, Njiru J. 2017.
- <sup>10</sup> World Health Organization 2018.
- <sup>11</sup> Government of Kenya 2017.
- <sup>12</sup> Government of Kenya 2014.
- <sup>13</sup> Kenya National Bureau of Statistics 2019.
- <sup>14</sup> Government of Kenya 2016.
- <sup>15</sup> Kenya National Bureau of Statistics 2019.
- <sup>16</sup> Kenya National Bureau of Statistics 2019.
- <sup>17</sup> Government of Kenya 2013.
- <sup>18</sup> Government of Kenya 2006.
- <sup>19</sup> Kok MC et al. 2015.
- <sup>20</sup> Perry HB, Zulliger R, Rogers MM 2014.
- <sup>21</sup> Kate Gilroy, Tim Williams, et al. 2013.
- <sup>22</sup> Crigler L, Hill K, Furth R, Bjerregaard D. 2011.
- <sup>23</sup> Naimoli JF, Frymus DE, Wuliji T, Franco LM, Newsome MH. 2014.
- <sup>24</sup> USAID, Dalberg Global Development Advisors 2015.
- <sup>1</sup> Veillard J, et al. 2017.
- <sup>2</sup> Root R, van Wyngaard A. 2011.
- <sup>3</sup> Kim, et al. 2012.
- <sup>4</sup> Viswanathan K, Hansen PM, Hafizur Rahman M, Steinhardt L, Edward A, Arwal SH, et al. 2012.
- <sup>5</sup> Hill Z, Manu A, Tawiah-Agyemang C, Gyan T, Turner K, Weobong B, et al. 2008.
- <sup>6</sup> Diakite O, Keita DR. 2009.
- <sup>7</sup> Jenkins 2009.
- <sup>8</sup> Olang'o et al 2010.
- <sup>9</sup> Aseyo, et al. 2018.
- <sup>10</sup> Funnell and Rogers 2011.
- <sup>11</sup> Wholey et al 2010.
- <sup>12</sup> Millar et al 2001.
- <sup>13</sup> Davis et al 2019.
- <sup>14</sup> Scott et al. 2018.
- <sup>15</sup> Schaaf et al. 2018.
- <sup>16</sup> University of North Carolina 2013.
- <sup>17</sup> Mitton and Donaldson 2004.
- <sup>18</sup> Evans DB et al. 2005.
- <sup>19</sup> Herrman et al 2005.
- <sup>20</sup> Colin Mathers and Boerma 2010.
- <sup>21</sup> Mundle et al 2012.
- <sup>22</sup> Cummings 1997.
- <sup>23</sup> Mackinnon and Amott N. 2008.
- <sup>24</sup> James 2011.
- <sup>1</sup> Cummings 1997.
- <sup>2</sup> Mackinnon et al 2006.
- <sup>3</sup> James 2011.

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