Practitioner Expertise to Optimize Community Health Systems

Harnessing Operational Insight

HOPE THROUGH HEALTH

possible+

muso

LAST MILE HEALTH

Partners In Health

LivingGoods

SALL FAMILY FOUNDATION

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Executive Summary

To harness the potential of community health workers (CHWs) to extend health services to poor and marginalized populations and avoid the pitfalls of the post-Alma-Ata period, there is an urgent need to better understand how CHW programs can be optimized. Rigorous evidence that CHW care delivery can improve access to care and reduce mortality continues to accumulate, but the most recent evaluations of national-scale CHW programs remain unfavorable. CHWs can contribute to advancing universal health coverage, but only if they are set up for success via integration into well-designed and adequately funded health systems.

Six organizations – Hope Through Health, Last Mile Health, Living Goods, Muso, Partners In Health, and Possible – have developed high-impact CHW programs with governments and communities across the globe. Understanding that several operational questions are unresolved by current academic evidence, they have come together to identify insights from their implementation experience. The standard operating procedures of each implementing organization were compared and areas of alignment or variation were noted as well as areas where outliers exist. To further explore heterogeneity and outliers, one-on-one interviews were conducted with implementers.

This document was developed under the premise that enabling the development and implementation of high-performing CHW programs requires that design principles and operational guidelines be approached not as a universal "one-size-fits-all" prototype, but as a series of flexible tools. As a result, the document shares not simply how implementers have solved various delivery challenges, but the ways in which their environments have shaped their responses. As the global community strives to achieve the Sustainable Development Goals and universal health coverage, working with CHWs will be critical. We offer these design insights for consideration by the field.

Structure

The following report includes four sections:

1. **The Need for Operational Guidance**

2. **Methods: Harnessing Practitioner Expertise**

3. **Toward CHW Design Principles**

4. **Recommendations and Next Steps**

Key Insights

The comparison of the operational practice of these organizations has revealed several areas of alignment. The six implementing organizations have attempted to summarize these areas in a series of design principles that, in their experience, drive programmatic quality and are debated or not commonly found in programs across the globe. In the experience of the six implementing organizations, effective CHWs are:

1. **Accredited:** The health knowledge and competencies of CHWs are assessed prior to practicing; CHWs must meet a minimum standard before carrying out their work.

2. **Accessible:** To improve accessibility, timeliness, and equity of care, point-of-care user fees should be avoided when possible.

3. **Proactive:** For active disease surveillance, CHWs go door-to-door looking for sick patients and providing training on how to identify danger signs and quickly contact a CHW.

4. **Continuously Trained:** CHWs are trained using modular delivery or other types of in-service learning. Continuing medical education is not only available to but required of CHWs.

5. **Supported by a Dedicated Supervisor:** On a frequent and regular basis, CHWs benefit from a dedicated supervisor who assesses patient experience and provides 1-on-1 coaching.

6. **Paid:** CHWs are compensated financially at a competitive rate relative to the respective market.

7. **Part of a Strong Health System:** CHW deployment is accompanied by investments to increase the capacity, accessibility, and quality of the primary care facilities and providers to which CHWs link, including pharmacy management.

8. **Part of Data Feedback Loops:** CHWs report all data to public-sector monitoring and evaluation systems and data get used by those who collected it to improve programs and CHW performance.

These design elements represent, in the experience of these six organizations, the minimum viable elements needed for CHWs to succeed.

Recommendations and Next Steps

Further articulating and universalizing an operationally specific quality standard demands a broader coalition. The authors commit to build on this initial body of work and propose the following key recommendations:

To implementers at scale, including Ministries of Health and NGO partners:

1. **Join efforts to pool practitioner expertise** to create widely employed design principles and to promote the adoption of these principles in policy and practice.

To the global health community broadly:

2. **Launch an effort to refine and track key performance indicators** that constitute best-practice delivery for community health across contexts.

To funders of community health services:

3. **Employ the forthcoming WHO guidelines**, the design principles presented here, and any future design checklist and key performance indicators as a form of due diligence when investing in CHW-led health delivery.

To researchers:

4. **Refine existing theories of CHW performance** via operational research on key elements of CHW-led health delivery.

The Need for Operational Guidance

Over the past eighteen months, the Millennium Development Goals (MDGs) have expired and the world has entered a new cycle of global targets, the Sustainable Development Goals (SDGs). While significant health progress has been made over the life of the former – including a global reduction in the child mortality rate by nearly 50% since 1990 and the maternal mortality ratio by 45% in the same period – none of the three health – related MDGs were met[1]. This reckoning has happened against the backdrop of a worsening global health workforce shortage and the deadliest Ebola epidemic in history[2, 3].

As the world sets bold new targets focused on championing universal health coverage in the context of these new and ongoing challenges, there is an emerging consensus among global health leaders that adequate preparedness against future epidemics and the ongoing fight against disease will require building stronger health delivery systems, with particular emphasis on community-based primary healthcare[4]. The African Union has endorsed a community health worker (CHW) initiative to recruit, train, and deploy 2 million CHWs across Africa by 2020, twenty-three countries have adopted principles for institutionalizing community health, and CHWs are highlighted as a key strategy of the World Health Organization's Global Strategy on Human Resources for Health: Workforce 2030[5-7].

Deploying CHWs who consistently and effectively provide just 30 life-saving health services in the 73 countries with the highest burden of disease would save as many as 6.9 million lives annually, reducing annual child mortality by almost half[8, 9].

Today, more than 45 countries are committed to CHWs as the frontline of their health system[10, 11]. To harness the potential of CHWs to extend health services to poor and marginalized populations and avoid the pitfalls of the post-Alma-Ata period, there is an urgent need to better understand how CHW programs can be optimized[12].

CHWs and Evidence-Based Practice

Enthusiasm for CHWs has come in waves, beginning nearly a century ago and enjoying recurrent periods of popularity with the barefoot doctors in China during the 1950s, in the post-Alma-Ata period during the 1980s and early 1990s, and again in the MDG-era during the 2000s[13]. Each period favored a different model of CHW, from a community organizer to a lay worker to whom simple medical procedures could be "task shifted" from nurses and doctors. Nevertheless, each wave of enthusiasm has been tempered with sobering realities; a series of reviews in the late 1980s and early 1990s found that large-scale CHW programs often failed to replicate the success of smaller community-based programs[14-19]. Although rigorous evidence is accumulating on the efficacy of CHWs to deliver assorted health interventions[20-23], the most recent evaluations of national-scale CHW programs remain unfavorable[24-27].

The WHO is responding to this situation with the development of new guidelines on health policy and system support to optimize CHW programs[28]. These recommendations will be developed in line with evidence-based practice, using the findings from a series of systematic reviews and the input of health workforce experts, health system planners, and CHW managers[29].

Understanding that several operational questions are unresolved by the academic literature, this document aims to contribute to the harnessing of insights derived from practitioner expertise.

The target audience for this document includes policy-makers, as well as planners and managers responsible for health workforce policy, planning, and implementation at national and local levels. Secondary target audiences include development partners, funding agencies, global health initiatives, donor contractors, NGOs, CBOs, and activists who fund, support, implement, and/ or advocate for the greater and more efficient integration of CHWs into the delivery of health services.

The six organizations that have come together to create this document – Hope Through Health, Last Mile Health, Living Goods, Muso, Partners In

Health, and Possible – have developed high-impact CHW programs with governments and communities across the globe (see table below). Together, these implementers employ CHWs that have provided care to over 1 million patients in more than 15 countries this year. Each organization also works closely or in direct collaboration with their respective Ministries of Health, providing technical support to national CHW efforts that serve more than 22 million people annually. Their work has been highlighted as best practice by the UN, World Bank, USAID, Skoll, and others.

	COUNTRY	FOUNDED	CHWS	KEY COMMUNITY HEALTH SUCCESSES
HOPE THROUGH HEALTH	Togo	2004	43	Improved outcomes across HIV care continuum: increase in HIV exposed infants receiving testing at 2 months, increase in HIV exposed children receiving confirmatory HIV testing at 18 months[30]
LAST MILE HEALTH	Liberia	2007	435	Improved healthcare utilization during and helped contain Ebola outbreak[31]
LivingGoods	Kenya, Uganda	2007	7 500	Reduced under-5 mortality by 27%, relative to control sites[32]
muso	Mali	2005	381	10x reduction in child mortality over 3 years[33]
Partners In Health	10 countries	1987	>13 000	**Haiti:** 100% TB cure rates compared to control sites[34] **Peru:** 60% XDR-TB cure rates[35] **Rwanda:** 92% retention in HIV care and 97.5% viral suppression[36] **Mexico:** highest levels of clinical control for diabetes and hypertension compared to state and national averages[37]
possible	Nepal	2007	60	Improved institutional delivery rate, attendance to antenatal visits, and post-partum contraceptive prevalence[38]

Methods: Harnessing Practitioner Expertise

This document was developed under the premise that enabling the development and implementation of high performing CHW programs requires design principles and operational guidelines to be approached not as a universal, "one-size-fits-all" prototype, but as a series of flexible tools. As a result, it shares not simply how implementers have solved various delivery challenges, but the way in which their environments have shaped their responses.

Representatives from six implementing organizations – which have developed high impact CHW-led healthcare systems with their government partners across a variety of contexts – convened for initial discussion and sharing of their operational approaches to the following areas (see Table below):

1. **Recruitment and Accreditation**

2. **Tasks**

3. **Training**

4. **Supervision**

5. **Incentivization**

6. **Integration** (both with community and national health system)

7. **Reporting**

8. **Supply Chain**

Subsequently, over 100 program documents were assembled and reviewed to add more robust and granular detail. The standard operating procedures of each implementer were extracted and compared in a matrix, which was then second-read for accuracy by program managers from each organization. Areas of alignment or variation were noted as well as areas where outliers exist. To further explore heterogeneity and outliers, one-on-one interviews were conducted with implementers.

While the roles and responsibilities of CHWs vary greatly depending on context and location, the six implementing organizations work exclusively with professionalized CHWs who perform promotional, preventive, and curative tasks. As such, any guidance and insight shared in this paper should be read as pertaining to cadres with similar characteristics.

Toward CHW Design Principles

Best Practice Matrix

The standard operating procedures of each of the six implementing organizations for 25 different program design elements related to the categories below were compared (see *online Appendix A* for full matrix). To more clearly highlight trends across organizations, an abbreviated version of the comparison matrix featuring a single column synthesizing the results can be found below.

DESIGN ELEMENTS	ORGANIZATION PRACTICE
RECRUITMENT & ACCREDITATION	
Selection Criteria	**ALIGNMENT:** (1) Resident of community, (2) literate, (3) preference for women, (4) speaks local language.
Selection Process	**ALIGNMENT:** (1) Nomination by community (2) interviews, (3) literacy test, (4) ultimately selected by health program.
Accreditation	**VARIATION:** Living Goods, Last Mile Health, Hope Through Health, and some Partners In Health CHWs must pass written and scenario based skills test; others may in the future.
CHW: Population Ratio	**VARIATION:** 1:3-10 (chronic care), 1:180-1500 (curative primary care).
TASKS	
Tasks	**ALIGNMENT:** All organizations use generalist CHWs who provide (1) active and passive surveillance, (2) triage and referral care with facilities, (3) community-based diagnosis and treatment, (4) follow-up visits, and (5) prevention efforts.
User Fees	**ALIGNMENT:** To improve accessibility, timeliness, and equity of care, point-of-care user fees should be avoided when possible.
TRAINING	
Training Structure	**ALIGNMENT:** Initial pre-service training then ongoing classroom and field based training. Length determined by CHW tasks.
Competencies Acquired	**ALIGNMENT:** Proactive case detection, recognition and referral of patients with danger signs, diagnosis, treatment, follow-up, household level preventative behaviors in relation to priority health conditions, education about social determinants of health, counselling and motivation skills, and integration within the wider system.

DESIGN ELEMENTS	ORGANIZATION PRACTICE
SUPERVISION & ADVANCEMENT	
Type of Supervisor	**ALIGNMENT:** All use dedicated full-time supervisors. Some programs use nurses, while others use former CHWs who have been promoted into supervisory roles.
Supervisor Training	**ALIGNMENT:** Trained in supportive supervision.
Supervisor Tasks	**ALIGNMENT:** 1:1 direct observation, coaching. Last Mile Health, Muso, Partners in Health-Mexico and Liberia & Hope Through Health do a patient audit and Muso, Living Goods & Possible do personalized CHW analytics.
Frequency of Supervision	**ALIGNMENT:** The supervisor to CHW ratio across implementers is such that individual CHW supervision by a dedicated CHW supervisor can take place at least once per month.
Advancement	**OUTLIERS:** Muso, Living Goods and some Partners In Health sites have promotion opportunities (CHW to supervisor) while other organizations support the philosophy and aim to do so in the future.
INCENTIVIZATION	
Incentives	**ALIGNMENT:** Salary circa minimum wage as a starting point, as well as non-monetary incentives.
INTEGRATION	
Integration with the Health System	**ALIGNMENT:** All CHWs are formally recognized by the public health system (e.g., via an MOU between the NGO and the MoH).
Integration with the Community	**ALIGNMENT:** Formal engagement via program launch, CHW selection, patient satisfaction, proactive case detection and health education meetings. Hope Through Health CHWs engage community in tracking outcomes.
REPORTING	
Reporting Practices	**ALIGNMENT:** All CHWs report data to public-sector monitoring and evaluation systems. They benefit from data feedback loops that enable them to use data for performance improvement.
SUPPLY CHAIN	
Supply Chain Management Practices	**OUTLIER:** Hope Through Health provides 1:1 supply chain capacity building at the clinic level. All CHWs are restocked at group meetings except Last Mile Health CHWs who are restocked directly in the field.

The cell colors indicate where the practice of the working group aligns (taupe), is marked by variation (red), or where there is alignment save for an outlier (green).

A detailed consideration of the design decisions made by the implementers will be provided for each of the eight categories in turn. The table below summarizes the eight sections to come:

EXAMPLE		SAMPLE TOOLS
RECRUITMENT & ACCREDITATION		
LivingGoods	Living Goods' three step recruitment process	• Numeracy/Literacy Test • Competency-based Interview Questionnaire • Scenario-based Accreditation Evaluation
TASKS		
LAST MILE HEALTH	Ebola response by Last Mile Health's polyvalent CHWs	
TRAINING		
	Continuous, community based training	• Modular Training Schedule
SUPERVISION & ADVANCEMENT		
muso	Muso's 360 Supervision	• Patient Satisfaction Audit • CHW Shadowing Checklist • Example CHW Dashboard Output
INCENTIVIZATION		
Partners In Health / LivingGoods / possible	Partners In Health's salary, Living Goods' incentives, Possible Performance Evaluation	• Performance Evaluation Tool
INTEGRATION		
HOPE THROUGH HEALTH / possible	Hope Through Health's public system clinic support and community town halls and Possible's public private partnership	• MESH-QI tool
REPORTING		
LAST MILE HEALTH / possible	Possible/Nepal and Last Mile Health/Liberia reporting systems	• Liberia National CHW Home Visit Form Example
SUPPLY CHAIN		
HOPE THROUGH HEALTH	Hope Through Health's pharmacy management support	• Example Pharmacy Management Form

Recruitment and Accreditation

While the importance of appropriate CHW selection is repeatedly cited by narrative reviews as a precursor to success, uncertainty remains about how best to operationalize the process[39-41]. For instance, some reviewers assert that a balance must be struck between community selection and input from the health system[42], while others maintain that solely the community ought to have an input[40, 43].

Living Goods has designed an approach that involves input from the public health system, the community, and the NGO partner.

The process is as follows:

1. Candidate Pool: Clan elders are asked to screen a pool of public health system approved candidates

2. Competency Screening: The candidates undergo a numeracy and literacy test and answer interview questions with Living Goods to assess relevant competencies and qualities (see *online Appendix B* for numeracy literacy test and competency-based interview questionnaire), and

3. Train-Then-Select: Living Goods puts more CHWs through pre-service than are ultimately needed and selects the best performers to continue (accounting for a 10% dropout rate in the first month).

In this process, attitudes, expertise, and availability deemed essential for the job are clearly delineated prior to recruitment and linked to specific interview questions. Like the other five contributing organizations, Living Goods recruits CHWs based on established criteria including availability, literacy/numeracy, embeddedness in the community, and fluency in the local language. For example, because Living Goods CHWs support themselves via the sale of health products (e.g., clean cook stoves), "selling skills" were noted as important and an interview question specifically asks after their sales experience (see interview question #4 in *online Appendix B*). Where possible, specific competencies were demonstrated rather than simply asked after. For example, because Living

Goods CHWs must do simple calculations to sell their products, numeracy is assessed with a scenario-based math test (see section 1 of the test in *online Appendix B*). Living Goods assesses not just candidate attitude and skill, but their availability to do the job – interview question #8 asks specifically about the candidate's current and future availability.

While the precise requirements set out by Living Goods may not be applicable to all programs, important components of the process are generalizable. The combined experience of the implementers featured in this report suggest that implementers ought to reflect on the considerations in the box below.

Accreditation

Prior to being able to practice, all Living Goods, Last Mile Health (Liberia), and Hope Through Health (Togo) CHWs are required to pass a written and scenario-based skills test. In all cases, the written evaluation assesses health knowledge, whereas the scenario-based practicum assesses competencies (e.g., breath counting, app usage) (see *online Appendix C* for an example evaluation). CHWs are required to pass each component with a mark of 75%-85%, depending on the organization. Should the CHW fail, they receive intensive support and the opportunity to retest.

Unique among the programs profiled, Living Goods CHWs undergo an annual case-study based re-accreditation process in which they are retested on health knowledge and competencies. A pass level of 85% is required for recertification. As with the initial certification, CHWs who do not pass are given additional training and support before retesting and the opportunity to retest twice. While these precise tests may not be transportable to other settings (e.g., CHWs with low literacy levels might demonstrate competencies rather than complete written tests), all implementers believe it is important to have CHWs meet a clearly articulated proficiency standard before beginning to work.

CHW Distribution

While there is a large variation in the CHW:population ratio of the organizations profiled (1:10-

1500), the implementers have a similar approach to arriving at said ratios. All organizations distribute their CHWs based on

1. The size and the density of the population in each catchment area (i.e., ratios will be higher in peri-urban areas than rural areas),

2. The difficulty of the terrain/availability of transportation (i.e., ratios will be lower in areas where environmental factors slow CHW travel), and

3. The package of care provided, including the number of care services provided, the amount of time that each takes, and to whom the services are being delivered (i.e., ratios will be lower for CHWs undertaking more time-intensive tasks like TB DOTs and might be higher for CHWs only delivering care to newborns).

These variables align with considerations highlighted in a narrative review of CHW workload[44].

Notably, there is good evidence for mortality benefit of CHW programs at lower ratios and higher ratios[22, 45], and thus implementers and policy makers will need to consider the three design factors listed above, along with available resources. The implementing organizations profiled here all work closely with local stakeholders as well as government partners to determine an appropriate ratio for their context.

Recruitment Process Design Considerations

☑ *Select CHWs from the communities they serve*

☑ *Include screening by the host community, the formal health system and, if applicable, the NGO partner*

☑ *Delineate attitudes and expertise deemed essential prior to recruitment*

☑ *Allow for identification or, when possible, demonstration of pre-specified attitudes and expertise*

☑ *Certify health knowledge and competencies prior to practicing*

☑ *Train-then-select: recruit more CHWs to pre-service training than are ultimately needed and select the best performers on the accreditation test to continue at the completion of training*

☑ *Distribute CHWs in line with population size & density, availability of transportation, and nature of the care provided*

RATIO OF CHW TO POPULATION					
HOPE THROUGH HEALTH	LAST MILE HEALTH	LivingGoods	muso	Partners In Health	possible
Urban 1:3000 Rural 1:800	Max 1:350 Avg 1:180	1:800	Urban 1:1000 Rural 1:700	Polyvalent 1:165-1500 HIV/TB/NCDs 1:3-10	1:1500

*Partners In Health Operates in 10 countries, ratios vary across sites

Living Goods CHW provides care in the home.

CREDIT: LIVING GOODS

Tasks

The roles and responsibilities of CHWs vary greatly depending on patients' access to facility-based care and the existence of other cadres of health workers[46]. CHW tasks nonetheless tend to fall into four broad categories:

1. Assisting individuals and communities in adopting healthy practices,

2. Conducting outreach to ensure access to care,

3. Providing or supporting primary and chronic care, and

4. Advocating for structural changes related to community health needs[47]. Systematic reviews have concluded that CHWs in resource-poor settings can be effective at delivering health services as diverse as birth control injections[48]; neonatal care[49, 50]; case management of malaria, diarrhea, and acute respiratory infections[23, 48, 51-53]; HIV care management[20, 54], and mental healthcare[55, 56]. The share of tasks in each of the four categories varies across locations, though all six organizations identify tasks in conjunction with Ministry of Health partners in line with national and local healthcare priorities and integrate new tasks on an as-needed basis[43].

As Berman et al.[57] note in their seminal CHW review, "CHW programs represent a mode for the organization of services rather than a type of intervention" (p. 445). Reflecting this understanding, all the organizations profiled here use generalist CHWs who proactively mobilize communities where they operate and offer a mix of promotional, preventive and curative tasks to extend universal health coverage and improve health equity [e.g. 58]. Critically, CHWs from the six implementing organizations do both passive (community members visit CHW when ill) and active (CHW does routine home visits) disease surveillance.

By emphasizing surveillance and conceptualizing CHWs as polyvalent delivery agents rather than components in a vertical disease program, CHWs can help respond to and prevent new disease threats. For example, during the Ebola epidemic in Liberia, Last Mile Health was able to quickly add a new module on the disease to their CHW training program. Consequently, CHWs were rapidly mobilized to screen for Ebola and perform contact tracing. Importantly, despite the substantial declines in healthcare utilization in other regions of the country during the outbreak, areas with Last Mile Health CHWs showed increases in healthcare use[31]. While there were no CHWs in the remote village in Guinea from which the Ebola epidemic originated, active surveillance can help flag and mitigate future epidemics more rapidly[59].

In line with a narrative review on CHW workload, the six organizations profiled agree there is no known ideal or maximum number or mix of CHW tasks[44]. In their experience, however, using modular training (described in the next section) to incrementally increase tasks ensures each new duty is clearly defined and allows for easy identification of and quick adjustment at the point CHWs become overloaded.

Regardless of the task mix, the six implementing organizations agree that implementers should move toward the removal of point-of-care user fees for accessing CHW services and care.
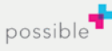
Randomized trials and reviews of empirical evidence demonstrate that charging even very small

CHW TASKS AND TRAINING TIME

	HOPE THROUGH HEALTH	LAST MILE HEALTH	LivingGoods	muso	Partners In Health	possible
Community entry/ activation	X	X	X	X	X	X
Community mapping	X	X		X	X	X
Household registration	X	X	X	X	Malawi, Rwanda, Liberia, Lesotho, Perú	X
Health education on positive health behaviors	X	X	X	X	X	X
Proactive case detection	X	X		X	X	X
Patient referral	X	X	X	X	X	X
Proactive case retention: follow-up home visits for sick and recovering patients	X	X		X	X	X
Contraceptive counseling and administration or referral	X	X	X	X	Mexico, Malawi, Rwanda, Lesotho, Haiti	X
Pregnancy risk screening and antenatal care follow-up	X	X	X	X	Mexico, Malawi, Rwanda, Lesotho, Perú	X
Maternal and newborn risk screening and postnatal care follow-up	X	X		X	Mexico, Malawi, Rwanda, Lesotho	X
Identification and management of under-two children for measles & ear infections						X
Integrated management of childhood illness (diarrhea, malaria, pneumonia, malnutrition)	X	X	X	X	Rwanda, Lesotho, Haiti	X
Vaccine tracking	X	X			Haiti, Malawi, Lesotho	

CHW TASKS AND TRAINING TIME						
	HOPE THROUGH HEALTH	LAST MILE HEALTH	LivingGoods	muso	Partners In Health	possible
Diagnosis and treatment of malaria, all ages		x		x	Rwanda	
Community based distribution of deworming tablets, and WASH products		x	x	x	Haiti, Rwanda	
Screening and treatment adherence support for HIV/AIDS and TB	x	x			x	
Screening and treatment adherence for leprosy, buruli ulcer, and/or lymphatic filariasis		x			Liberia	
Screening and treatment adherence for mental health					Mexico, Haiti, Perú, Liberia	x
NCD follow-up visits, including blood pressure screening and management					Navajo, Mexico	x
Basic first aid		x			Navajo	
Reporting of data for all services provided	x	x	x	x	x	x
Pre service training (days)	18	10	22	36	10 - 50	10
In-service training (days/year)	20	30	12	5-6	12-24	20-30

user fees generates little revenue, but dramatically reduces access to important services and health products for the poor[60-63]. The implementing organizations have witnessed similar outcomes in their own work, documenting the way such fees decrease utilization of health services and result in incomplete or inadequate care, food insecurity, and reduced agency for women in healthcare decision making[64]. Simulation models suggest that eliminating user fees could have an immediate and substantial impact on child mortality[65]. It has been suggested that user fees could help avoid inappropriate use or resale of essential medicines or finance incentives for maintaining local stocks of essential medicines; however, these influences have not been rigorously tested[60].

The WHO has previously noted that user fees may hinder coverage, utilization, and impact. As such, they represent a barrier toward attaining universal health coverage[66, 67]. The implementing organizations echo this conclusion and agree that point-of-care user fees should be avoided when possible.

Training

Unlike other cadres of health workers (e.g., doctors), CHW training is not always nationally defined or consistently enforced. It is therefore important to provide adequate detail regarding how CHWs are prepared for their roles.

Tasks Design Considerations

☑ *Integrate vertical disease areas if possible*

☑ *Employ both active and passive surveillance*

☑ *Avoid point-of-care user fees when possible*

☑ *Identify tasks relative to national and local healthcare priorities and integrate new tasks on an as-needed basis.*

Some CHWs have only a few days of pre-service training, while others have six months or more[9]. This variation is reflected by the organizations contributing to this paper: pre-service training ranges from 8 to 45 days. The driving factor behind the duration was the number of competencies imparted pre-service, rather than in-service (e.g., some organizations have CHWs begin by conducting a health survey, others impart curative or preventative skills immediately). Competencies included biological/medical knowledge, curative and preventative skills, education about social determinants of health, counseling and motivation skills, and information about how to integrate with the wider healthcare system. Similar to choices made regarding the ratio of CHW providers to patients, choices of pre-service and in-service training are made on several key context-specific factors, including:

1. Priorities of the national healthcare systems (including Ministry of Health mandates),

2. Priorities of local stakeholders (including regional health programming needs and coordination with local healthcare facilities),

3. Local and national epidemiology (including communicable and non-communicable diseases as well as context-specific issues impacting health), and

4. Balancing of responsibilities by CHWs that are not being carried out by other healthcare providers in the region (i.e., avoidance of redundancy and optimization of task-shifting).

All organizations used both theoretical and practical modalities, including both face-to-face participatory learning methods and electronic learning techniques. While each organization staged an initial training away from community (e.g., in a health facility), each also stresses continuous training within the community, or at least training interspersed with periods of practice in the community (see *online Appendix D* for an example schedule). All organizations profiled employ some form of continuous training, ranging from fortnightly to annually. This emphasis on modular and/or continuous training (including multiple refresher and advancement sessions) as an enabling factor for CHW motivation and program success is consistent with the findings of several reviews[43, 68].

Training Design Considerations

☑ *Emphasize frequent and ongoing in-service training, including modular delivery, in addition to pre-service training*

☑ *Deploy predominantly practice-based learning techniques*

Community Health Workers visit a mother and her newborn baby to provide post-natal counseling and care-planning, in the Achham district of Nepal.

PHOTO CREDIT: POSSIBLE.

Supervision & Advancement

Several narrative and systematic reviews have identified supervision as critical to maintain program quality and CHW motivation[39, 68-71], yet what quality supervision entails and how it ought to be operationalized remain unclear.

Supervision Visits

Supervision is not a monolithic concept, but an umbrella term for a series of tasks. For the six organizations profiled here, supervision involves: (a) data quality checks, (b) direct observation of CHW health knowledge and clinical skills, and (c) one-to-one coaching on strengths and weaknesses. Five organizations (Hope Through Health, Last Mile Health, Muso, Living Goods, and Possible) also perform patient audits to ensure services were carried out as reported and to solicit feedback on service improvement. The supervisor-to-CHW ratio across implementers is such that individual CHW supervision by a dedicated CHW supervisor can take place at least once per month.

Muso, Possible, and Living Goods use technology that enables supervisors – or in the case of Living Goods, supervisors and CHWs – to see real-time performance data. Muso is currently trialing the use of a CHW performance dashboard as part of a dedicated supervision strategy called 360 Supervision: (1) The visit begins with an assessment of the CHW care over the past month via a CHW dashboard. The dashboard, designed and built in partnership with nonprofit technology company Medic Mobile, graphically displays a CHW's performance for three indicators:

1. **"quantity" of care** (number of homes visited during the month),

2. **"timeliness" of care** (percentage of sick children under five treated within 24 hours of symptom onset),

3. **"quality" of care** (e.g. the percentage of sick children under five treated without a protocol) (see sample dashboard in *online Appendix E*).

(2) The supervisor then proceeds to the community, visiting a random selection of the CHW's patients, to evaluate patient satisfaction and check the accuracy of CHW-reported data (see tools in *online Appendix E*). (3) The supervisor shadows and directly observes the CHW as she provides outreach and care, to identify strengths and challenges that can best be captured through direct observation, such as correct respiratory rate count and hand-washing prior to patient care (see supervisor form in *online Appendix E*). (4) The supervisor then sits down with the CHW to provide one-on-one coaching that consolidates feedback on strengths and areas for improvement from parts 1-3.

Supervisors

While supervisors serve as an essential conduit for coaching, verifying data, assessing patient experience, and broader performance management, it is worth considering what other tasks they might perform considering program or regional context. Given the remoteness of the communities served by Last Mile Health CHWs, for example, its supervisors also restock CHWs during visits and, once a month, perform vaccinations. This minimizes transportation cost and time away from the com-

munity for the CHW and increases the accessibility of even more services.

While all programs use dedicated supervisors, Muso, Living Goods, and some Partners In Health programs do not exclusively employ nurse supervisors. They argue that management, supervision, and motivation of CHWs is a separate and equally valuable role that requires a different set of skills and training. Moreover, this allows for the best performing CHWs to be promoted into supervisory roles – the type of advancement opportunity that, if stressed during recruitment, has been found to improve CHW performance[72]. On the other hand, organizations that employ nurse supervisors see opportunities for supervisors to provide both clinical mentorship as well as to perform additional clinical tasks such as continuous on-the-job training to CHWs, broader community education sessions, and patient referral support.

Supervision Design Considerations

☑ *Use a dedicated supervisor*

☑ *Have supervisor*

- *provide frequent (at least monthly) individual supervision visits for each CHW in the field.*
- *directly observe CHW practice with patients*
- *provide targeted feedback after patient encounter on areas for continued improvement*
- *verify CHW data*
- *provide summary statistics of CHW performance to CHW to identify areas for improved service delivery*
- *assesses patient experience*

☑ *Consider how else supervisors can serve CHWs and the community (e.g., restocking, community education sessions/ trainings, referral support, higher level care, etc.)*

Incentivization

Insufficient incentivization is frequently cited in primary studies as a barrier to sustainability and scale-up of CHW programs[40, 68]. While there is disagreement in the literature about the ideal form of compensation (i.e., monetary vs. non-monetary), that CHW motivation must be addressed is not in dispute[73-75].

The six implementing organizations recognize that non-financial incentives have been demonstrated to be powerful motivators and all provide them. Common incentives range from public recognition in the community to provision of material goods such as clothing and technology to the availability of training and advancement opportunities.

The six implementing organizations are, however, unanimous that non-monetary incentivization isn't sufficient. Five of the six programs profiled here have chosen to pay their CHWs roughly minimum wage, whereas Living Goods uses performance-based monetary incentives. This aligns with systematic review evidence that indicates that CHWs prefer and perform better when compensated with financial, rather than only non-financial, incentives[74]. Partners In Health (10 countries) and Living Goods illustrate two different approaches to monetary compensation.

While Partners In Health recognizes the efficiencies that flow from paying CHWs – increased retention, lower capital costs – their motivation is not primarily programmatic[34]. Partners In Health pays CHWs because, "above all else, [they] believe it morally and ethically wrong to ask the poor to volunteer" their time and labor to secure their own basic right to health. Insofar as Partners In Health offers instrumental justifications, they are related to a "virtuous social cycle": preferentially employing the poor and the marginalized (e.g., HIV+) leaves them more financially secure, with better access to care themselves, and less precariously isolated in the face of stigma[76].

Maribel Perez, an acompañante with Compañeros En Salud, visits Petrona Lopez at her home in Plan de la Libertad, Chiapas, Mexico

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That said, Partners In Health works with governments in ten different countries. While the values outlined above guide their advocacy, how CHWs are ultimately compensated is a decision taken jointly with many stakeholders. Thus, payment takes multiple forms – for example, as a monthly sum (Haiti), as food packages commensurate to a salary (Mexico), as a series of payments tied to completing key elements of a workflow (Lesotho), etc.. Because the idea is for the salary to be emancipatory, minimum wage is understood as a good starting point for full-time jobs, but compensation should go higher if possible.

Like Partners In Health and the other four organizations profiled here, Living Goods believes strongly in the necessity of monetary compensation. Living Goods, however, adheres to the principle that a meaningful portion of compensation should be variable. Financial incentives for attendance have been demonstrated to reduce high rates of absenteeism compared to fixed salaries[77,] and compensating CHWs for transport costs may play a role in the maintenance of adequate stocks of essential medicines[78]. Currently Living Goods CHWs encourages a variety of behaviors using both financial (revenue from sales, small bonuses paid for meeting health targets) and non-financial (public recognition for high performers) incentives.

While performance incentives have been shown to improve health worker motivation, patient satisfaction, and health outcomes – particularly for simple tasks – where health workers have more complex objectives that require multiple behaviors, incentives must be carefully managed to avoid distorting behavior in unintended and undesirable ways[27, 79-81]. Given this, Living Goods employs quality systems that monitor an array of health worker behaviors, allowing for quick adjustments to training, supervision, and incentive structures as needed.

Possible's provision of annual performance-based raises, like those received by other full-time employees, is another way of holistically assessing and rewarding CHWs who faithfully execute their responsibilities (see annual performance evaluation in *online Appendix F*).

Incentive Design Considerations

- ☑ *Compensate financially at a competitive rate relative to the respective market (at least minimum wage, if not more competitive)*

- ☑ *Link to performance if potential for distortion is low*

- ☑ *Incorporate non-monetary incentives in addition to financial incentives*

Integration

How might CHWs be integrated with both the community and the public health system? While alignment with the public system is not without risks (political upheaval and de-prioritization by the ministry of health can be a barrier to CHW programs[68]), narrative and systematic reviews[44, 68, 74, 75, 82] have cited integration with the existing health system and healthcare providers as an enabling factor for community health programs. Similarly, such reviews [39, 74] have found that community embeddedness (i.e., when community members have significant control over the selection, monitoring, tasks, and priority-setting of CHWs) can improve CHW motivation and performance, and that a lack of community support can increase attrition.

How can such integration be fostered? While the six organizations profiled here typically initiate various community engagement strategies and participate in technical working groups with the Ministry of Health (both for the sake of alignment and so that local implementation experience can help inform national strategy formulation), Hope Through Health and Possible have additional structures worth highlighting.

Integration with the Health System

Memorandum of Understanding

Hope Through Health has signed a memorandum of understanding (MoU) with the district Health Directorate of the Kozah District. Like the MoUs signed by other organizations (Last Mile Health, Partners In Health, Living Goods, Muso), the memorandum specified how the work of CHWs would be linked to health facilities – in this case, the linking mechanism was supervision meetings at a clinic each week. This regular, frequent contact has allowed the clinic staff to organically integrate facility and community workflows. For instance, health workers at the clinic provide CHWs with a list of patients who haven't completed their vaccinations; CHWs can then identify patients, conduct home-based follow up, and help get patients to the clinic. Similarly, CHWs notify the health facility of home births, and refer those women to the clinics for postnatal care.

The most critical aspect of the agreement, however, is that Hope Through Health provides clinical men-

torship to the local facilities via a Clinical Mentor, a nurse trained in supportive supervision. Inspired by Partners In Health's Mentorship and Enhanced Supervision for Health Care and Quality Improvement (MESH-QI) program, the Clinical Mentor is responsible for working with the staff at each facility to improve the quality of care[83]. The Clinical Mentor works about 4 days a month in each facility to sharpen clinical skills, streamline health center administration, and improve pharmacy management. In addition to provision of a Clinical Mentor, Hope Through Health takes multiple steps to reinforce primary care capacity at the clinical level, including infrastructure improvements and support to remove user fees to the local facilities. While this would at first seem to have little to do with the provision of community health, this design choice stemmed from the acknowledgement (borne out by systematic review findings that CHW performance requires well-functioning health services[82]) that CHWs cannot be deployed independent of a functional primary healthcare system.

Contract

Establishing clear roles and responsibilities for CHWs and NGO partners within the context of the health system is critical and can be greatly facilitated by an MoU. This clarity can also be achieved via a public private partnership (PPP) – as exemplified by Possible and the Ministry of Health (MoH) in Nepal. The PPP model has been used extensively across sectors to leverage private-sector capacity to meet public-sector needs. In such PPPs, healthcare infrastructure management, and community-based and hospital-based healthcare services are contracted to a private-sector partner (which can be non-profit, as in Possible's case, or for-profit as in other cases)[84]. PPPs are helpful from a CHW integration standpoint because the MoH, as payer, has a clear incentive to closely integrate community programming into pre-existing healthcare systems. More broadly, advantages of PPP include improved healthcare quality and efficiency and the option to tie public-sector financing mechanisms to quality metrics[84]. Conversely, there remains concern such partnerships have limited accountability, and recent efforts have focused on addressing these challenges[85].

Possible's PPP with the MoH includes the management of healthcare infrastructure, hospital-based

The Electronic Health Record (EHR) system incorporates five components: (1) Simprints for identification of all patients, (2) CommCare, an android-based platform for CHWs, (3) Bahmni, an OpenMRS facility-based electronic health record for doctors and mid-level providers at hospitals, (4) MOTECH, which syncs between the community-based and facility-based systems, and (5) dhis2, the government's Digital Health Information Systems 2 platform for public-sector health data reporting.
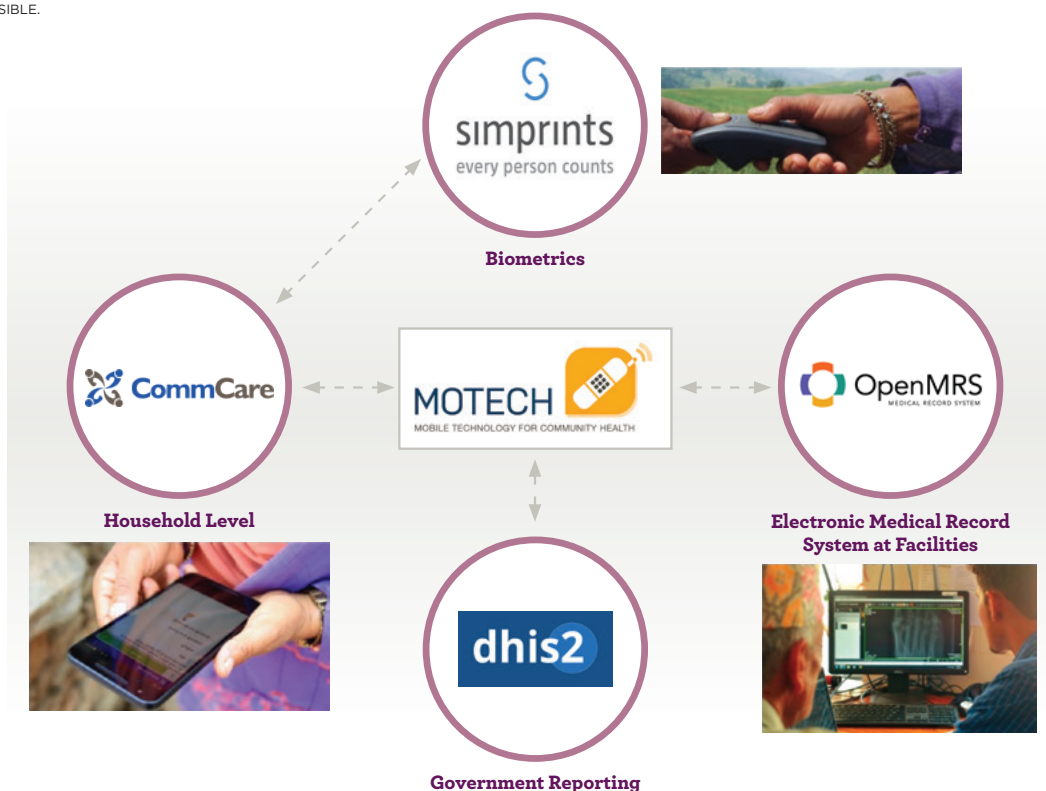
services, and community-based services via CHWs across two districts. The PPP was developed with the MoH with attention to accountability and includes regular reporting of key performance indicators by Possible to local and central government bodies. CHWs are incorporated into the PPP to complement hospital-based services and offer the MoH an opportunity to more deeply integrate healthcare programming at district-level hospitals with services provided by CHWs. CHW services were collaboratively determined as a part of the PPP, with target diseases prioritized by the MoH. Similar models are being explored in multiple countries and offer an important opportunity to consider in the design of CHW programs[86, 87].

Community Integration
Hope Through Health's Clinical Mentor also plays a critical role as an "honest broker" between the facility and the community. While the six organizations profiled here typically consult the community prior to program launch, throughout CHW selection, during patient satisfaction audits, and at health education meetings, Hope Through Health takes an additional step of holding bi-annual community town hall meetings (or feedback forums). In these meetings, the Clinical Mentor, along with a representative from the Ministry of Health presents health data on utilization, CHW visits, and family planning uptake (among other variables) back to the community. Typically, the Clinical Mentor and CHW supervisors will first ask the community their impression of an outcome (e.g., Has it improved? Regressed?) and will then draw run charts on flip chart paper to indicate what the data they have collected indicate (see image above). The community discusses the data, asks questions, and makes plans based on

areas that need improvement. There is also an opportunity for community members to ask any other questions they might have or air grievances. In line with systematic review findings[75,] Hope Through Health has found that this participatory practice helps the community have a clear understanding of and expectation for the services being provided by the CHWs and that the dynamic interaction around the program's outcomes has increased self-professed ownership of the CHW program by the community and engagement from ministry representatives.

Integration Design Considerations

☑ *Explicitly define relationship between NGO partners and the MoH (e.g., in MOU, PPP)*

☑ *Ensure NGO partners collaborate under the leadership of the MoH to support the national CHW strategy*

☑ *Accompany CHW deployment with investments to increase the capacity, accessibility, and quality of the primary care facilities and providers to which CHWs link*

☑ *Involve community and policymakers via outcome sharing, goal development, and accountability*

☑ *Have CHWs facilitate health center referrals and provide community-based follow-up*

Reporting

As noted above, disease surveillance is a central component of public health systems. Resource-limited countries, however, typically derive data from two suboptimal sources: (1) demographic health surveys conducted on an intermittent basis; and (2) facilities data on the volume of cases treated. Surveys fail to capture data sufficiently quickly to respond to emerging disease threats. Facility-based data fails to capture diseases that never reach clinics. Neither captures detailed information about implementation and the performance of health workers. Given this context, the six implementing organizations agree that robust data monitoring and reporting is an integral component to CHW programs. Across implementing organizations multiple systems have been employed to address this challenge, each tailored to the local context. We here highlight two of them here – one digital (Possible) and one paper-based (Last Mile Health).

Possible, in partnership with the Ministry of Health of Nepal, has created an integrated Electronic Health Record (EHR) system that links care at the community level via CHWs, to care provided at local hospitals, enabling coordination and population-level monitoring[88]. The system has four core technical functions: (1) Biometric Identification: Because Nepal lacked a robust national identity system, tracking patients accurately and efficiently was not possible. To compensate for this, Possible chose to register patients using Simprints' robust fingerprinting device (owing to its low cost, ease of use, and acceptability to users). (2) Platform for community care: Possible prioritized finding a modular, affordable, easy to use, plat-

form for CHWs that could integrate with the hospital-based EHR; they selected Dimagi's Commcare. (3) Integration with hospital-based HER: Possible uses Bahmni, developed by Thoughtworks. A primary consideration in rural Nepal, where most providers have had limited prior exposure to computers, was having a well-tuned user experience without non-essential features. Both Commcare and Bahmni communicate via the cloud platform with MOTECH (Mobile Technology for Community Health) and the existing government reporting system via DHIS2 (see diagram below). This is an important component of integration as it allows for accountability and fosters further integration into and ownership of programs by the public system. (4) CHW Management System: By utilizing embedded functions in Commcare that geotag all data inputted and audio-record random patient encounters, nurse supervisors can leverage the reporting system for performance management and quality improvement purposes in addition to disease surveillance.

Last Mile Health and the Liberian Ministry of Health's Community Based Information System (CBIS) demonstrates that such integration can also be achieved without the use of online data collection tools (much of Liberia does not have cell service and EHR exists in only two health facilities). In this system, CHWs use paper, user-centric forms based on a national indicator framework (see example in _online Appendix G_). The data from these forms are checked by their supervisors, and then aggregated at the supervisor, county, and country level.

Data are used from the community level (where supervisors use monthly summaries to ensure CHWs are on target) to the national level (where the national community health program team use data presented in quarterly review meetings to tweak the national program).

In both Nepal and Liberia, all data are reported to public-sector monitoring and evaluation systems and the reporting structure includes multiple data feedback loops. Rather than data flowing unidirectionally and reaching the capital only intermittently, such practices enable data to be used for disease surveillance and performance management at local, district, regional, and national levels.

Supply Chain

Systematic and narrative reviews have found that CHWs not having their supplies regularly restocked is a major hindrance to productivity and motivation[44, 75, 89]. While most organizations profiled here use a parallel procurement system, Hope Through Health aims to strengthen and capacitate the public system to provide a consistent and reliable supply chain to CHWs.

Hope Through Health works to strengthen the capacity of public clinics to more effectively manage supply chain by addressing three domains: human resources, data management systems, and oversight. First, Hope Through Health ensures that each clinic is staffed with at least one full-time pharmacy manager whose sole responsibility is stock management. Second, the Clinical Mentor described earlier (section iii. integration) works with the pharmacy managers at each public health center (typically a community volunteer who has received no pharmacy training) to improve the way they store, track, project, and order stock. The Clinical Mentor trains the pharmacy manager on basic pharmacy management principles (e.g., first in/first out, how to set up a stock management system, how to calculate average monthly consumption order based on this, etc.). The principles are applied to the management of the clinic stock as well as the stock provided by the clinic to CHWs. Third, the Clinical Mentor conducts ongoing oversight using a pharmacy supervision form (see form in *online Appendix H*), inspired by materials from VillageReach in Malawi, to observe the pharmacist in action and give feedback in real time.

Acknowledging that the public supply chain is not always sufficient, Hope Through Health directly equips clinics with sufficient medication stocks for both clinic and CHW needs. At present, Hope Through Health procures from the national pharmacy at the central level to equip clinics directly. Via the steps outlined above, Hope Through Health aims to improve the supply chain capacity at the district and regional level to fully integrate into the national procurement system in the future.

In the current system, CHWs keep track of their own stock and submit a monthly stock report and resupply request to the pharmacy manager at the public health center; they are restocked at the health center. At Last Mile Health, where CHWs tend to be located further from the clinic, supervisors restock CHWs in the field during supervision visits.

Supply Chain Design Considerations

☑ *Support facility-based pharmacies to assess and mentor deficiencies using pharmacy management principles*

☑ *Have CHW Supervisor monitor CHW inventory whether through in-person or digital communications*

☑ *CHWs should have clarity around standard operating procedures for regular inventory monitoring and re-supply*

Last Mile Health CHW James George performs a follow-up visit for a young patient with malaria and pneumonia in Rivercess County, Liberia.

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Key Insights

The comparison of the operational practice of these organizations has revealed several areas of alignment. While any synopsis of operational detail will necessarily be incomplete, the six implementing organizations have attempted to summarize the exercise above in a series of design principles that, in their experience, drive programmatic quality and are debated or not commonly found in programs across the globe. In the experience of the six implementing organizations, effective CHWs are:

1. **ACCREDITED:** The health knowledge and competencies of CHWs are assessed prior to practicing; CHWs must meet a minimum standard before carrying out their work.

2. **ACCESSIBLE:** To improve accessibility, timeliness, and equity of care, point-of-care user fees should be avoided when possible.

3. **PROACTIVE:** For active disease surveillance, CHWs go door-to-door looking for sick patients and providing training on how to identify danger signs and quickly contact a CHW.

4. **CONTINUOUSLY TRAINED:** CHWs are trained using modular delivery or other types of in-service learning. Continuing medical education is not only available to but required of CHWs.

5. **SUPPORTED BY A DEDICATED SUPERVISOR:** On a frequent and regular basis, CHWs benefit from a dedicated supervisor who assesses patient experience and provides 1-on-1 coaching.

6. **PAID:** CHWs are compensated financially at a competitive rate relative to the respective market.

7. **PART OF A STRONG HEALTH SYSTEM:** CHW deployment is accompanied by investments to increase the capacity, accessibility, and quality of the primary care facilities and providers to which CHWs link, including pharmacy management.

8. **PART OF DATA FEEDBACK LOOPS:** CHWs report all data to public-sector monitoring and evaluation systems and data get used by those who collected it to improve programs and CHW performance.

These design elements represent, in the experience of these six organizations, the minimum viable elements needed for CHWs to succeed.

Recommendations and Next Steps

As the world sets bold new targets focused on championing universal health coverage, there is an emerging consensus among global health leaders that adequate preparedness against future epidemics and the on-going fight against disease will require building stronger health delivery systems, with particular emphasis on community-based primary healthcare.

Understanding that numerous operational questions related to community health are unresolved by the literature, six implementing organizations came together to identify insights from their implementation experience. While the six implementing organizations have been aware of each other's work for close to a decade, each arrived at new design insights during the process of comparing standard operating procedures in a structured way.

Practitioner expertise is, by definition, not conclusive. It nonetheless remains an essential component of evidence-based practice and a key element in moving toward guidance that is operationally specific enough to be meaningful for those designing, managing, and financing CHW programs.

Further articulating and universalizing an operationally specific quality standard demands a broader coalition. The authors commit to build on this initial body of work and propose the following key recommendations:

To implementers at scale, including Ministries of Health and NGO partners:

1. *Join efforts to pool practitioner expertise to create widely employed design principles and to promote the adoption of these principles in policy and practice.*

The implementing organizations behind this paper have modeled how collaboration is a catalyst for operational insight and subsequent quality implementation. While the authors were tempted to produce a design checklist, we recognize that the quality, utility, and uptake of such a tool hinges on the breadth of the movement that creates it. Recognizing that several salient operational questions are unresolved by the literature, we call on implementers at scale to join in creating operational guidance that incorporates, builds on, and gives visibility to this and other existing collections of practitioner insights (e.g., USAID AIM, Joint Commitment to Harmonize Partner Action). Such guidance would take the form of a design checklist, a list of recommended performance metrics, and supporting materials for policy makers and implementers (see Appendix I for a mock-up).

To the global health community broadly:

2. *Launch an effort to refine and track key performance indicators that constitute best practice delivery for community health across contexts.*

To avoid the pitfalls of the post-Alma-Ata era and repair the present-day disconnect between strong evidence of CHW efficacy and the repeated failure of large scale-community health programs, community health delivery must become data driven and comparable. Deficiencies in design and implementation must be identified more quickly and corrected based on the integration of the best research evidence with practitioner expertise.

The launch of an effort that builds on existing evidence, experience, and theories of CHW performance[90, 91] to validate quality process indicators and establish a regular data collection mechanisms against those indicators (e.g., similar to the Primary Health Care Performance Initiative) is necessary for such an effort. Ideally, such work would be based within an existing regional institution or network such as the forthcoming WHO CHW Hub and would also enable the provision of "on call" experts to facilitate peer-to-peer learning and provide in-country support in navigating trade-offs associated with implementing the WHO guidelines and accompanying operational guidance. We as a group of implementers are ready to engage in this work in the context of such a coalition and call upon funders to support this undertaking.

To funders of community health services:

3. *Employ the forthcoming WHO guidelines, the design principles presented here, and any future design checklist and key performance indicators as a form of due diligence when investing in CHW-led health delivery.*

Not all community health programs are set up for success. Large financers of global health – including development banks, multilaterals, and foundations – can support the creation of and subsequently leverage the design checklist to push forward an agenda of high-performance CHW care delivery. Such groups should assess the design of planned programs and implementation of existing programs against the forthcoming design checklist and performance indicators prior to investing.

To researchers:

4. *Refine existing theories of CHW performance via operational research on key elements of CHW-led health delivery.*

For health tasks where CHW care has demonstrated impact, the focus of new research ought to shift to the delivery design elements: assessing the impact of staffing, workflow, and performance management design on health outcomes. While there is currently insufficient evidence to assess which changes to CHW program features are most effective in improving performance, component selection experiments could help illuminate these pathways and better enable policymakers to navigate tradeoffs in CHW program design.

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Appendices

Information on how to cite the report and Appendices A-H are [available online](.).

APPENDIX A: *Comparison Matrix*

APPENDIX B: *Living Goods Numeracy-Literacy Test and Interview Questionnaire*

APPENDIX C: *Living Goods Accreditation Sample*

APPENDIX D: *Muso Modular Training Schedule*

APPENDIX E: *Muso Supervision Tools*

APPENDIX F: *Possible Annual Performance Evaluation*

APPENDIX G: *Liberia CHW Form Example*

APPENDIX H: *Hope Through Health Pharmacy Management Form*

APPENDIX I: *Example Checklist and Key Performance Indicators*

Topics in recruitment and accreditation are used here as mock-up example. The motivation behind the checklist questions is to test assumptions and guide policymakers to relevant considerations when writing national community health scale-up plans. The key performance indicators could provide an idea of program health. The toolkit would link policymakers to example materials that indicate how other programs have operationalized a feature (e.g., accreditation) in other contexts.

DESIGN CHECKLIST QUESTIONS	KEY PERFORMANCE INDICATORS	TOOLKIT
☑ What attitudes and expertise are essential for these CHWs? List them:	☑ % of CHWs accredited	• Numeracy/Literacy Test
☑ Look at the list. Via what tool will each be assessed/demonstrated in the recruitment process?	☑ Selectivity: # of trainees recruited to pre-service training/# of CHWs ultimately selected	• Competency-based Interview Questionnaire
☑ How are candidates screened by the host community? The formal health system? (If applicable), the NGO partner?		• Scenario-based Accreditation Evaluation
☑ How will health knowledge and competencies be tested prior to practicing? What is the minimum standard? How many times will CHWs be able to re-test? What will happen if they do not meet the standard?		
☑ How many trainees will need to be recruited to allow for a train-then-select strategy? How will these numbers be reached?		

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