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## RESEARCH AND EVALUATION REPORT

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# Improving CHW Program Functionality, Performance, and Engagement: *Operations Research Results from Zambia*

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June 2012

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This research report was prepared by University Research Co., LLC (URC) and Initiatives Inc. for review by the United States Agency for International Development (USAID). It was authored by Lauren Crigler and Rebecca Furth of Initiatives Inc. The community health worker program improvement study in Zambia was funded by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and carried out under the USAID Health Care Improvement Project, which is made possible by the generous support of the American people through USAID.



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# Improving CHW Program Functionality, Performance, and Engagement: Operations Research Results from Zambia

JUNE 2012

Rebecca Furth, PhD, Senior Technical Advisor, Initiatives Inc.

Lauren Crigler, BA, Senior Advisor for Workforce Development, Initiatives Inc.

**DISCLAIMER**

The views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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For more information on HCI's work, please visit [www.hciproject.org](http://www.hciproject.org) or write [hci-info@urc-chs.com](mailto:hci-info@urc-chs.com).

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## Abbreviations

AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal care
ART	Antiretroviral therapy
BP	Blood pressure
BL	Baseline
CATF	Community AIDS Task Force
CBO	Community-based organization
CHW	Community health worker
CHW AIM	Community Health Worker Assessment and Improvement Matrix
CI	Confidence interval
DATF	District AIDS Task Force
DHMT	District Health Management Team
EL	Endline
FBO	Faith-based organization
HBC	Home-based care
HCC	Health center committee
HCI	USAID Health Care Improvement Project
HIV	Human immunodeficiency virus
HR	Human resources
IRB	Institutional Review Board
MCH	Maternal and child health
MDG	Millennium Development Goal
MOH	Ministry of Health
MT	Mid-term
NGO	Non-governmental organization
NHC	Neighborhood health committee
OVC	Orphans and vulnerable children
PATF	Provincial AIDS Task Force
PC	Pearson correlation
PEPFAR	U.S. President’s Emergency Plan for AIDS Relief
PNC	Postnatal care
QA	Quality assurance
URC	University Research Co., LLC
USAID	United States Agency for International Development
VCT	Voluntary counseling and testing for HIV
WHO	World Health Organization
ZATF	Zonal AIDS Task Force

# EXECUTIVE SUMMARY

## Introduction

The United Nations Millennium Project identified the large-scale training and deployment of community health workers (CHWs) as an important strategy to fill the human resources gap and achieve the Millennium Development Goals (MDGs). However, CHW programs are known to be fraught with significant human resources challenges. The USAID Health Care Improvement Project (HCI) developed the Community Health Worker Assessment and Improvement Matrix (CHW AIM) to help assess CHW program functionality and to provide benchmarks against which to measure program improvements.

Zambia's large number and wide range of CHWs and the government's openness to CHWs and recognition of their value made it an ideal country in which to conduct the CHW AIM operations research (OR). The OR focused on CHWs supported by five different implementing partners in Zambia. The CHWs included in the assessment fell under the category of "community health volunteer" identified by the Zambian National CHW Strategy, but also met a broader definition embraced by the CHW AIM tool that included: "*any health worker that performs a set of essential health services who receives standardized training outside the formal nursing or medical curricula and has a defined role within the community and the larger health system*" [19].

Three key questions thus formed the foundation for the CHW AIM operations research activity:

- 1) Does application of the CHW AIM tool contribute to CHW program functionality improvement?
- 2) What is the relationship among program functionality, CHW engagement and CHW performance?
- 3) What are the costs associated with implementing the CHW tool and what is the incremental cost effectiveness associated with its use?

## Methodology

The CHW AIM operations research activity was designed as a field intervention study that applied the CHW AIM process twice over 13 months. It included a sample of six organizations (five intervention sites and one control site) and 156 CHWs. The CHW AIM process was applied at five organizations; engagement was assessed at all sites through an engagement survey, which was complemented with an in-depth engagement interview; CHW performance (task completion) in two HIV/AIDS service delivery areas that CHWs commonly provide, positive living and ART adherence counseling, was also assessed at all sites through analysis of service delivery audio recordings. The study team collected additional data on program design, results and costs. Costs related to training, incentives, and supervision were documented for a 25-month period, 12 months prior to the study and the 13 months of the intervention. HCI covered the costs of the CHW AIM workshops and expenditures were closely tracked to document the cost of implementing the one-day workshops.

Data were collected between October 2010 and November 2011. Ten data collection instruments were used to collect a variety of qualitative and quantitative data on CHW program functionality, CHW program structures and experience, CHW engagement, CHW performance and program costs and clients served.

The protocol and tools were approved by IRBs inside and outside of Zambia as well as the Zambia ministry of health. Participation in the operations research was entirely voluntary and confidential and no names or client specific information were documented.

Data were entered into Microsoft Access and Excel databases and imported into SPSS for statistical analysis. Correlations between CHW AIM, CHW performance and CHW engagement were analyzed using bivariate analysis (Pearson Correlation). Multivariate linear regression and two-step cluster analyses were conducted to identify the variables that most strongly influence performance and describe

the characteristics of better performing CHWs. Qualitative analysis was used for CHW AIM workshop action plan, program manager and CHW interview.

## Results

The results indicate that the CHW AIM process contributed to program functionality improvement, but that improvement was neither linear nor consistent. Only two organizations improved their total program functionality scores, but every organization made gains in at least two program functionality elements that were direct results of plans made in response to findings of the first CHW AIM workshop. Important and positive changes were made in almost all of the CHW AIM elements.

CHWs demonstrated “low performance” (<39%) in four of six sites at baseline and moderate performance (40-69%) in only two sites. At endline, CHWs demonstrated moderate performance in four sites, for CHWs with matching baseline and endline data. There is a positive correlation between CHW AIM scores and performance, but a number of other factors also correlated positively with performance. These other factors included the time CHWs spent with clients (based on recording times), days of initial training (from CHW interviews), months worked as a CHW (from CHW interviews), average hours worked (as reported in CHW interviews), the type of incentive the CHW was provided (in-kind or cash), the value of CHW incentives, and three of the 15 CHW AIM elements.

Five variables were analyzed using a multivariate linear regression analysis to determine which most significantly correlated with performance. The type of incentive provided, whether in-kind or in cash, correlated most strongly with performance. The second variable that correlated significantly with performance was service delivery time. CHW AIM also correlated with performance, but not as strongly as incentive type or service time. Finally, incentive amount had a statistically significant, but negative, correlation with performance and days of initial training, when compared with other variables, showed no statistical significance related to performance.

Two-step cluster analysis revealed two principal subpopulations of CHWs. Cluster 2, the moderate and high performers, has a service delivery time almost three times greater than that of Cluster 1, had twice as many initial training days, works more than three times as many hours as CHWs in Cluster 1, has slightly higher engagement relative to Cluster 1 and, based on CHW AIM scores, is affiliated with more functional CHW programs.

CHWs were engaged but there was no consistent correlation between total CHW AIM scores and engagement. There was also no statistically significant correlation between engagement and performance. Three CHW AIM elements showed a positive correlation with engagement.

One-day CHW AIM workshops were fairly inexpensive. HCI spent between \$356 and \$1136 per workshop with total average costs of \$371 to \$1064. Costs per participant ranged from \$16.91 to \$56.00. This study sought to test out the cost effectiveness of the CHW AIM process. However, cost and program output data in terms of numbers of clients served by CHWs and in terms of outcomes, such as defaulter rates, were either unavailable or too weak or limited to support a cost effectiveness analysis. Volunteer CHW models are not necessarily less costly, especially if organizations feel they cannot demand much of volunteers in terms of service delivery. Incentives paid to CHWs among sample sites varied significantly and were, for the most part, not founded on work or workload. Overall, CHW incentives are not calibrated to work expectations.

## Conclusions and Recommendations

Organizations felt the CHW AIM process was useful and helped them take stock of their program and develop constructive actions to address issues. While measures of improvement captured through this study are inconclusive, the stories of improvement that come out of this study suggest that the tool can catalyze improvement. There is a statistically significant correlation between CHW AIM scores and CHW performance, suggesting that organizations that have stronger CHW AIM scores are also likely to

have better performing CHWs. There is only a weak correlation between CHW AIM and engagement and no correlation between engagement and performance. However, several CHW AIM elements correlate strongly with higher levels of engagement. These include individual performance assessment, opportunities for advancement and incentives. Organizations with stronger systems in these three areas are likely to have more engaged CHWs.

Performance varied greatly among organizations. However, overall performance was only moderate to low. The type of incentive provided, cash versus in-kind, showed the strongest correlation with performance. The time spent with clients also correlated strongly with performance as did CHW program functionality (total CHW AIM scores), but not with a lower significance level. The data suggest that paying CHWs and providing them the information, skills and environment they require to spend the required time with each client will improve performance. It also indicates that organizations with stronger CHW Aim scores are more likely to have better performing CHWs than those with lower CHW AIM scores.

Organizational investments in CHW programs varied greatly among sites that participated in the study. Organizations do not systematically track costs of supervision visits and data on clients served by CHWs, often does not accurately reflect the workload of CHWs either because a total number of clients is tracked and not client visits per CHW or because an aggregate number of clients are tracked who may be seen by CHWs or another provider. In addition, outcome indicators, such as reductions in defaulter rates, are frequently not tracked by organizations that support CHWs so the cost effectiveness of programs relative to the outcome of their efforts cannot be calculated. The value of incentives paid per CHW also varied greatly, but these cannot be interpreted alone. The hours CHWs are expected to work and the number of clients served must be considered when analyzing incentive payments. The CHW AIM process is fairly inexpensive to implement and should be feasible for most organizations to fund if it is incorporated in project plans and budgets.



## I. INTRODUCTION

The shortage of health human resources presents a major obstacle to the scale-up of health programs. The 2006 World Health Report estimated a shortage of 4 million trained health workers globally with sub-Saharan Africa needing to increase the health workforce 140 percent to meet staffing requirements<sup>[1]</sup>. The high-level Taskforce on Innovative Financing for Health Systems calculated that the health workforce in low-income countries needs to double to reach the Millennium Development Goals (MDGs) by 2015, adding 3.5 million health workers, a majority of which (49 percent) would be nurses and midwives, or community health workers (27 percent)<sup>[2]</sup>. Governments are expanding training programs, but it will take years to get enough trained professional health providers into the workforce and issues of deployment and distribution remain challenges, with critical shortages persisting in rural and hard-to-reach areas<sup>[3][4]</sup>.

The United Nations Millennium Project identified the large-scale training and deployment of community health workers (CHWs) to provide specific health services as an important strategy to fill the human resources gap and achieve the MDGs<sup>[5]</sup>. Reviews of CHW programs have shown that CHWs can contribute to improving maternal and child health<sup>[6][7][8][9][10][11]</sup>, and expand the reach of HIV/AIDS care and treatment services<sup>[12][13][14][15][16]</sup>. However, CHW programs are also known to be fraught with significant human resources challenges including: high turnover, low motivation, lack of support and supervision, irregular or insufficient compensation, feelings of disempowerment, low status or lack of recognition by qualified providers, lack of community support, and unclear links between inputs and outcomes<sup>[7][12][13][17][18]</sup>. If CHWs are to contribute effectively to the realization of the MGDs, then these issues will need to be addressed.

There is no single intervention or uniform remedy to the challenges faced by CHW programs. The contexts in which CHWs work and the issues they address are diverse and require tailored solutions. The USAID Health Care Improvement Project (HCI) developed the Community Health Worker Assessment and Improvement Matrix<sup>1</sup> (CHW AIM)<sup>[19]</sup> to help assess CHW program functionality and to provide benchmarks against which to measure program improvements. Program functionality is defined largely, though not exclusively, from a human resources perspective. The elements delineated in the CHW AIM tool include critical CHW human resources factors such as recruitment, role definition, training, supervision, and incentives, but also some more general program elements such as linkages to the general health system and country ownership.

### A. Study Context

Although Zambia is a relatively stable country that witnessed a landmark peaceful democratic election in 2011, it faces considerable health challenges for its population of 13 million. According to the World Health Organization (WHO) World Health Report 2011, HIV/AIDS prevalence in the adult population is 13.5 percent. Average life expectancy in Zambia is a mere 48 years. Neonatal mortality is 35 per 1000 live births, while infant and under-five mortality are also high at 86 and 141 per 1000 live births respectively<sup>[20]</sup>.

Zambia also faces significant shortages in its health workforce. It is estimated that Zambia has only half the health workforce it needs.<sup>[21]</sup> Vacancies have been estimated at 42 percent in rural health centers, 22 percent in urban health centers and 41 percent in hospitals<sup>[22]</sup>. Vacancies among nursing cadres, the most prevalent clinical care cadre in Zambia, are 55%, clinical officers 63% and doctors 64%<sup>[23]</sup>. As in many resource-poor countries, distribution of the health workforce is also highly uneven, with rural

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<sup>1</sup> The CHW AIM toolkit originated out of USAID's mandate to add 100,000 functional maternal and child health (MCH) community health workers by 2013 in 30 USAID MCH priority countries. It is designed to provide a rapid assessment of community health worker (CHW) programs to help policy makers and donors count functional health workers and identify strong programs.

areas facing a more significant shortage than urban areas and some provinces and districts experiencing much greater shortages than others [22].

The Zambian Ministry of Health is cognizant of its human resources challenges and has been among the more proactive governments in trying to address critical shortages of health workers. The government has initiated a number of programs to enable health workers to upgrade their skills, increase training institutions, enlarge recruitment into medical training colleges and, most importantly for this study, to expand the recruitment and involvement of community health workers in the health sector. The government developed a national CHW Handbook in 2005 to provide some guidelines for CHW work and training [24]. In 2010 the Ministry of Health published a National Community Health Worker Strategy [23]. This strategy was preceded by an assessment of CHWs and CHW programs that estimated there were 23,500 CHW active throughout Zambia [23]. These CHWs contributed to a number of different health programs and were supported by numerous partners and programs under an equally diverse array of models. The assessment also noted that CHW training varied greatly in content and duration, 97 percent of the programs assessed did not provide follow-up training, and many district medical officers felt that existing CHWs were ill prepared to carry out their duties [23].

In line with the national objective to “bring basic health services closer to the family” [23], the Zambian National CHW strategy laid out the government’s plan to initiate a formal cadre of CHWs. These new CHWs will have a minimum education of 12<sup>th</sup> grade and two “O” levels; they will also be trained for a year, be paid; and be stationed at health posts from which they will conduct community outreach and provide a broad spectrum of basic health services. These new government CHWs will not replace the wide variety of community health workers (which the strategy distinguishes as “community health volunteers”), but will “supplement and enhance” their efforts [23].

At the time the CHW AIM operations research activity was initiated, the government of Zambia was finalizing its National CHW Strategy. Members of the study team held discussions with the Clinton Health Access Initiative, which was assisting the government to develop and roll out the strategy, but both parties agreed that the national program was not yet ready to participate in the CHW AIM operations research. However, Zambia’s large number and wide range of CHWs and the government’s openness to CHWs and recognition of their value, made Zambia an ideal country in which to conduct the CHW AIM operations research. The operations research thus focused on CHWs supported by five different implementing partners in Zambia. The CHWs included in the assessment fell under the category of “community health volunteer” identified by the Zambian National CHW Strategy, but met a broader definition embraced by the CHW AIM tool that included: *“any health worker that performs a set of essential health services who receives standardized training outside the formal nursing or medical curricula and has a defined role within the community and the larger health system”* [19].

## **B. Study Questions**

The theory underlying the CHW AIM tool is that by applying the tool and addressing program weaknesses identified through the process, organizations will be able to improve the functionality of their CHW programs. The purpose of the CHW AIM Operations Research activity was to test this hypothesis. Prior to the initiation of this study, the CHW AIM tool was field tested in Nepal and Benin and had been used by several organizations, including WHO, as an evaluative tool to assess the functionality of a number of different CHW programs. The tool had not yet been used repeatedly over time to see if it contributed to program improvement. Three key questions thus formed the foundation for the CHW AIM operations research activity:

- Does application of the CHW AIM tool contribute to CHW program functionality improvement?
- What is the relationship between program functionality, CHW engagement and CHW performance?
- What are the costs associated with implementing the CHW tool and what is the incremental cost effectiveness associated with its use?

By investigating these three questions, HCI sought to better understand the effectiveness of the tool as an improvement instrument, whether program functionality is associated with performance and engagement, and whether the costs of the process could be supported by organizations.

## II. METHODOLOGY

### A. Study Design

The CHW AIM Operations Research activity was designed as a field intervention study. The operations research applied the CHW AIM process twice in a period of 13 months. It included a sample of 156 CHWs (19 to 29 per organization) that was assessed for engagement and performance. The term engagement describes an employee's state of mind when she is satisfied with her job, motivated to do the work, and committed to doing it well. Engagement was assessed through an engagement survey, which was complemented with an in-depth engagement interview designed to gather descriptive data on engagement related to survey questions. Both the survey and interview were administered in coordination with the CHW AIM workshops at baseline (BL) in October 2010 and at endline (EL) November 2011. CHW performance (task completion) in two HIV/AIDS service delivery areas that CHWs commonly provide, positive living and ART adherence counseling, was also assessed at baseline and endline. The study team collected additional data on program design, results and costs. Costs related to training, incentives, and supervision were documented for a 25-month period, 12 months prior to the study and the 13 months of the intervention. HCI covered the costs of the CHW AIM workshops and expenditures were closely tracked to document the cost of implementing the one-day workshops.

The study team conducted initial interviews with program managers to gather information about the program structure, the types of CHWs the program supports, the objectives of the program, and incentives, training and supervision provided to CHWs. These initial interviews were followed up with a mid-term (MT) survey and endline interview of program managers to document any major changes in the programs, such as loss or increase of funding, changes to CHW incentives, as well as changes implemented based on the CHW AIM action plans.

### B. Sampling

#### 1. Sampling of organizations

We identified six organizations to participate in the study (Table I).

Five organizations were intervention sites where the CHW AIM process was implemented and program, cost, engagement and performance data were collected. Site 6 was identified as a control site.<sup>2</sup> At the control site, the CHW AIM process was not implemented, but engagement and performance data were collected. Purposive sampling methods were used to identify the organizations and districts included in the study. Participation in the study was voluntary. Criteria were defined for participating organization eligibility. These criteria included:

1. Organizations with CHWs providing either positive living or ART adherence counseling.
2. Representation of different types of organizations, such as local non-governmental organizations (NGOs), faith-based organizations (FBOs), international organizations, and/or government.
3. A diversity of program sizes was also sought from small, local programs to national programs.

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<sup>2</sup> The control site lost funding in December 2011. It thus failed to serve as a viable control to measure the any added benefit of the CHW AIM process on performance or engagement as the loss of funding resulted in a cessation of incentive payments to CHWs. Nonetheless, performance and engagement data from Site 6 were included in the general study analysis, but were not used in the comparisons with CHW AIM scores, since CHW AIM was not implemented at Site 6.

**Table 1: Participating organizations and their CHW programs**

Site	Organization type	CHW Program Scope	CHW AIM impl. level	Total CHWs in District		HIV/AIDs service Assessed for Performance*	Incentives
				BL <sup>1</sup>	EL <sup>1</sup>		
1	International FBO	National	District	289	405	ART Adherence (follow-up)	In Kind
2	International FBO	National	District	60	62	ART Adherence (follow-up)	In Kind
3	Local FBO	Local	District	63	40	ART Adherence (follow-up)	Travel Allowance
4	International NGO	National	District	43	24	ART Adherence (initiation) ART Adherence (follow-up)	Travel Allowance
5	Regional NGO	Provincial	Multi-District	49	ND	Positive Living Counseling	Salary
6	Local FBO	Local	District	40	27	ART Adherence (follow-up)	Travel Allowance

\*CHWs in site 1, 2 and 6 also provided positive living counseling, but too few recordings of this service were collected to adequately assess performance. Performance analysis was thus limited to ART adherence follow-up

<sup>1</sup> BL denotes baseline and EL denotes endline.

4. Programs included in the study had to be operational for a minimum of 12 months prior to the initiation of the study, with CHWs that had initial training at least 12 months prior to the start of the study.

5. A sample of organizations providing a diverse range of CHW incentives was sought.

6. A major convenience consideration was that organizations operate in the same country, preferably a PEPFAR country, and ideally within a reasonable radius of one another to facilitate access, shorten the time required to collect data, and manage costs.

A Memorandum of Understanding was signed with each organization outlining the expected inputs of the organizations and those of HCI. Organizations were responsible for providing CHW lists, identifying and inviting participants to CHW AIM workshops, participating in interviews, and facilitating the distribution and collection of digital voice recorders for the performance recording process.

Several of the organizations operated in large geographic regions. To narrow down the area of intervention, the study focused on one district for five of the organizations and in a region (multi-district) for one organization. Concentration on districts was necessary to keep the implementation area focused and costs reasonable, and to facilitate travel and follow-up for CHW engagement and performance surveys. For the one regional application of the process, CHWs and CHW representatives were brought together in a single location to enable interviews and make implementation of the CHW AIM workshop practical.

## 2. Sampling of CHWs

While sampling of organizations relied on non-probability-based, purposive considerations, selection of CHWs for participation in the program used both stratified and systematic methods. We selected a sample of 30 CHWs from each participating organization with the assumption that as many as 10 might be lost before the end of the study either due to migration, illness, or another reason. As displayed in Table 1, the total number of CHWs in the districts ranged from 40 to 289 at the start of the study. Site 1 had the largest number of CHWs (289); the remaining five sites had between 40 and 63 CHWs.

To obtain a representative sample of CHWs operating in the district for each organization, complete CHW lists were stratified by location and gender and a representative sample of each was selected. Each CHW was assigned a unique code. Codes linked the CHW engagement interview, engagement

questionnaire and CHW performance recordings so that results could be compared. Codes were kept confidential and were not provided to organizations or to the CHWs.

Table 2 shows a list of the number of CHWs assessed per organization at baseline and endline.<sup>3</sup>

**Table 2: CHW sample**

Site	Baseline			Endline		
	Total	Female	Male	Total	Female	Male
1	27	20	7	23	17	6
2	27	15	12	23	12	11
3	19	17	2	17	16	1
4	28	17	11	24	15	9
5	29	29	0	22	22	0
6	26	17	9	23	13	10
Total	156	115	41	132	95	37

<sup>3</sup>Site 5 supports only female CHWs.

The baseline and endline totals refer to the total number of CHWs who showed for interviews and engagement surveys. In Site 3 only 25 CHW were included in the sample because the organization had only 25 CHWs trained and active for 12 months. CHWs in other organizations were either no longer active or failed to attend the interview. As a result, 156 CHWs were assessed at baseline and 132 at endline. The greater proportion of female CHWs relative to male CHWs (roughly 3:1) shown in Table 3 is reflective of actual ratios in these organizations. As in many CHW programs, the majority of CHWs are female.

### C. Data Collection

Data were collected in Zambia between September 2010 and December 2011. A Local Research Coordinator and Data Collection Assistant conducted engagement interviews and surveys and instructed supervisors on how to collect performance recordings. The Principal Investigator and Local Research Coordinator conducted the CHW AIM workshops and collected program and cost data from program managers. A local Data Manager with expertise in HIV/AIDS analyzed the performance recordings along with the Research Coordinator. Cross checking of a selection of forms was conducted to ensure accuracy and consistency of data recording.

### 3. Tools

Ten different tools were used for this study (Table 3). All tools were applied at baseline and at endline. Mid-term data were collected (electronically) from organizations through a program manager survey and a cost assessment. The number collected for performance assessments refers to the number of performance recordings for individual service delivery sessions collected; CHWs were requested to provide two recordings each at baseline and at endline.

### 4. Data collection methods

#### **Program data**

Program data were collected through interviews with program managers and their key team members and record reviews. A program manager interview was conducted the day preceding the baseline CHW

<sup>3</sup> Note: this list represents the sample of CHWs who completed the CHW engagement survey and interview; numbers that contributed performance recordings may differ and are provided later in this report.

**Table 3: Data collection tools**

No	Tool	Method	Number Collected*			
			BL	MT	EL	TOTAL
1	Program Manager Interview	Interview/survey	5	5	5	15
2	Program Data Review	Record review	5	----	5	10
3	CHW AIM Tool	Participatory workshop process	5	----	5	10
4	CHW Validation Questionnaire	Interview	50	----	50	100
5	CHW Engagement Survey	Survey	156	----	132	288
6	CHW Engagement Interview	Interview	156	----	132	288
7	ART Adherence Support Counseling (Initial) Performance Assessment	Audio task analysis	20	----	11	31
8	ART Adherence Support Counseling (follow-up) Performance Assessment	Audio task analysis	185	----	120	305
9	Positive Living Counseling Performance Assessment	Audio task analysis	38	----	35	73
10	Program Cost Assessment	Survey	4	3	3	10

\*BL = baseline, MT = mid-term, EL = endline

AIM workshop, and a program manager survey was sent to program managers in July 2011. A follow-up interview was conducted during the endline CHW AIM workshop in November 2011.

Data on program indicators or targets were collected through discussions with managers and a joint review of project records and databases. For the program data, information was collected on types of services provided by CHWs, numbers of CHWs providing each service, hours CHWs are expected to work per week, indicators and targets, and actual achievements to date. Data were collected for the 12 months preceding the CHW AIM process and then for the 12 months afterwards.

### **CHW AIM**

The Principal Investigator and Local Research Coordinator facilitated one-day CHW AIM participatory workshops with each organization using the CHW AIM tool and guidance.<sup>[19]</sup> Organizations were provided with an invitation guide that recommended 20 participants with equal representation from program management, CHWs and key stakeholders. Key stakeholders could include community committees, District AIDS Taskforces, District Health Management Teams, health facility staff or any other key partners the organization thought important to include in the process. HCI covered the costs of the one-day workshop. Organizations were asked to propose venues and set transportation reimbursement costs based on what organizations would usually pay and be able to sustain. In a few cases, accommodation for headquarters representatives and, in one case CHWs, was also required.

The purpose of the workshop was to apply the CHW AIM tool. This is a process in which organizations and their partners assess their performance in 15 program functionality elements using a four-level scoring system (0 to 3) (A workshop agenda is included in Appendix 1). Criteria for each level are defined for each element in the tool. A score of 0 indicates no or very low capacity, while 3 indicates the best practice (Table 4). To be considered functional, organizations must score at least 2 in every

element. The tool also includes a separate list that includes a number of different HIV/AIDS intervention areas. Organizations must have at least one complete intervention area to be considered functional.

**Table 4: CHW AIM scoring criteria**

Tool	Measure	Score	Assessment
CHW AIM	Score per element	3	Best practice (highly functional)
		2	Functional but with room for improvement
		<2	Not functional

Prior to the workshop, researchers reviewed the HIV/AIDS intervention matrices with program managers. Managers completed the matrix and this completed matrix was then shared with the CHW AIM workshop participants following the scoring process. A complete review of the matrix was conducted for the baseline, but only a review of any changes or modifications was done for the endline.

Finally, throughout the CHW AIM workshop, in addition to participating in the scoring and intervention matrix review, participants kept lists of issues and actions which they developed into improvement action plans during the workshop. The stories of change and improvement included in the discussion section of this report are largely derived from qualitative data gathered during the CHW AIM scoring and action planning discussions.

### **Engagement**

All CHWs included in the sample were given an engagement survey and interview. The survey included a list of sixteen statements associated with CHW engagement and CHWs were asked to provide their level of agreement with the statement using a five-point Likert scale [25]. Criteria for measuring engagement are presented in Table 5.

**Table 5: Engagement measures**

Tool	Measure	Result	Assessment
CHW Engagement Survey	Average score	4 to 5	Engaged
		3 to 3.9	Not engaged
		<3	Actively disengaged

The in-depth engagement interview gathered descriptive information related to the sixteen questions in the engagement survey. This was important to provide explanations for survey results and to enable researchers to triangulate the CHW engagement survey results with the CHW AIM results. The interview also gathered data on how long the CHW had been active with the organization, hours worked and training history with the organization. Related to the sixteen questions, the interview asked about CHW understanding of program objectives, knowledge of supervisor and last supervisory visit, community support provided, recognition received, relationships with managers, incentives and satisfaction with incentives, and most satisfying and frustrating aspects of being a CHW.

### **Performance**

To assess performance, a list of key tasks was developed using international [26] and national [27][28][29][30][31] guidelines for ART adherence support and positive living counseling. In all, three tools made up the assessment: 1. ART adherence counseling (initial); 2. ART adherence counseling (follow-up); and 3. Positive living counseling. Both the CHW and the client had to provide consent for the recording to be done.

A task completion assessment for service delivery in either ART adherence support or positive living counseling was conducted through recordings of service delivery. A percentage score was calculated as:

$$\frac{\text{Total number of tasks done}}{\text{Total number of applicable tasks}} = \text{Performance \%}$$

Evaluation of performance consisted of the simple completion of tasks, not how well they were completed. Any misinformation provided was also not captured in the performance assessment. Recordings were uploaded in MP3 format and voice modifications were done using Audacity® audio editing software to ensure CHW and client confidentiality. They were then analyzed using the task forms. Tasks were recorded as either done, not done, or not applicable. Three performance categories were defined. Service delivery that met 70 percent or more of the applicable standard task was defined as a “high performing”, 40 percent and 69 percent was categorized as “moderate performing”, and 39 percent or less was considered “low performing” (Table 6).

**Table 6: Performance measures**

Tool	Measure	Result	Assessment
CHW Performance	Percentage tasks achieved	≥70%	High performing
		40 to 69%	Moderate performing
		0 to 39%	Low performing

### Cost

An Microsoft Excel cost information spreadsheet was provided to program financial managers to complete. The tool requested quarterly expenditure totals for costs related to CHW incentives, CHW training, and CHW supervision. Data were collected for the 12 months preceding the intervention (October 2009 to September 2010) and then for the all quarters included in the intervention (October 2010-September 2011) plus October 2011. Data collectors reviewed the forms with managers or members of the financial management staff and then provided a soft copy of the form for the finance team to complete.

### D. Analysis

Data were entered into Microsoft Access and Excel databases. Access tables were then extracted and imported into SPSS for statistical analysis. Databases were reviewed and cleaned and data validation conducted comparing database entries with a sample of data forms.

Study analysis combined calculations of frequencies and means of the CHW AIM tool and engagement survey results and text coding and analysis of interview questions, with statistical analysis of CHW performance results. A 95 percent confidence interval (CI) was calculated where feasible to show the reliability of the data. Bivariate analysis was conducted using Pearson Correlation (PC) to assess statistical correlations among CHW AIM results, CHW performance and CHW engagement among other factors. Multivariate linear regression analysis was then applied for variables in which some statistical correlation with performance had been identified to determine which factors most positively correlated with better performance. Finally, a two-step cluster analysis was used to determine if specific factors, not identified through bivariate or multivariate analyses were statistically significant among better performing CHWs.

### E. Human Subjects and Ethical Considerations

The CHW AIM operations research protocol and tools were reviewed and approved by the University Research Co., LLC (URC) Institutional Review Board (IRB), the University of Zambia Ridgeway Campus

Biomedical Research Ethics Committee IRB, and the Zambia Ministry of Health Director of Public Health Research.

All organizations participated voluntarily in the CHW AIM Operations Research activity. Tools were shared with organizations prior to the initiation of the study to obtain their inputs and get informed agreement for their use. Each organization signed a Memorandum of Understanding confirming a clear understanding of the scope of the study and of responsibilities of the organization and HCI with regard to the study.

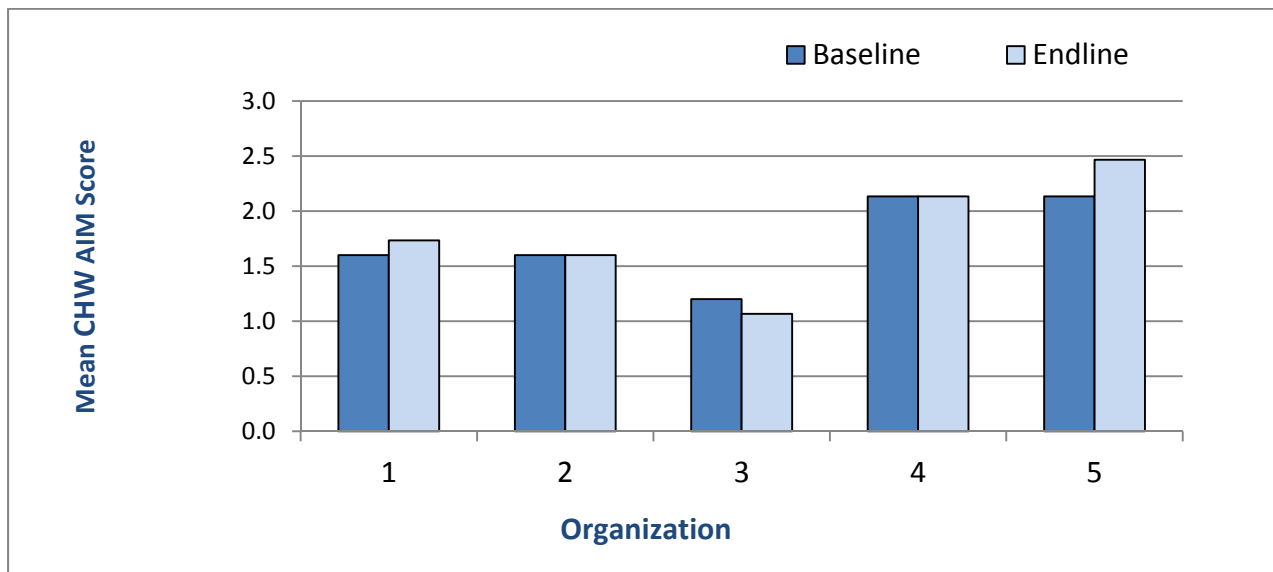
Verbal informed consent was required from all participants including CHW, clients and managers for all interviews, surveys and service delivery recordings. CHWs were required to confirm client consent – in writing on a performance recording register – for recordings to be done. Participation in the study was entirely voluntary and confidential. Neither client nor CHW names were recorded on any forms; all forms were coded and these codes were accessible only by the research team. Only coded information was entered into study databases.

### III. RESULTS

#### A. CHW AIM and Improvement

Overall CHW AIM results suggest that only two organizations improved their total program functionality scores (Figure 1), but every organization made gains in at least two program functionality elements that were direct results of plans made in response to findings of the first CHW AIM workshop (Appendix 2). These gains, however, were typically countered by reductions of scores in some elements, hence resulting in little or no change in total scores.

Figure 1: Mean CHW AIM scores in 15 functionality elements by organization

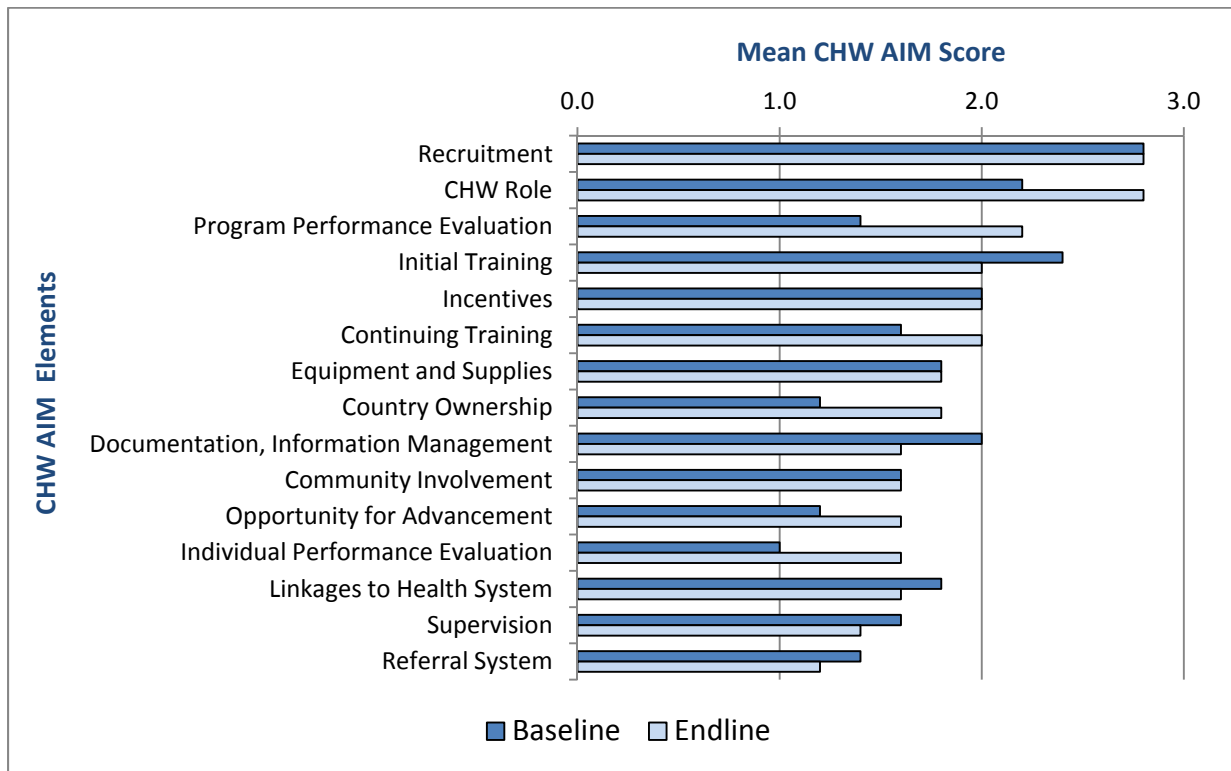


CHW AIM score: 0 = non functional; 1 = partially functional; 2 = functional; 3 = best practice.

Figure 1 compares the average CHW AIM scores for each of the organizations at baseline and endline. Of the five organizations that participated in CHW AIM workshops, only two organizations had a minimum mean score of 2. However, each of these organizations had at least 4 element in both the baseline and endline assessments that received a score of “1”, thus by the CHW AIM program functionality definition, none of the organizations assessed was functional. Differences between mean baseline and endline CHW AIM scores were tested using a Signed-Rank test, and the result was not statistically significant ( $p = 1.00$ ).

While the mean scores suggest no statistically significant improvement, in program functionality between baseline and endline, important and positive changes were made. Some of these changes were evident in the comparative baseline and endline mean scores for individual CHW AIM elements (Figure 2).

**Figure 2: CHW AIM elements ranked from most to least functional (mean, all organizations)**



CHW AIM score: 0 = non functional; 1 = partially functional; 2 = functional; 3 = best practice.

Figure 2 shows mean CHW AIM element scores, by element, ranked from highest to lowest by the endline score. It illustrates that only six of the fifteen elements were functional (had a score of 2 or more) in the endline assessment. The elements of recruitment (2.8) and CHW role (2.8) were the strongest among all organizations, suggesting that most programs are good at recruiting CHWs from the community and defining their role. Program performance evaluation was weak in the baseline (1.4), but moved up to third strongest at the endline (2.2). This is largely due to advances in Sites 1 and 2, both of which experienced a re-start of funding after a 10-month hiatus in the month prior to the baseline, which in effect “re-booted” the record keeping and evaluation systems of their programs. Initial training moved down in rank from baseline (2.4) to endline (2), as several organizations struggled to maintain their initial training systems, but remained a functional element. Finally, incentives (2) and continuing training (2) also came out as “functional” elements in the endline assessment. All other elements scored below a 2, on average.

The three weakest elements at endline were referral systems (1.2), supervision (1.4), and linkages to the health system (1.6). Decreased mean scores in these areas reflect the serious challenges the organizations face in making these systems work for their CHWs.

The CHW AIM workshops revealed numerous issues faced by the organizations. Many of these were documented in the organizations’ action plans. Three of the five organizations had no technical supervision. All seemed to struggle with how to pay for qualified technical supervision and get supervisors to the field as needed. The same organizations also require support for developing supportive supervision tools and service delivery checklists, which also are not in use. Many

organizations also had great difficulty galvanizing substantive community support and ownership for CHWs. Community leaders and members appreciate the services CHWs provide and give them encouragement. Community leaders and members seem less willing to provide incentives or recognize CHWs publicly. Some community leaders expect CHWs to share gifts in-kind or materials provided for nutrition demonstrations with them.

Several elements, although still weak, showed substantial improvement between the baseline and endline assessments. These include: individual performance evaluation (1.0 to 1.6), opportunity for advancement (1.2 to 1.6) and country ownership (1.2 to 1.8).

### ***Program manager assessment of the CHW AIM process***

Program managers who participated in the process felt CHW AIM was a useful tool and all said they would like to continue using the process. Three of five program managers rated the CHW AIM process as “very useful” while two rated it “useful.” None said the CHW AIM process was not useful or was damaging to their program in any way. All program managers felt that their organization should use CHW AIM on a routine basis. However, they noted concerns about cost and felt that an outside facilitator would be advantageous.

Program managers stated that CHW AIM gave them an opportunity to take stock of their CHW AIM program. They also commented that the scoring in the tool helped them compare their program to best practice and that this was a valuable exercise that helped them reflect on what they could do to strengthen their program. One manager also made the important comment that the process should be conducted *before* the annual planning cycle begins so that results can be integrated into annual plans and budgets.

One of the factors managers appreciated about the CHW AIM process was that it provided them an opportunity to connect with partners and CHWs and obtain their feedback and support. They felt the process strengthened their relationship with stakeholders. Stakeholders commented that they were happy to have an opportunity to get to know the organization. CHWs commented that they appreciated having an opportunity to share their views and be listened to by managers and stakeholders.

## **B. Linkages between Program Functionality, CHW Engagement, and CHW Performance**

The second key objective of this study was to understand if there were any correlations among CHW program functionality (CHW AIM scores), CHW engagement and CHW performance. Presented here are first the performance results, then the engagement results and finally the results of bivariate, multivariate and cluster analyses examining associations among performance, engagement and CHW program functionality (CHW AIM results).

### **1. Performance results**

A total of 346 recordings of CHW service delivery were collected from 108 CHWs. Supervisors were asked to collect two service delivery recordings per CHW for all CHWs in the sample at baseline and at endline<sup>4</sup>; 70 CHWs had recordings for both baseline and endline (“matched”). Performance and change in performance were analyzed for all recordings and for those where only matched baseline to endline recordings were available using the one-way analysis of variance through the SPSS-PC routine.<sup>5</sup> Figure 3 displays mean performance per organization for baseline and endline combined. It shows that, overall,

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<sup>5</sup> Some CHWs turned in recordings for services that were not assessed at that site. For example, some recordings were more geared towards positive living in sites where only adherence support was being assessed. These recordings were eliminated from the analysis. Sites 1 and 2 provide both adherence and positive living support, but so few positive living support recordings were delivered that these also were eliminated from the analysis.

Sites 4 and 6 were the best performing sites, while Sites 3 and 1 were among the worst performing. Sites 2 and 5 both had mean performance scores of 38 percent, however Site 2's performance score improved significantly from baseline (33%) to endline (48%) while Site 4's performance remained relatively static (Table 7).

**Figure 3: Mean endline performance by organization\***

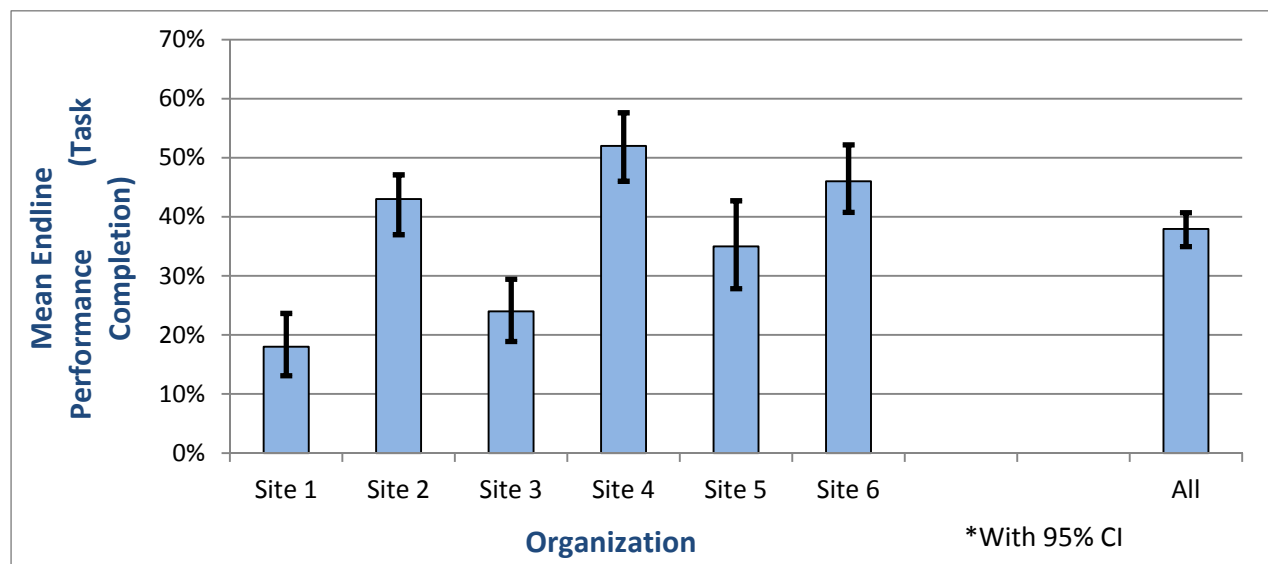


Table 7 compares baseline performance scores to endline performance scores by organization for all CHWs and for CHWs with matched baseline and endline recordings. The column labeled “significance” in Table 7 measures the significance of change in performance from baseline to endline per organizations.

**Table 7: Performance results by organization at baseline (BL) and endline (EL)**

Site	ALL <sup>I</sup>							MATCHED <sup>II</sup>				
	Rec N <sup>III</sup>	CHW N	BL N	BL Perf	EL N	EL Perf	Significance	Rec. N <sup>III</sup>	CHW N	BL Perf	EL Perf	Significance
Site 1	76	24	45	25%	31	18%	0.049*	26	13	28%	19%	0.01**
Site 2	68	22	28	33%	40	43%	0.01**	18	12	35%	49%	0.01**
Site 3	25	9	14	37%	11	24%	0.05*	7	5	36%	24%	0.05*
Site 4 (1)	28	27 <sup>^</sup>	17	60%	11	58%	0.525	7	6	62%	57%	0.504
Site 4 (2)	61		37	43%	24	49%	0.155	15	13	47%	43%	0.491
Site 5	42	22	22	34%	20	35%	0.223	12	10	36%	45%	0.271
Site 6	46	25	23	57%	23	46%	0.144	15	11	56%	48%	0.117
TOTAL N	346	129	186		160			100	70			

<sup>I</sup> Analysis of all baseline and endline tapes

<sup>II</sup> Comparison of performance for only those CHWs for which there is baseline and endline data

<sup>III</sup> Rec. N represents the number of service delivery recordings, whereas CHW N refers to the number of CHWs for which recordings for both baseline and endline (“matched”) exist.

<sup>^</sup> 19 individual CHWs submitted recordings for instrument 1 and 25 individual CHWs submitted recordings for instrument 2. A total of 27 individual CHWs submitted at least 1 recording.

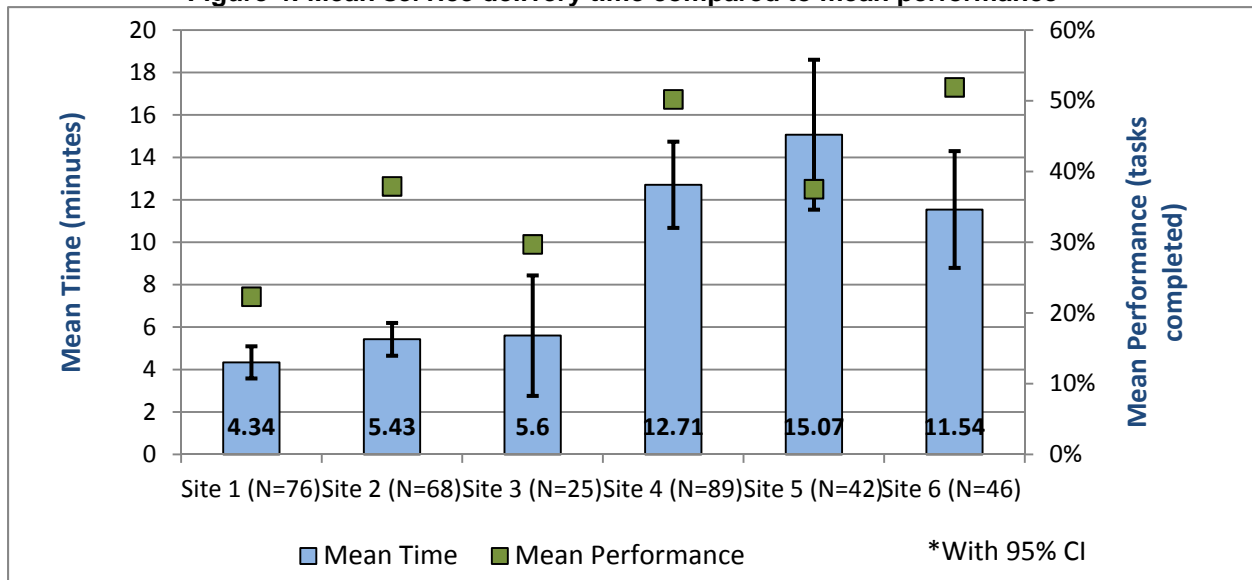
\* =0.05 significance; \*\*=0.01 significance; \*\*\*=0.001 significance

CHWs demonstrated “low performance” (<39%) in four of six sites at the baseline and moderate performance (40%-69%) in only two sites. At no sites did CHWs demonstrate consistently high performance ( $\geq 70\%$ ), though there were some service delivery recordings that met this standard. At endline, CHWs demonstrated moderate performance in four sites, for CHWs with matching baseline and endline data. Site 2 had a considerable and statistically significant improvement in performance, while Sites 1 and 3 showed a decline in performance from the baseline to endline period. Site 3’s performance decline corresponded to declines in CHW AIM scores and declines in engagement scores. Site 1’s performance decline, however, corresponded to increased CHW AIM and engagement scores, the reasons for which are not clear. Changes were evident in Sites 4, 5 and 6 as well, but they were not statistically significant.

While there was great variation in performance across the sites, performance variation within sites, that is, variation in performance among CHWs of the same organization, was relatively similar; standard deviation ranged from 0.147 at Site 3 to 0.177 at Site 5 with the other sites showing roughly 0.15 or 0.16. This indicates that roughly the same degree of performance variation exists in sites with stronger average performance as compared with sites with weaker average performance.

The overall moderate to low performance of CHWs corresponds to very short client contact times. Performance correlated strongly with service delivery time, showing a Pearson Correlation Coefficient of 0.471 and 0.000 significance. Figure 4 compares mean service delivery time to mean performance per organization. The best performing sites, sites 4 and 6, also had the greatest service delivery time, on average more than double that of the three lowest performing organizations. Taken together, 70 percent of CHWs spent less than 10 minutes with clients, and 47 percent spent five minutes or less with clients.

**Figure 4: Mean service delivery time compared to mean performance\***



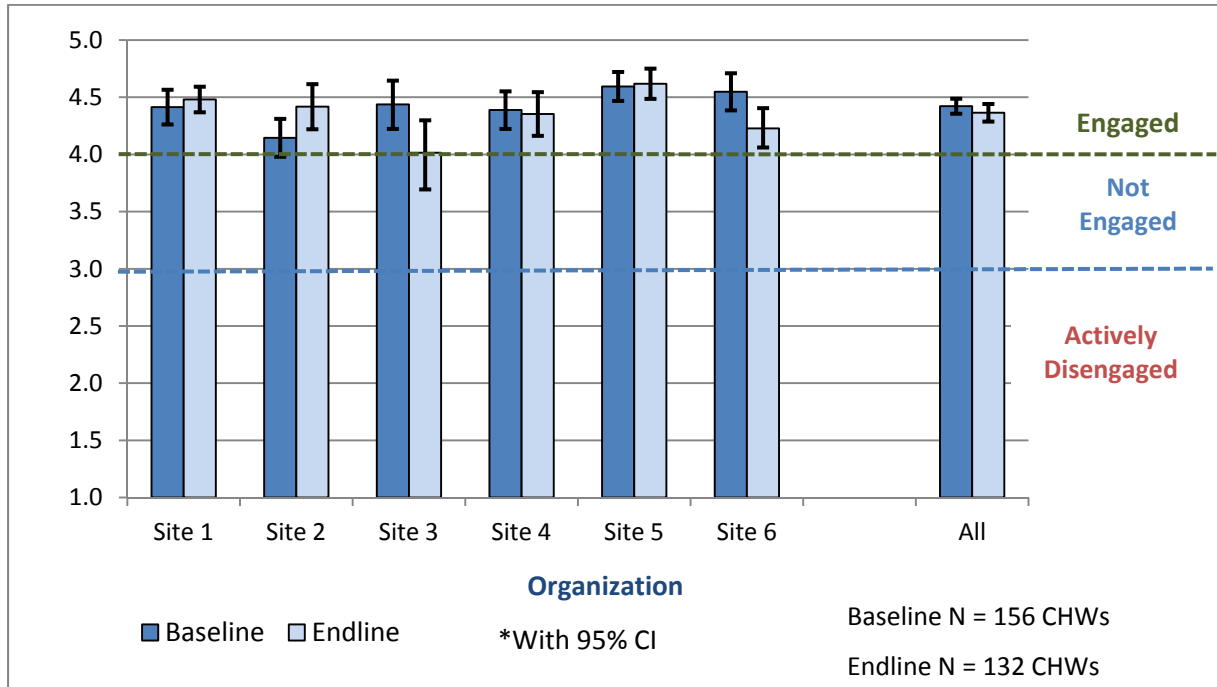
## 2. Engagement results

### Survey results

Engagement surveys were conducted with 156 CHWs at baseline and 132 at endline. Overall, CHWs were actively engaged at baseline and endline, with some observed differences which were not statistically significant. Figure 5 shows levels of engagement at baseline and endline for each of the organizations assessed. A score of 4 or above indicates engagement, 3-4 defines not engaged, and below 3 defines actively disengaged. Sites 3 and 6, both of which lost funding and stopped paying incentives in December 2010, showed the greatest declines in CHW engagement, with Site 3 CHWs barely engaged

at the endline. This result was confirmed through program data, which showed a sharp decline in the number of active CHWs at Site 3 from 63 to 40 and at Site 6 from 40 to roughly 25<sup>6</sup>, and through CHW interviews, during which CHWs expressed a high degree of frustration about losing incentives and not getting program support.

**Figure 5: Mean levels of engagement by organization\***



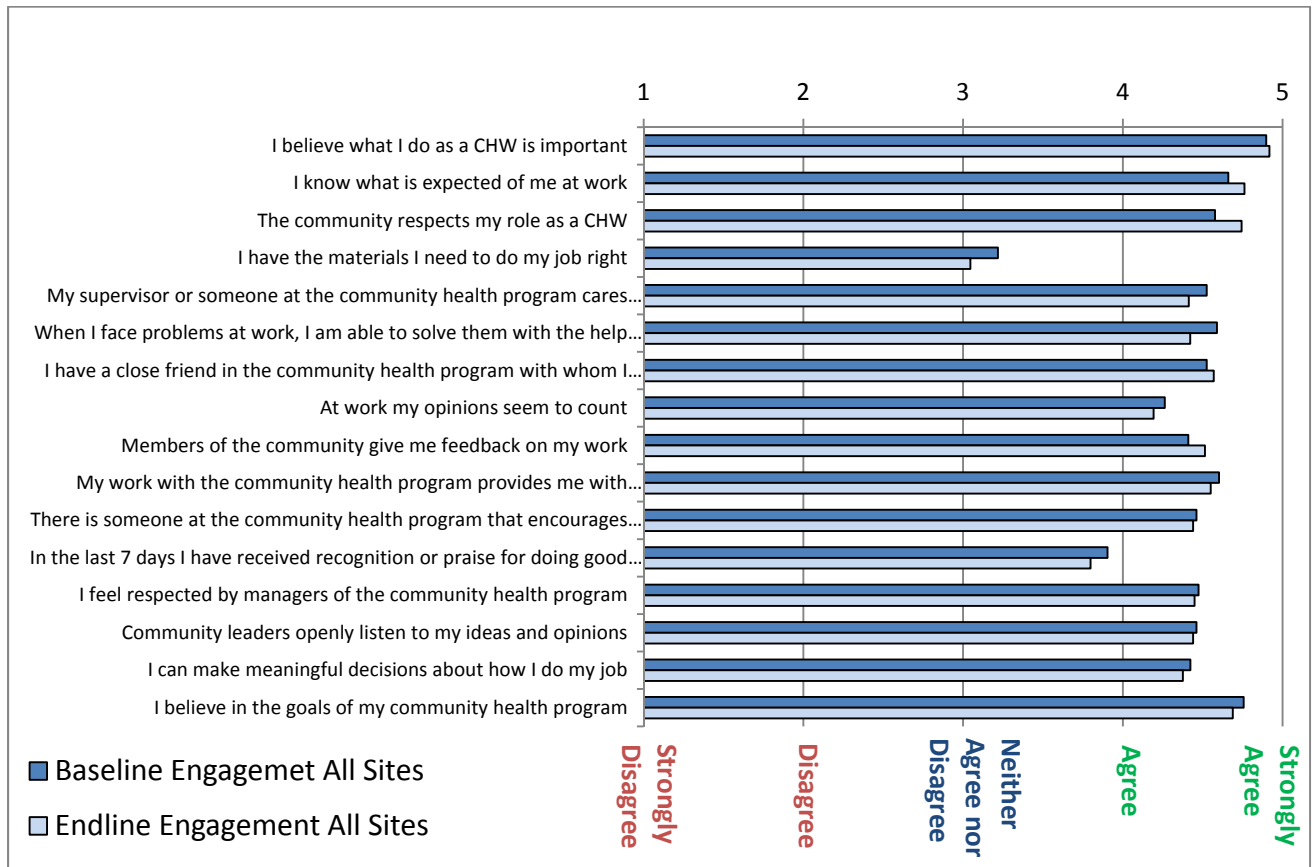
Sites 1 and 5 showed very slight, but not statistically significant, increases in mean engagement scores and site 4 showed a very slight decrease, but differences in these organizations could easily be due to changes in the sample size from baseline to endline rather than any substantive change in the organization or its operations. Site 2 showed a statistically significant increase in engagement ( $p = 0.033$ ). This increase coincides with a statistically significant increase in performance. Site 2's overall CHW AIM score stayed static, but the organization invested a lot in training CHWs following the baseline CHW AIM workshop and this may account for both the increase in engagement and the improvement in performance. Sites 3 and 6 showed statistically significant declines in engagement ( $p = 0.018$  and  $0.008$ , respectively). This reduction in engagement corresponded to declines in performance.

The engagement survey questionnaire contained sixteen statements; responses related to agreement with the statements were organized in a Likert scale. As is shown in Figure 6, analysis of agreement with statements in the CHW engagement questionnaire suggests several areas of strength contributing to high engagement and two significant areas of weakness. All (100%)<sup>7</sup> CHWs reported feeling that their job is important, 99% said they understand what is expected of them, 99% said they feel respected by community members, and 98% said they believe in the goals of the program for which they work. But 53% of CHW surveyed did not feel they had the materials or supplies they need to do their jobs. This was especially evident in Sites 2 and 3. In addition, 72% of CHWs surveyed said they had not received recognition or praise in the last seven days.

<sup>6</sup> No program data were collected at Site 6, the control site, but when the availability of CHWs for the engagement and performance endline assessments was being verified, the program supervisor estimated that only 25 CHWs were active.

<sup>7</sup> Percentages represent values calculated from survey responses for the endline data collection only.

**Figure 6: Mean engagement scores per survey statement**



### Engagement interviews

Engagement interviews were conducted to gather qualitative descriptive data about the CHWs, their experience, and their responses to the 16 survey questions. Table 8 provides descriptive data on the CHWs included in the sample. Some of the descriptive data about CHWs was incorporated in the multivariate analysis of performance. Responses to questions about engagement factors were used for purely descriptive purposes and were not analyzed using statistical methods.

Table 8 shows that most CHWs included in the sample were quite experienced, having worked on average 52 months (over four years). Initial training experience ranged between five and 14 days with two sites, Sites 4 and 5, offering the longest initial training. On average, only 62% of CHWs said they had ever had continuous training. Sites 3 and 5 had the fewest CHWs who had ever had any continuous training (32% in each). There was also a great difference in the average number of hours CHWs reported working per week. CHWs in Sites 1 and 2, who are volunteers, reported working an average of eight hours per week (one day), while CHWs at Site 5 worked an average of 35 hours per week (4.5 days). With regard to compensation, CHWs at two sites, 1 and 2, receive gifts in-kind when available and CHWs at the remaining sites receive cash compensation; Sites 3, 4 and 6 define the compensation they give as a transportation allowance, while Site 5 provides a CHW salary. CHWs at Sites 2 and 6 were most satisfied with the compensation received (48%), while CHWs in Sites 4 and 1 were least satisfied, suggesting that generalizations cannot be made about whether compensation type or amount necessarily make CHWs more or less satisfied.

The engagement interviews also sought to probe CHWs for more descriptive information related to the 16 statements in the engagement survey. For example, if CHWs said they had received recognition, what type of recognition did they receive? If they had opportunities to advance, what were those

**Table 8: CHW characteristics by organization**

Site	Months Worked		Initial Training Days		Continuous Training Days		% Of CHWs Ever had Cont. Training	Median Hours Worked Per week	Compensation Type	Monthly Compensation Amount (USD)	% of CHWs Satisfied with Compensation
	Mean	Median	Mean	Median	Mean	Median					
Site 1	94	96	6.3	5	4.9	5	92%	8	In-Kind	—	25%
Site 2	55	60	5.9	5	5.7	5	81%	8	In-Kind	—	48%
Site 3	33	24	5.5	5	5.3	5	32%	17	Cash	\$60	32%
Site 4	42	42	12	14	2.8	3	68%	22	Cash	\$32	18%
Site 5	28	24	13.4	14	5.8	5	32%	35	Cash	\$105	38%
Site 6	50	48	7.4	5	4.5	5	100%	6	Cash	\$60	48%
All	52	48	8.7	5	4.9	5	62%	16	—	—	35%

opportunities? As shown in Table 9, overwhelmingly, CHWs believed in the goals of the program for which they worked, felt their work was important and were proud to be a CHW. The major reason given by CHWs for why their job was important was that they were “helping the sick”, but many also noted more specifically that they were “saving lives”. Saving lives was also the most common reasons CHWs stated for feeling proud. CHWs also felt respected by the community (98%) and by program managers (95%) and are comfortable sharing their views and opinions with managers (97%). When asked how the community shows its respect, CHWs most commonly said that the community shows respect by calling on them to help sick people. CHWs most commonly cited the way managers speak to them as the indicator of being respected. However, while 95% of CHWs said they felt respected by program managers, only 39% said they are asked by managers for suggestions about how to improve the CHW program.

Three of the areas with the weakest response correspond to weak areas identified in the engagement survey. These include being asked for suggestions to improve the program (39%) corresponding to “my opinions seem to count” in the engagement survey; have received recognition (36%) corresponding to “have received recognition in the last seven days” in the engagement survey, and have the materials and supplies to do work (33%) corresponding to “have the material and supplies to do my job well” in the engagement survey. Only 26% of CHWs interviewed said they had opportunities for advancement, though 82% said they have opportunities to learn new skills.

Finally, only 28 percent of CHWs interviewed said they ever faced problems they had trouble solving, the number was substantially higher (43 percent in Site 2). When asked what problems they had faced, most CHW noted challenges with clients such as clients refusing to go on treatment, adhere to their regimen, alcoholism, lack of nutrition or availability of food for clients, and clients dying before they could get to referral facilities. During interviews many CHWs expressed frustration at having to counsel clients on good nutrition when they had nothing to provide to help the client’s meet their nutritional needs and they knew clients were too poor to get what they required.

### **3. Correlations between CHW AIM, performance, and engagement**

#### ***CHW program functionality, performance, and engagement***

The data suggest a statistically significant correlation between CHW AIM and CHW performance (Table 10 ), indicating that programs with higher CHW AIM program functionality scores are also more likely to have better performing CHWs than organizations with lower CHW AIM program functionality

**Table 9: Mean\* CHW interview responses by organization**

Percent of CHWs who:	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	All	Most Common Reason or Evidence
Feel program goals are important	100	100	100	100	100	100	100	-----
Feel what they do is important	100	97	100	100	100	100	100	Helping the sick
Are proud to work as a CHW	100	100	100	100	100	100	100	Saving lives
Feel respected by community	100	93	100	100	100	97	98	The community calls on me when members are sick
Are comfortable sharing opinions and ideas about work with managers	100	100	89	94	99	100	97	-----
Feel respected by program managers	98	98	86	88	100	100	95	Managers speak respectfully to me
Have been visited by a supervisor in last 3 months	94	95	86	95	100	98	94	Provided guidance on work
Are given feedback by community	98	79	92	95	98	82	90	Provides information about clients' health
Have opportunities to learn new skills	85	84	82	72	74	98	82	Various: from home-based care (HBC) to nutrition to palliative care
Feel have a say in how they do their job	66	74	83	77	79	95	79	I know what to do and plan my own activities
Feel supported by community	73	55	75	85	98	85	78	The community encourages me
Are asked for suggestion to improve CHW program	30	40	41	34	69	22	39	-----
Have received recognition for what they do	75	51	8	25	45	12	36	Received a certificate
Have the materials or supplies to do work	17	2	24	41	94	20	33	Various: ranged from notebooks to home-based care kits
Have opportunities to advance	34	7	14	8	81	12	26	To a more senior CHW position (team leader, CHW coordinator, etc.)
Have faced a problem they had trouble solving	30	43	22	31	16	30	28	Problems with clients resisting treatment, care or having trouble getting needs met

\*Mean of baseline and endline responses

**Table 10: Correlations of CHW AIM with performance**

CHW AIM	Performance		
	N	Pearson Correlation Coefficient	Significance
Baseline CHW AIM Score	164	0.443	0.000 ***
Endline CHW Aim Score	138	0.237	0.005 **

NS=no significance; \*0.05 level significance; \*\*0.01 level significance; \*\*\*0.001 level significance

scores. CHW AIM scores correlated with performance at both baseline (0.443) and endline (0.237), though the strength of the correlation at baseline was stronger. This correlation was also evident in the multivariate analysis, which will be discussed in greater detail later.

The data on CHW AIM and CHW engagement (Table 11), on the other hand, were ambiguous. There was no statistical correlation between CHW AIM scores and engagement for baseline results (0.108) but a statistically significant correlation at endline (0.000) Likewise, the baseline Pearson Correlation Coefficient shows a weak correlation (0.142), and the endline, a moderately strong correlation (0.345). This suggests that CHWs in organizations with stronger CHW AIM program functionality scores may not be any more engaged than CHWs in organizations with weaker CHW AIM program functionality scores.

**Table 11: Correlations of CHW AIM with engagement**

CHW AIM	Engagement		
	N	Pearson Correlation Coefficient	Significance
Baseline CHW AIM Score	130	0.142	0.108 NS
Endline CHW Aim Score	109	0.345	0.000 ***

NS=no significance; \*0.05 level significance; \*\*0.01 level significance; \*\*\*0.001 level significance

In multivariate analysis, total engagement scores had no statistical correlation with performance, suggesting that the total engagement score is not associated with performance and may be only marginally linked to CHW program functionality.

#### 4. Factors that correlate with better performance

##### ***Bivariate analysis***

There is a positive correlation between CHW AIM scores and performance, but a number of other factors also correlated positively with performance. These other factors include the time CHWs spent with clients (based on recording times), days of initial training (from CHW interviews), months worked as a CHW (from CHW interviews), average hours worked (as reported in CHW interviews), the type of incentive the CHW was provided (in-kind or cash), the value of CHW incentives, and three of the 15 CHW AIM elements. Table 12 displays the variables with statistically significant (i.e., p value < 0.05), positive association with performance. A complete table of all the variables analyzed is provided in Appendix 3.

The strongest correlations were country ownership (0.456 and 0.566) and service delivery time (0.471). Programs that felt stronger support and ownership of the MOH for their program tended to have better performing CHWs. Likewise, CHWs who spent a longer time with clients also had better performance (task completion).

**Table 12: Variables that correlate with performance**

Variables	Positive Correlation	Assessment	N	Pearson Correlation Coefficient	Significance
CHW AIM scores and CHW AIM Element scores	Overall CHW program functionality	BL	163	0.443	0.000
		EL	138	0.237	0.005
	Continuous Training	BL	163	0.161	0.040
		EL	137	0.442	0.000
	Equipment and Supplies	BL	163	0.350	0.000
		EL	137	0.470	0.000
Country Ownership	BL	163	0.465	0.000	
	EL	137	0.566	0.000	
Other Variables	Service delivery time	-----	300	0.471	0.000
	Days of Initial Training	-----	345	0.248	0.000
	Incentive Type	-----	300	0.363	0.000
	Incentive amount	-----	300	0.148	0.010

CHW AIM program functionality (0.443 and 0.237) and equipment and supplies (0.350 and 0.470) also showed robust correlations with CHW performance. The strength of the correlation between CHW AIM and performance decreased from the baseline to the endline, though the reasons for this decline are not clear. There were a number of elements that had inconsistent, weak or no correlation with CHW performance. A complete table of all the variables analyzed is provided in Appendix 3.

### **Multivariate analysis**

The bivariate analysis revealed eight factors that correlated with CHW Performance (Table 12). Five of these variables<sup>8</sup> were then analyzed using a multivariate linear regression analysis to determine which most significantly correlated with performance. The five variables included: CHW AIM program functionality, incentive type, service time, incentive amount, and days of initial training. As Table 13 shows, almost 32% (adjusted R squared) of performance variation can be explained by these five variables. The type of incentive provided, whether in-kind or in cash, correlated most strongly with performance; CHWs who receive a monetary incentive perform better than those who receive gifts in-

**Table 13: Multivariate analysis of factors that correlate with performance**

Independent Variables	Coefficient and Significance Relative to Performance	
Adjusted R Square	0.317	
	Standard Coefficient	Significance
Incentive Type (In-Kind or Cash)	0.372	0.000
Service Time	0.364	0.000
CHW AIM	0.189	0.011
Incentive amount	-0.357	0.000
Days of Initial Training	-0.012	0.865

<sup>8</sup> CHW AIM elements were eliminated from the multivariate analysis because they are components of the CHW AIM program functionality result and would cause co-linearity in the regression.

kind. The second variable that correlated significantly with performance was service delivery time. This variable relates to the length of time CHWs spend with individual clients. Not surprisingly, the more time CHWs spend with each client, the more tasks they cover and the better their performance score. CHW AIM also correlated with performance, but not as strongly as incentive type or service time. Finally, incentive amount had a significant, but negative, correlation with performance and days of initial training, when compared with other variables, showed no statistical significance related to performance.

### Cluster analysis

Two-step cluster analysis revealed two principal clusters, sub-populations, within the performance data set. Of 300 possible cases,<sup>9</sup> 278 cases were included in the analysis; twenty-two cases (7.3%) were excluded from the analysis because there was a missing value for one or more variable. Cluster 1 represents predominately low performers. It is composed of 161 cases (58%) of which 74 percent are low performers (<40% of tasks completed), 25 percent are moderate performers (40% to 69% of tasks completed) 1 percent are high performers (70% of tasks completed). Cluster 2 represents mainly moderate to high performers. It is composed of 117 cases (42%) of which 31 percent are low performers, 63 percent are moderate performers, and 6 percent are high performers. Table 14 shows the statistically significant defining characteristics of these clusters.

**Table 14: Cluster characteristics**

Cluster (N = 278)	N	N%	Mean Performance	Service Delivery Time (min.)	Months Worked	Days of Initial Training	Hours Worked	Engagement (BL)	Engagement (EL)	CHW AIM (BL)	CHW AIM (EL)
1	161	58%	29%	4.9	50	6	8	4.3	4.4	23 (1.5)	24 (1.6)
2	117	42%	47%	13.6	32	13	28	4.5	4.5	32 (2.1)	34 (2.3)

Cluster 1, the low performers, has lower service delivery time, fewer days of initial training, fewer hours worked, slightly lower engagement, and affiliation with “non-functional” programs (based on CHW AIM results). Interestingly, Cluster 1 has worked, on average, longer than Cluster 2 (a mean of 50 months as compared to 32). This result confirms the bivariate analysis that the amount of time worked does not correlate with performance. It also suggests that months worked may have a negative relationship with performance where CHWs with longer experience actually perform worse than CHWs with less experience. The reasons behind this result, whether it is due to proximity to initial training or other factors, require further study.

Cluster 2, the moderate and high performers, by comparison, has a service delivery time almost three times greater than that of Cluster 1, has had twice as many initial training days, works more than three times as many hours as CHWs in Cluster 1, has slightly higher engagement relative to Cluster 1 and, based on CHW AIM scores, is affiliated with more functional CHW programs. In short, the better performing group spends more time with clients, is better trained, works more hours, is slightly more engaged and is composed of members of more functional CHW programs.

### 5. Factors that correlate with more active engagement

Though there was no consistent correlation between total CHW AIM scores and engagement, three CHW AIM elements showed a positive correlation with CHW engagement (Table 15). Two elements, opportunities for advancement and individual performance evaluation had a moderately strong correlation with performance (0.334 and 0.357 respectively at baseline, and 0.319 and 0.228, respectively, at endline). The third variable, incentives, showed a weak correlation (0.003 and 0.399)

<sup>9</sup> Site 6, the control site, was excluded from this analysis because no CHW AIM data are available for that site.

with no statistically significant correlation for baseline engagement results, but a significant correlation for endline engagement.

It is important to note that the elements relate only to scores in the CHW AIM tool and not to data on amounts of incentives or types of opportunities for advancement. The analysis suggests an association among the elements and engagement, but not a predictive relationship. Thus if an organization has a stronger system, based on the CHW AIM criteria, for individual performance evaluation, opportunities for advancement and, to a lesser extent, incentives, it is more likely to have more engaged CHWs.

**Table 15: Factors that correlate with engagement**

CHW AIM	Engagement Baseline			Engagement Endline		
	N	Pearson Correlation Coefficient	Significance	N	Pearson Correlation Coefficient	Significance
Opportunities for advancement	152	0.334	0.001 ***	108	0.319	0.001 ***
Individual performance evaluation	152	0.357	0.000 ***	108	0.228	0.018 *
Incentives	152	0.167	0.033 NS	108	0.399	0.000 ***

NS=no significance; \*=0.05 level significance; \*\*=0.01 level significance; \*\*\*=0.001 level significance

## C. Cost Analysis

### 1. CHW AIM workshop costs

One-day CHW AIM workshops were fairly inexpensive. Table 16 presents the average costs for CHW AIM workshops per organization. HCI spent between \$356 and \$1136 per workshop with total average costs of \$371 to \$1064. Costs per participant ranged from \$16.91 to \$56.00. Differences in costs are attributed to whether the program was situated in an urban or rural environment and whether the process was conducted only for one district or for multiple districts (Site 5). Higher per participant costs at Site 5 related to costs associated with lodging participants who were coming from farther distances and could not arrive and return in a single day.

**Table 16: CHW AIM workshop costs**

Site	Site Type	Intervention Area	Total Cost for 2 Workshops	Average Cost per Workshop	Average Cost Per Participant
1	Rural	District	\$743	\$371	\$21.84
2	Rural	District	\$964	\$482	\$16.91
3	Urban	District	\$1239	\$620	\$19.06
4	Urban	District	\$1227	\$614	\$23.15
5	Urban-Rural	Multi-District	\$2128	\$1064	\$56.00

### 2. CHW program costs

This study sought to test out the cost effectiveness of the CHW AIM process. However, cost and program output data in terms of numbers of clients served by CHWs and in terms of outcomes, such as defaulter rates, were either unavailable or too weak or limited to support a cost effectiveness analysis. However, a rough assessment of costs invested in the programs relative to the numbers of clients served is possible. Table 17 presents costs of program investments in incentives, training, and supervision and number of clients served.

**Table 17: Program costs (USD)**

	Site 2*		Site 3		Site 4		Site 5	
	Total	Per participant	Total	Per participant	Total	Per participant	Total	Per participant
<b>Inputs</b>								
In-kind (per month)	77	1	0	0	0	0	0	0
Salary (per month)	0	0	812	7	1966	42	7554	154
Training (per month)	1625	27	1944	78	3216	132	2137	45
Supervision (per month)	123	8	33	2	107	36	671	
<b>Total</b>	<b>2789</b>	<b>93</b>	<b>4028</b>	<b>152</b>	<b>6516</b>	<b>263</b>	<b>12490</b>	<b>311</b>
<b>Clients Served</b>								
Total number of clients served per month	HBC	160						
	OVC	426						
	ANC						3183	
	PNC						1097	
	ART			1241		12767		
<b>Total</b>		<b>586</b>		<b>1241</b>		<b>12767</b>		<b>4280</b>
<b>Per client cost</b>		<b>\$3.11</b>		<b>\$2.25**</b>		<b>\$0.41**</b>		<b>\$2.42</b>

\*HCI was unable to obtain cost data from Site 1.

\*\* The site does not disaggregate clients seen by CHWs and those seen by clinic staff; actual per client cost relative to CHW inputs is likely to be greater. This calculation also assumes that all clients are seen by CHWs every month, which may not be the case.

Volunteer CHW models are not necessarily less costly, especially if organizations feel they cannot demand much of volunteers in terms of service delivery. Site 2's CHWs are purely volunteer; they receive gifts-in-kind when available. As Table 17 shows, Site 2's total input costs are the lowest, but their cost per client served is the highest—higher, in fact, than the three sites that provide monetary incentives. Site 2 had only achieved 71% of its OVC target for the period and 53% of its HBC target, so presumably if the organization were to achieve its targets its costs per client served would also decline. Site 5 has the highest input costs, but when compared with the number of clients being seen, its cost is lower than Site 2 and roughly in line with Site 3. Site 4's cost per client served is lowest. The organization does not disaggregate clients served by CHWs from those served by clinic staff, but CHWs staff ART clinics and provide a significant amount of ART adherence counseling at the clinics, as nurses do not have time to counsel clients. It is important to note, however, that the actual cost is likely higher and difficult to ascertain from the available data.

### 3. CHW incentives and workload

Incentives paid to CHWs among sample sites varied significantly and were, for the most part, not founded on work or workload. Only Sites 4 and 5 had established clear work standards in terms of time. Sites 1 and 2 set a maximum of numbers of clients to be served per CHW, but did not set time

expectations. Neither Site 3 nor site 6 had set any standard for hours of work or number of clients seen. In interviews, data collectors asked CHWs how many hours they typically work, on average, per week. Table 18 presents the total incentive pay relative to estimated total hours of worked per month.

**Table 18: Incentives paid to CHWs**

Site	Incentive Type	Monthly Incentive Value	Average Hours Worked per week	Estimated Monthly Hours	Pay per hours of work
1	In-Kind	ND	8	32	ND
2	In-Kind	\$1.30!	8	32	\$0.04
3	Cash	\$60	17	68	\$0.88
4	Cash	\$32	22	88	\$0.36
5	Cash	\$105	30!!	120	\$0.88
6	Cash	\$60	6	24	\$2.50

! Represents cash equivalent of value of in-kind gifts provided per CHW per month for the intervention period of the study.

!! Represents only the incentive and average time for CHWs and not the Senior CHWs included in the sample. Senior CHWs were paid \$210 per month and were expected to work 40 hours per week.

Overall, CHW incentives are not calibrated to work expectations. Although Site 5 appears to pay an incentive far above what is paid by the other sites, it is actually equivalent to that paid by Site 3 in terms of pay per hour worked and less than that paid by Site 6. Site 6 provided the same incentive as site 3, but the number of hours CHWs reported working were much lower than those of Site 3, making Site 6's cost per hour worked the highest.

## IV. DISCUSSION

### A. CHW AIM and Improvement

The results indicate that the CHW AIM process contributed to program functionality improvement, but that improvements were not linear or consistent. There are a number of factors that may account for the small gains in mean CHW AIM results and the slides backward in some components. To start, organizational change takes time and 12 months is a short timeframe for organizations that are already rushing to keep up with existing project demands. While the CHW AIM Operations Research sought to have three data points 18 months apart, this had to be scaled back to fit the available budget. Secondly, many participatory processes that rely on program staff scoring themselves often find that scores in the second review are lower than the first. This occurs as participants gain confidence in the process, get a handle of the standards, and take a tougher stand on measuring their own status against the standards [32]. It is also important to stress that capacity assessment, on which the CHW AIM tool is founded, is more of an art than a science. The tool is useful for assessing program functionality and monitoring change, but it is not exact because, although objective measures exist, there is always some degree of human subjectivity in applying them. In short, the availability of only two data points, the short time period, and the nature of organizational capacity assessment processes may all account for the results at hand. There is still a tremendous amount to learn from the process, the experience of the organizations in using the process, and the stories of change that emerge from the CHW AIM process.

The stories that led to the changes provide important insight into what organizations are able to do with the CHW AIM process and the factors that might facilitate greater improvement. Appendix 4 presents a summary of stories of specific changes made and their results for each element of the CHW AIM tool, and Appendix 5 provides summary action plans for each organization. Examples of these changes are provided in Table 19.

**Table 19: Examples of changes made by sites**

CHW Program Functionality Area	Changes Made by an Organization to Improve
Continuing Training	At Site 2, baseline CHW AIM workshop results revealed that CHWs had not had continuous training in more than 12 months. In the action plan, the organization set out to develop a training plan that would include standards for how often training should be done and guidelines for selecting training topics. They also made an action to provide refresher training to all CHWs. By the endline, the organization had a training plan in place. They had set a training standard of every six months. They had also made sure that every CHW had refresher training in the last 12 months and most had more than one refresher training. As a result of this change, the organization's score in continuous training improved from a 1 to a 2 between the baseline and endline. In addition, performance at this site increased significantly between the baseline and endline assessment, which may be due to this training.
Referral System	At baseline, Site 1 had no referral form for CHWs. A referral form had been in use more than a year prior, but it was lost and CHWs were no longer documenting referrals. The organization defined four actions: 1. Source the original referral form and adapt it if required; 2. Train zonal supervisors to complete the referral form; 3. Train CHW team leaders and CHWs to complete the referral form; and 4. Orient health facility staff to the referral form and to providing feedback. The organization successfully sourced the original referral form, trained supervisors and CHWs and oriented the clinic staff. They also got the agreement of the DHMT to use the form, though this was not originally in their action plan. At endline, CHWs were using the referral forms and felt comfortable completing them, feedback was still a challenge, but the organization was taking things one step at a time. Site 1's score for referral improved from a 1 to a 2.
Opportunity for Advancement	In one site, program managers argued that there was an informal system for advancement. Their trained CHWs were viewed as skilled and got opportunities with other organizations. A CHW argued forcefully that CHWs advancing to positions in other organizations had to do with their training and experience, but nothing to do with the organization actively creating opportunities for advancement for its CHWs. The group reviewed the criteria and talked about the need for the organization to have a structured system that would help CHWs to advance to other positions inside or outside of the organization (such as study leave), or an internal system that recognized good performers and might advance them to CHW leaders or peer supervisors. In the end, program managers listened to the CHWs and acknowledge that they had no system in place and that appropriate actions should be documented in the action plan so that a system could be established.

The changes that organizations made to strengthen their CHW programs spanned almost every element area. Some organizations were able to develop revised CHW agreements and job descriptions to strengthen CHW recruitment and roles. Several oriented health facility staff to the CHW role to decrease demands on CHWs to carry out services they are not trained to provide. Others created training policies that established minimum standards and frequencies for CHW training or created training databases to help track which CHWs have been trained in which areas and improve monitoring of CHW training needs.

Two organizations initiated new strategies to work more closely with community HIV/AIDS institutions such as provincial, district, zonal and community AIDS taskforces (PATFs, DATFs, ZATFs and CATFs). One organization introduced a referral form and trained CHWs to complete the form properly. Another initiated a paid study leave policy to encourage CHWs to go back to school. Three organizations improved their documentation and information management systems by providing CHWs with reporting formats and training them to use them. Finally, one organization began serious discussion with the Ministry of Health about the sustainability of its program and support for its CHWs. The

release of the Ministry of Health's National Community Health Worker Strategy also clarified the MOH's view of various types of CHWs and how they will relate to the system, though MOH ownership of what it calls "community health volunteers", under which most CHWs included in this study fall, is still evolving.

The program elements organizations are struggling with the most – referral systems, supervision, linkages to the health system, and individual performance evaluation – present serious challenges to program functionality. Most organizations are able to develop referral processes but obtaining feedback from facility staff on the referral remains a challenge. In addition, many organizations have been at a loss as to how to establish sustainable community-based emergency transportation for referral. In Zambia, many systems have been tried; recently, the government introduced the "zambulance,"<sup>10</sup> but functionality and sustainability are still obstacles in hard to reach and very poor communities.

Programs need to plan for and invest in adequate technical supervision from the start. Linkages to the health system also remained a challenge for many organizations. The Zambian Ministry of Health has done a lot to acknowledge the importance of CHWs and invites their participation in the health system, but it is still not equipped to supervise, equip, and incentivize the full range of community health workers operating in the country. In addition, where linkages with the health system are strong, high turnover of staff presents challenges to organizations that find they need to continually orient facility staff to the CHWs and their roles. Without strong supervision systems, individual performance evaluation is beyond the reach of most of the organizations that participated in this study.

Community mobilization for support of CHWs is an area that requires more technical support. Every organization faced challenges getting substantive community support for CHWs. While community leaders and members appreciate the services of CHWs, they were unwilling to invest in them and saw CHW support such as monitoring, feedback and incentives or assistance, as the responsibility of the NGO or government. More community sensitization is required to ensure headmen or other leaders do not expect CHWs to provide gifts to them and, instead, take responsibility for mobilizing support from the community to CHWs.

Program managers appreciate the CHW AIM process and recommend its continued use in their program and by other programs. Based on their experience, they recommended that experienced outside facilitators be available to support the process and several noted that additional funds might need to be provided. Support to carryout actions in-between CHW AIM assessments is also desirable. Organizations required additional tools and examples related to the different CHW AIM elements to help them come up with creative and successful approaches in their own contexts. Additional technical support could help CHW programs in this area.

## **B. Linkages between Program Functionality, CHW Engagement, and Performance**

### **1. Performance**

Across sites, CHW performance (task completion) in adherence support and positive living counseling was only moderate to low. Although not captured in the performance assessments, the data collectors analyzing the service delivery recordings also remarked that there were many cases where inappropriate or inaccurate information was also provided. Only two sites, Sites 4 and 5, had job aids that their CHWs used to guide service delivery. Both sites also provided supportive supervision and conducted service delivery observations. Site 4 had among the strongest performing CHWs; Site 5's performance was not as strong as would be expected given the structure of the program and its investments. When asked

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<sup>10</sup> A bike with cart attached for community members to use for emergency transport of critically sick residents to health facilities. In some places organizations say this is working, in other areas organizations are finding that community members are struggling with the terrain and are reluctant to use the bicycles.

about quality assessment or technical supervision, the other three sites had no systems in place. They had no job aids for their CHWs, conducted no service delivery observations and did not evaluate quality as part of their annual project performance evaluation processes.

Contact time with clients was surprisingly short. Almost 50% of the CHWs for which recordings were obtained spent five minutes or less with clients. Not surprisingly, performance for the service delivery sessions that were shorter was also poorer. For the four sites for which ART adherence monitoring support was assessed, average contact time ranged from 4.3 minutes at Site 1, where the average performance score for both baseline and endline assessments was only 22%, to 12.7 minutes at Site 4, where the average performance score at endline for matched results was 43%. The performance results indicate that expectations for exactly what tasks should be covered in a service delivery session and the time it should take to meet minimum standards needs to be identified by organizations and communicated to CHWs.

## **2. Engagement**

Most CHWs were engaged and, overall, CHWs are extremely proud of the work they do and gain tremendous satisfaction from helping their fellow community members. However, simply being a CHW is not enough to sustain engagement. There were statistically significant changes in engagement results between the baseline and endline at three sites, and these examples illustrate some of the factors that can negatively and positively influence engagement. Sites 3 and 6 showed statistically significant declines in engagement. Both sites experienced a complete funding cut from December 2010. When the engagement survey was conducted, CHWs had not received their incentives in 10 months. Although the engagement survey does not ask about satisfaction with pay or incentives, the link between incentives and engagement among these CHWs was clear and is backed by other studies that note the demotivating effect of inconsistent remuneration. [17][33] By contrast, Site 2 showed a statistically significant increase in engagement. At baseline, CHWs had been active without much supervision, support, or training for the previous 10 months. Between the baseline and the endline, a district coordinator was appointed, training was arranged and conducted for all CHWs, and they were reporting again.

CHW engagement interviews confirmed the findings of the CHW engagement survey, but also provided additional descriptive data to help interpret engagement survey results. While a majority of CHWs say they feel supported by the community, the main evidence they provide for this support is that community members call on them when people are sick and need assistance. Communities are not supporting CHWs by monitoring their work, providing feedback, or providing assistance or incentives to CHWs. Likewise, a majority of CHWs have been visited by a supervisor in the last three months, and most say the supervisor provides guidance on the CHW's work, but very few have been observed by a supervisor. Sites 1 and 2, which have no technical supervision, also had a higher percentage of CHWs respond that the supervisor "encourages" them. In sites with structured supervision systems, more CHWs report getting guidance and being observed by supervisors.

Few CHWs report receiving recognition, and those that do perceive certificates received mainly in training as recognition. Recognition can be an inexpensive and effective means for boosting CHW engagement and performance; organizations need support to develop effective recognition systems. Engagement interviews also confirmed findings of the engagement survey and the CHW AIM workshops that most CHWs had no opportunities for advancement. Only one organization had thought through a system for internal advancement; the idea was new to the other four intervention organizations.

## **3. Relationships between program functionality, engagement, and performance**

Programs with higher functionality scores are more likely to have better performing CHWs. This was borne out in bivariate, multivariate, and cluster analyses. However, CHW program functionality is not the strongest predictor of performance. The data indicate that CHWs who are paid a monetary incentive perform better than volunteer CHWs who receive only gifts in kind. Importantly, however,

the data also show that greater monetary incentives do not necessarily correlate with better performance, especially when compared with other factors that influence performance. The data from Site 2 also suggest that volunteer CHWs can perform comparatively well when provided adequate training. In that site, CHW performance for adherence support improved from 35% to 49% between the baseline and the endline; the major difference between these two periods was a significant investment in CHW training by the organization.

The cluster analysis complements the bivariate and multivariate analyses and provides informative descriptive data. It confirms the finding of these other analyses that the time CHWs spend providing services to individual clients and CHW AIM program functionality are stronger among better performing CHWs. It also reveals other useful descriptors of better performing CHWs. Two enlightening characteristics of the better performing cluster, Cluster 2, were that it has a greater number of initial training days and had worked, on average, for fewer months. A more structured and comprehensive initial training may prepare CHWs better to perform their tasks than a series of short modular trainings. Reasons for a decline in performance over time are not clear from the evidence at hand, but could be linked to any number of factors, including time since initial training, lack of supervision or support, or simply de-motivation or fatigue.

Site 4 and 5 each provide 14 days of initial training. The training includes technical information, but also sessions on the CHW's role, the objectives of the program, and on administrative, data management and reporting issues. Both training programs were linked to the government curriculum and approved by the Ministry of Health, but were drafted and presented by the organizations. Sites 1 and 2 linked entirely with the government technical training. The Zambian MOH has modular trainings on a variety of HIV/AIDS topics, including counseling and testing, home-based care, and adherence support, among others. Training modules are typically three to five days, and CHWs may attend multiple trainings spread over an extended time period. For example, they may attend a five-day training in June for HBC and then another six months later for counseling and testing. The training modules are presented by government trainers, cover the technical issues and some operational issues, but would typically not cover topics specific to an organization's program such as the CHW's role in the program, program objectives, or reporting requirements. Both organizations provide an orientation to these topics for their CHWs, but it is not part of their initial training package. Site 3 provides a five-day day training that is approved by the Ministry of Health and is presented by trainers that are trained by Ministry of Health. The training curriculum was unavailable at both baseline and endline, but program managers said it focused mainly on technical topics and did not cover in detail the CHW role in the program, program objectives, or recording and reporting responsibilities and methods.

The fact that Cluster 2, the better performing CHWs, also had fewer months of CHW work experience (32 months on average as compared 50 months) suggests that experience alone does not make CHWs perform better. It also underscores the need for some sort of performance assessment that addresses the quality of service delivery, something that most organizations were struggling to establish.

While bivariate analysis indicated a weak association among CHW program functionality (CHW AIM total scores) and engagement, the cluster analysis showed that CHWs who perform better, on average, are also slightly more engaged. Like the bivariate analysis, the difference is small, but it is consistent.

## **C. Costs**

### **1. CHW AIM**

Although many program managers noted that cost could be a barrier to doing the CHW AIM process, the actual workshop costs are quite reasonable. When told that the workshop ranged from roughly \$350 to \$1200, program managers agreed that these costs were not that significant. Still, organizations need to factor CHW AIM workshops into their project plans and budgets if they are to be conducted.

## **2. Cost analysis**

Cost information was surprisingly difficult to get from several organizations. The organizations were not unwilling to provide the information, but most do not track costs specific to their CHW programs, which are often part of larger programs. Supervision costs were particularly difficult to obtain. Most organizations had a general budget and general tracking for transportation and per diem for field visits, but they were not necessarily linked to CHW supervision, and it was difficult for several organizations to disaggregate the data. Others simply were not supporting supervision visits.

It is clear from the CHW AIM results that organizations (and donors) need to adequately invest in supervision and continuous training, but it is equally clear from the cost data that consideration should also be given to inputs relative to clients served. CHWs provide health services, and every client, whether served by a CHW or a trained health worker, has a right to a quality service. The costs of recruiting, training, supervising, and remunerating CHWs are significant, especially if organizations want to ensure adequate performance. In one organization that supports purely volunteer CHWs (no monetary incentive), when pressed about observing service delivery or doing individual performance assessment, a supervisor noted that it would be hard to ask CHWs to endure such processes since they were “only volunteering.” However, equipping CHWs to work, even on a voluntary basis, has costs, and if programs cannot make demands of their volunteers then one has to question the model. In addition, it would be easy to assume that volunteer CHW programs are less costly than those that provide incentives to their CHWs, but this also may be misleading. Comparisons of Site 2, which has volunteer CHWs and one of the lowest input totals, and Site 5, which has highly remunerated CHWs and among the highest input totals are telling. Even with the limited data obtained, the cost per client served is quite a bit lower at Site 5 than in Site 2 (\$2.42 vs. \$3.11).

## **3. Incentives and workload**

Likewise, the data suggest that little consideration is given to incentives relative to workload or time commitment. At the initiation of this study, a donor representative expressed concern over the wide range of incentive types and amounts provided to CHWs in Zambia. He pondered what the appropriate incentive for CHWs should be. A program manager noted concern over the high incentive paid by another program because it led the CHWs his organization supported to demand higher incentives. These questions and comments, however, all centered on the total amount of the incentive and not the amount of the incentive relative to the CHW’s time commitment or workload. The CHW cadre encompasses a wide range of services, competencies, and time investment. When incentives are considered for CHWs, it is imperative that program managers and policy makers consider not just pay for the cadre “CHW” but pay for the time commitment and skill-level demanded of the CHW.

## **D. Limitations and Constraints**

Several challenges were encountered during the implementation of this study, some of which affected the original study design. The study originally considered that CHW AIM program functionality scores should be assessed at least three times and that three organizations would receive additional technical support in between CHW AIM workshops. Data on engagement and performance were also to be collected three times. The study was conceived as an 18-month study with nine months between each CHW AIM workshop. Financial considerations led to a revision of the study design. In the end, two CHW AIM workshops were held 12 months apart, and only limited technical support – mainly through the provision of resource materials and a few technical meetings with specific organizations – were conducted. The reduction of the timeframe and the limitation of data collection to two times, rather than three, means there are less data to compare.

In addition to the shortened timeframe, the study faced three other important challenges. First, two organizations (Site 3 and Site 6) experienced total funding cuts starting in December 2010. As a result,

they were unable to continue their programs as intended. CHWs remained active, but only on a voluntary basis; no incentives were paid. Both organizations experienced a reduction in the number of CHWs active between baseline and endline as a result of their funding cuts (Table 2). It was hoped that use of Site 6 as a control site – where CHW AIM was not implemented but performance and engagement data were collected – would enable an analysis of whether organizations that use CHW AIM improve their performance and engagement more relative to those that do not use CHW AIM. However, the analysis was compromised when Site 6 lost funding, since this major change negatively influenced performance and engagement. The lack of client outcome data, such as reductions in defaulters, rendered cost-effectiveness analysis infeasible.

Without funding, Site 3 also had great difficulty carrying out its CHW AIM action plan; though it made some progress, ultimately this organization showed a performance decline. One organization, Site 4, experienced a reduction in funding. It reduced the number of CHWs it supported, but maintained financial support and management systems for those it retained.

Second, cost data proved extremely difficult to obtain. One organization was unable to provide any cost data on its CHW program, and a second failed to provide any cost data following the baseline data collection. Most organizations track costs for training and incentives, but many do not disaggregate the costs for CHWs and other program initiatives or staff, and costs for supervision are rarely tracked. It is thus difficult for organizations to retrieve information on costs specific to their CHW programs.

Third, programs tended to keep data on numbers of clients served, but not on how many visits or counseling sessions were provided to each client or on how much work each CHW was undertaking. In some cases clients served by CHWs and clients served by nurses or other cadres were recorded simply as clients served. This made it difficult to get reliable data from program statistics that could be easily tracked to CHW work.

## V. CONCLUSIONS AND RECOMMENDATIONS

Organizations felt the CHW AIM process was useful and helped them take stock of their program and develop constructive actions to address issues. While measures of improvement captured through this study are inconclusive, the stories of improvement that come out of this study suggest that the tool can catalyze improvement. There was a statistically significant correlation between CHW AIM scores and CHW performance, suggesting that organizations that have stronger CHW AIM scores are also likely to have better-performing CHWs. We found only a weak correlation between CHW AIM and engagement and no correlation between engagement and performance. However, several CHW AIM elements correlate strongly with higher levels of engagement. These include individual performance assessment, opportunities for advancement, and incentives. Organizations with stronger systems in these three areas are likely to have more engaged CHWs.

Performance varied greatly among organizations. However, overall performance was only moderate to low. The type of incentive provided, cash versus in-kind, showed the strongest correlation with performance. The time spent with clients also correlated strongly with performance, as did CHW program functionality (total CHW AIM scores), but not with a lower significance level. The data suggest that paying CHWs and providing them the information, skills and environment they require to spend the necessary time with each client will improve performance. It also indicates that organizations with stronger CHW AIM scores are more likely to have better-performing CHWs than those with lower CHW AIM scores.

Organizational investments in CHW programs varied greatly among sites that participated in the study. Organizations do not systematically track costs of supervision visits, and data on clients served by CHWs often do not accurately reflect the workload of CHWs, either because the total number of clients is tracked and not client visits per CHW or because an aggregate number of clients are tracked

who may be seen by CHWs or another provider. In addition, outcome indicators, such as reductions in defaulter rates, are frequently not tracked by organizations that support CHWs, so the cost-effectiveness of programs relative to the outcomes of their efforts cannot be calculated. The value of incentives paid per CHW also varied greatly, but these cannot be interpreted alone. The hours CHWs are expected to work and the number of clients served must be considered when analyzing incentive payments. The CHW AIM process is fairly inexpensive to implement and should be feasible for most organizations to fund if it is incorporated in project plans and budgets.

## A. CHW AIM Recommendations

Applying the CHW AIM process 10 times with five different organizations over a 12-month period provided a wealth of learning. The process is valuable and works well, but could be further strengthened. Program managers and other participants in the process had useful feedback and practical suggestions about how to make the process as effective as possible. The following are some of the key recommendations related specifically to CHW AIM that emerged from the operations research study. The recommendations are divided into two categories: 1) recommendations specific to the revision or improvement of the CHW AIM process, and 2) recommendations related to organizations and organizational needs.

### 1. Recommendations for revision and improvement of the CHW AIM process

- **Investment:** Effective CHW programs have costs. Donors and program planners need to invest and budget sufficient resources, including financial and human resources, to enable CHW programs to implement effective supervision, training, and monitoring, among other things.
- **Technical Assistance:** Organizations require technical assistance to develop effective strategies to address problems and to implement strategies. Donors supporting the CHW AIM process should consider financing technical support to organizations to strengthen improvement and improvement results.
- **Expectations:** Program improvement takes time. Organizations cannot address every issue at once. Many systems are difficult to change once program funding has been allocated. In addition, some organizations may not have the technical expertise to make effective changes and may require technical support.
- **Prioritization:** Organizations need some framework for prioritizing what they address. Facilitators assisted organizations to prioritize actions in their action plan by extending the timeline for lower priority activities. However, the tool might be strengthened by pre-defining priority elements or by providing guidance on how to prioritize actions.
- **Timing:** If used as an improvement tool, rather than an evaluative tool, the timing of the CHW AIM process is critical. It should be conducted prior to an organization's annual planning and budgeting process so that actions can be included in the annual workplan and budget.
- **Resources:** Organizations need more resources, such as practical tools and examples, for strengthening supervision systems, developing opportunities for advancement where financial resources are constrained, strengthening community involvement, and putting into practice individual performance appraisal. Resources such as the CHW AIM toolkit and the CHW Central website ([www.CHWcentral.org](http://www.CHWcentral.org)) are starting to address this issue, but more will be needed.
- **Facilitation:** Facilitation aids the CHW AIM process. Experienced facilitators with knowledge of CHW programs can challenge workshop participants on scores and provide useful examples for how organizations can address problems.

## 2. Recommendations for organizations implementing CHW AIM

- **Leadership:** Involvement of decision-makers and headquarters staff greatly strengthens the effectiveness of the process. Many changes cannot happen at a local level and must be directed from a headquarters office and applied across a program. Headquarters staff were urged to participate in the CHW AIM process, but conflicting obligations sometimes made this difficult. Local staff had difficulty moving action plans forward without the active involvement of senior technical advisors and management.
- **Community Challenges:** Even those organizations with the strongest community ties had trouble galvanizing community action and fostering a sense of responsibility among community members for CHW support. In very poor communities, organizations argued, the community sees the CHWs as *having* resources – either because they get an allowance, or they attend training, or simply because they have a special role. Convincing communities to invest time or resources to support CHWs is challenging. More examples are needed of how organizations work effectively with communities and particularly, examples that provide practical details from the start of a process, how to sustain community involvement, and how to troubleshoot problems with community support of CHWs.
- **Country Ownership:** Country ownership is critical to the long-term sustainability of CHW programs. Several organizations were concerned about how their CHWs would continue to be supported when the program funding eventually ended. While some organizations argued that they had little control over whether the Ministry of Health took ownership of CHWs or not, two organizations deliberately initiated conversations with the government, and these conversations led to stronger country ownership scores. Organizations should make advocating for increased support from and stronger linkages to the Ministry of Health, part of their strategies from design through implementation.

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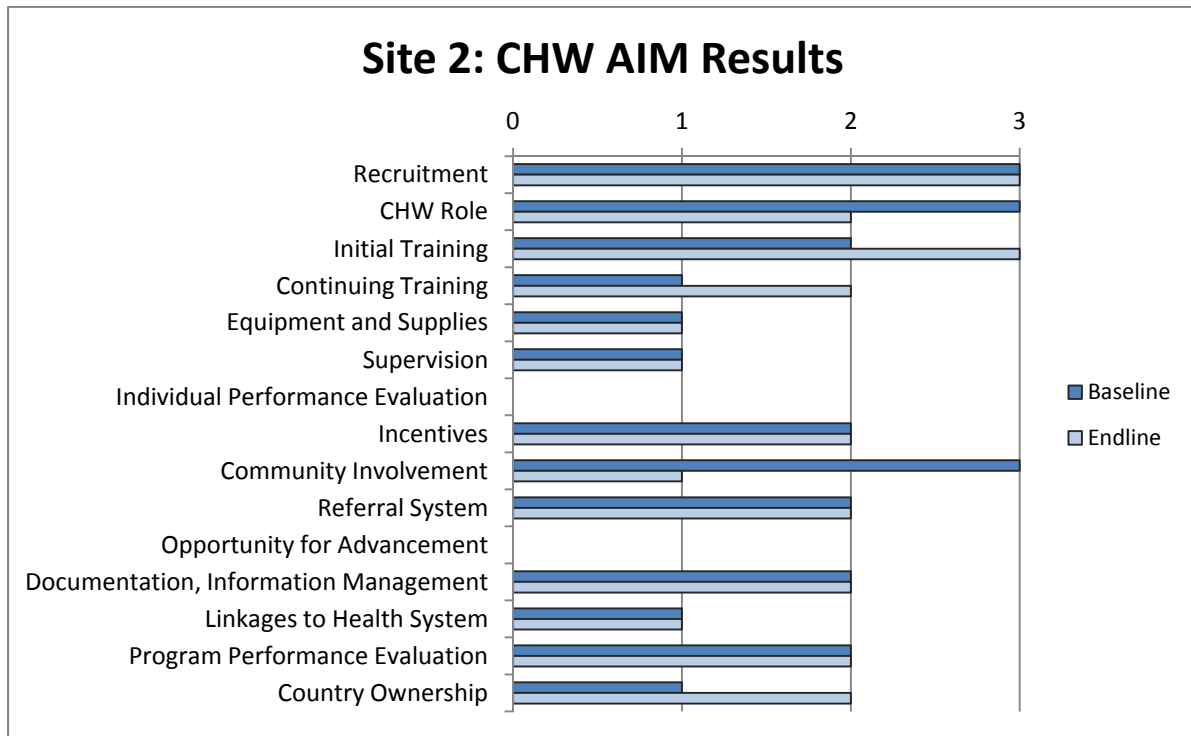
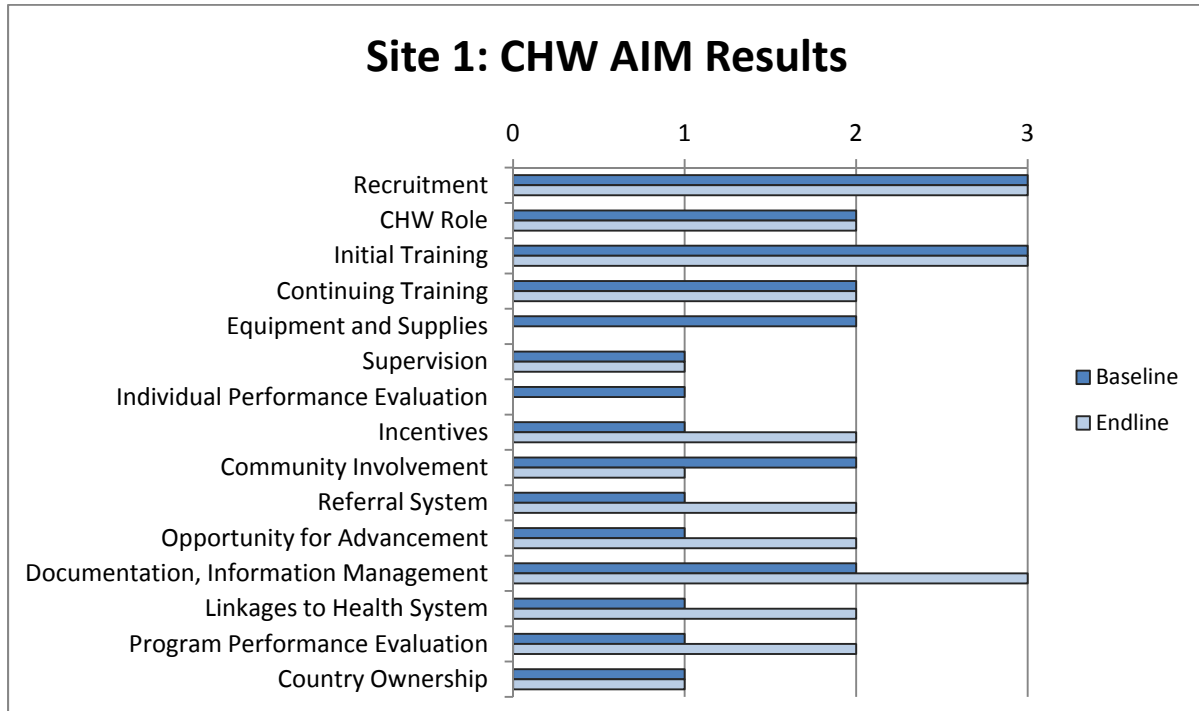
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## VII. APPENDICES

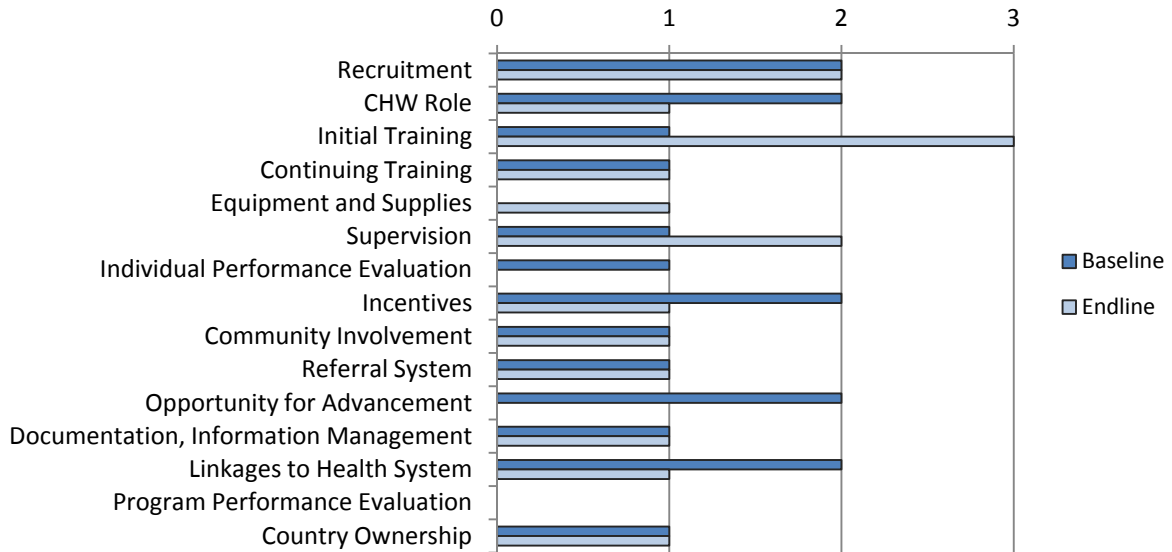
### Appendix 1: CHW AIM Workshop Agenda

Time	Activity
9:00 to 9:30	Welcome and Introductions
9:30 to 10:00	Review of the CHW AIM Tool and Approach
10:00 to 10:45	Group Work, scoring
10:45 to 11:00	Tea Break
11:00 to 1:00	Group Work, Scoring
1:00 to 2:00	Lunch Break
2:00 to 3:30	Presentations and discussions of scores, consensus agreement
3:30 to 4:00	Review and agreement of CHW AIM HIV AIDS Intervention Matrix
4:00 to 4:15	Tea Break
4:15 to 5:15	Plenary review of action plan and discussion of next steps

## Appendix 2: Site-by-Site CHW AIM Results



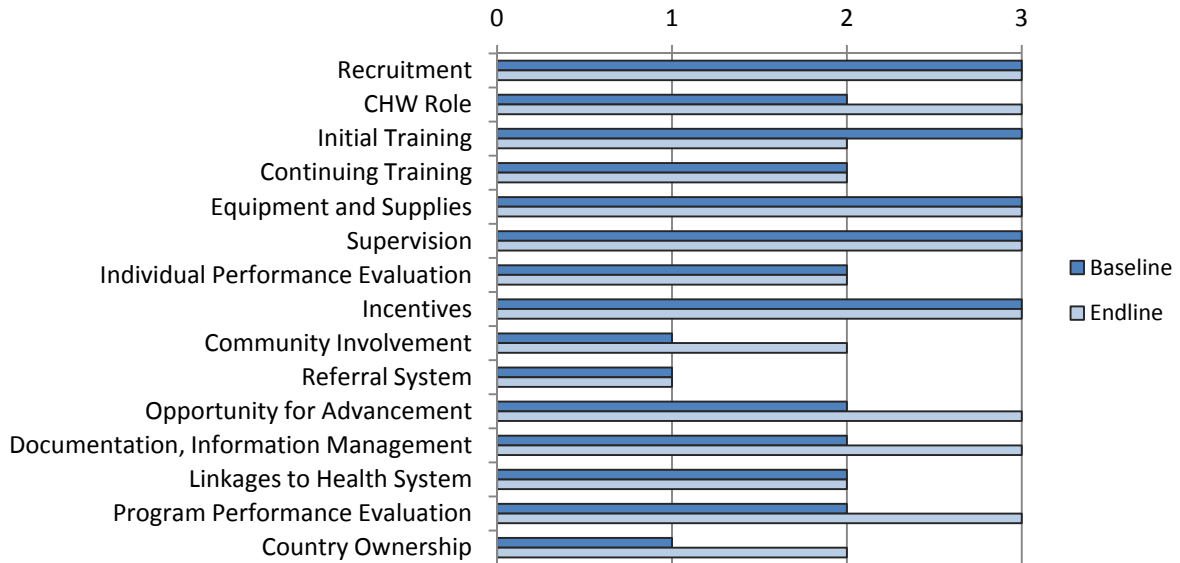
### Site 3: CHW AIM Results



### Site 4: CHW AIM Results



## Site 5: CHW AIM Results



### Appendix 3: Correlation Analysis all Variables

Factor	Positive Correlation					Inconsistent, Weak or No Correlation					Negative Correlation			
	Variable	Assessment	N	PC	Significance	Assessment	Variable	N	PC	Significance	Variable	N	PC	Significance
CHW AIM scores and CHW AIM Element scores	CHW program functionality	BL	164	0.443	0.000	BL	CHW role	163	-0.122	0.121				
		EL	138	0.237	0.005	EL		137	0.074	0.393				
	Continuous Training	BL	163	0.161	0.040	BL	CHW recruitment	163	0.087	0.270				
		EL	137	0.442	0.000	EL		137	0.179	0.360				
	Equipment and Supplies	BL	163	0.35	0.000	BL	Supervision	163	0.391	0.000				
		EL	137	0.470	0.000	EL		137	0.164	0.055				
	Country Ownership	BL	163	0.465	0.000	BL	Community Involvement	163	-0.356	0.000				
		EL	137	0.566	0.000	EL		137	0.371	0.000				
						BL	Incentives	163	0.334	0.000				
						EL		137	0.393	0.074				
						BL	Linkages with the health System	163	0.507	0.000				
						EL		137	-0.063	0.456				
						BL	Individual Performance Evaluation	163	0.138	0.079				
						EL		137	0.228	0.007				
						BL	Referral	163	0.364	0.000				
						EL		137	0.150	0.080				
						BL	Opportunities for advancement	163	0.291	0.083				
						EL		137	-0.251	0.003				
						BL	Documentation and information management	163	0.407	0.000				
						EL		137	-0.293	0.001				
					BL	Program Performance Evaluation	163	0.351	0.000					
					EL		137	0.122	0.156					
					BL	Initial training	163	0.150	0.055					
					EL		137	0.040	0.664					

Factor	Positive Correlation					Inconsistent, Weak or No Correlation					Negative Correlation			
	Variable	Assessment	N	PC	Significance	Assessment	Variable	N	PC	Significance	Variable	N	PC	Significance
Other Variables	Service delivery time		300	0.471	0.000		Hours worked	345	0.164	0.002	Number of trainings	333	-0.117	0.032
	Days of Initial Training		345	0.248	0.000		Engagement BL	163	-0.020	0.797	Months worked as a CHW	345	-0.165	0.002
	Incentive Type		300	0.363	0.000		Engagement EL	135	0.269	0.002				
	Incentive Amount		300	0.148	0.010		Total Training Days	337	-0.008	0.887				

## Appendix 4: Stories of Change and Improvement

CHW AIM Elements	Stories of Improvement
<p><b>1 Recruitment</b> How and from where a community health worker (CHW) is identified, selected and assigned to a community, including selection criteria</p>	<p>Site 3 had trouble with keeping CHWs just after training. They would invest time, effort and money training CHWs only to have them leave a few weeks or even days after the training. While writing the baseline CHW AIM action plan, the organization decided to develop a written agreement that would list the CHW role and conditions of engagement. CHWs would be asked to sign the agreement before training was provided. The organization developed the agreement and feels it will help improve future recruitment and retention. The organization maintained its recruitment score at 2 from baseline to endline but feels a foundation is now in place to move to a 3 in subsequent assessments.</p>
<p><b>2 CHW Role</b> Alignment, design and clarity of role from community, CHW and health system perspectives. A role is a general description of how the “job” contributes to the organization; expectations define actions and behaviors necessary for the CHW to be successful; tasks are measurable activities that the CHW performance when providing services.</p>	<p>Site 5 had very clearly defined and written CHW job descriptions and had set explicit workload expectations. CHWs were trained on their role, but clinic staff still sometimes asked CHWs to do things they were not trained to do, such as take blood pressure. During the baseline, the organization set an action to re-orient clinic staff to the CHWs role. They also recognized that their CHWs were working in resource constrained settings and that they would probably continue to be asked to help out with things technically outside their principal role. The organization developed a list of tasks that CHWs might be asked to do, based on experience, and ranked them as “green light tasks,” “yellow light tasks” and “red light tasks.” Green light tasks were those that required little skill and minimal client involvement so were low-risk, such as filing records; CHW were permitted to do green light tasks if asked. Yellow light tasks were those requiring moderate skill and client involvement; CHWs were discouraged from doing yellow light tasks, but could do them in special circumstances if they had appropriate skills or experience and if supervised by clinic staff. Red light tasks were those requiring significant skill and client involvement, such as assisting deliveries. CHWs were prohibited from doing red light tasks. Supervisors reported that clinic staff and CHWs had a better understanding of their role and of boundaries related to their role as a result of the change. Site 5 maintained its CHW role score at 3 for baseline and endline.</p>
<p><b>3 Initial Training</b> Training provided to CHW to prepare for role in service delivery and ensure he/she has the necessary skills to provide safe and effective care.</p>	<p>Initial training was generally strong in most organizations, but Sites 1 and 2 offered training on specific topics through government training programs and did not have a comprehensive initial training. Both sites had trouble tracking which CHWs had been trained in which topics. Site 1 set an action to develop a training database that would enable it to track which CHWs had training and on which topics. By the endline, Site 1 had developed an MS Excel database and the program manager had entered a good deal of data, but the database was not yet up-to-date. The program manager was excited though to have a tool that would enable her to more appropriately select CHWs for training and to help her identify training gaps. Site 1 was able to keep its initial training score at 3 and still improve its systems.</p>
<p><b>4 Continuous Training</b> Training to update CHW on new skills, reinforce initial training,</p>	<p>In Site 2, baseline CHW AIM workshop results revealed that CHWs had not had continuous training in more than 12 months. In the action plan the organization set out to develop a training plan that would include standards for how often training should be done and guidelines for how training topics should be chosen. They also put an action to provide refresher training to all</p>

CHW AIM Elements	Stories of Improvement
and ensure he/she is practicing skills learned.	CHWs. By the endline, the organization had a training plan in place. They had set a training standard of every 6 months. They had also made sure that every CHW had refresher training in the last 12 months and most had more than one refresher training. As a result of this change, the organization's score in continuous training improved from a 1 to a 2 between the baseline and endline. In addition, performance at this site increased significantly between the baseline and endline assessment, which may be due to this training.
<b>5 Equipment and Supplies</b> (including job aids) Requisite equipment and supplies are available when needed to deliver the expected services.	Equipment and supplies was a challenge for most organizations. Few made improvements in this element. Site 3's score in this element improved from a 0 to a 1, but only because they provided a recording format and books to their CHW leaders and created a system for them to ensure they always had a notebook. The system was still quite weak, however. Many organizations seem to find solutions to addressing equipment and supply issues particularly challenging because they require a good deal of logistics and are subject to financial constraints that many managers are not equipped to handle.
<b>6 Supervision</b> Consistent support for coaching, problem solving, skill development and data review.	Like equipment and supplies, many sites struggled to implement actions related to supervision. Timing of the CHW AIM was a constraint as improving supervision often required additional field visits, tools or even staff that the organizations had not put in their annual plans. Also many organizational staff seemed to practice supervision as a monitoring and evaluation exercise, focusing on the collection of data or reports. Technical supervision and quality improvement through supportive supervision were not widely understood.
<b>7 Individual Performance Evaluation</b> Evaluation to fairly assess work during a set period of time.	As previously noted, individual performance evaluation was a serious challenge for almost all organizations. Every organization had some sort of record review and group performance discussion, but structured individual performance evaluation was only available in Site 5. Sites with weak supervision systems were ill equipped to put in place individual performance evaluation systems and this element was determined beyond the scope of most programs until supervision and other critical systems are strengthened.
<b>8 Incentives</b> Financial (salary, bonuses, transportation, money for meals, income from sale of products). Non-financial (training, certification, advancement opportunities, formal recognition, uniforms, medicines, bicycles). Community incentives (food, labor, recognition).	No organizations improved their scores on incentives. Site 3 lost its funding and stopped paying incentives to CHWs. Not surprisingly, its incentives score went down.
<b>9 Community Involvement</b> Role that community plays in supporting	Site 4 was weak on community involvement. Its CHWs worked mainly out of clinics but also did community outreach at least 30 percent of the time. During baseline action planning, the organization decided to work with DHMT to help strengthen community committees. This was only partially

CHW AIM Elements	Stories of Improvement
(supervising, offering incentives, providing feedback) CHW.	done and the organization had little control over the DHMT, so managers took a different approach to improve community involvement. They made sure that managers, supervisors and CHWs sat on all community HIV/AIDS committees. At the endline, the provincial director was a leading member of the Provincial AIDS Taskforce, district program managers were members of District AIDS Taskforces and several CHWs were sitting on each of the Community AIDS Taskforces in the area. This participation in the community HIV/AIDS structure enabled the organization to coordinate better with other organizations working in HIV/AIDS, but also create awareness about its program and build relationships with stakeholders. The organization's community involvement score improved from a 1 to 2.
<b>10 Referral System</b> The process for: determining when referral is needed logistics planning for transport/payment to a health care facility when required; how referral is tracked and documented.	At baseline, Site 1 had no referral form for CHWs. A referral form had been in use more than a year prior, but it was lost and CHWs were no longer using any form. CHWs had been trained on when to refer clients, but neither CHWs nor the organization had any way to record or track referrals. The organization defined four actions: 1. Source the original referral form and adapt it if required; 2. Train zonal supervisors to complete the referral form; 3. Train CHW team leaders and CHWs to complete the referral form; and 4. Orient health facility staff to the referral form and to providing feedback. The organization successfully sourced the original referral form, trained supervisors and CHWs and oriented the clinic staff. They also got the agreement of the DHMT to use the form, though this was not originally in their action plan. At endline, CHWs were using the referral forms and felt comfortable completing them, but feedback from clinics was still difficult to track and the organization was not routinely tracking referrals. Site 1's score for referral improved from a 1 at baseline to a 2 at the endline.
<b>11 Opportunity for Advancement</b> The possibility for growth and advancement for CHWs, including certification, increased responsibilities, path to formal sector or change in role.	Site 5 had a strong system for opportunities for advancement. They had a CHW and a CHW supervisor position that was equivalent to a senior CHW, but with some added qualifications. When CHW supervisor positions opened up, the organization always advertised them first among the CHWs and allowed any qualified CHWs to apply. Only if they couldn't fill the position with their existing CHWs would they look outside. The organization was very committed to advancing its CHWs, between the baseline and endline, it created a study leave policy that encouraged CHWs to go back to school. The organization would provide up to 32 days of paid leave for CHWs to attend school. As a result of this change, the organization's score in opportunities for advancement changed from a 2 to a 3 from baseline to endline.
<b>12 Documentation and Information Management</b> How CHWs document visits, how data flows to the health system and back to the community, and how it is used for service improvement	Site 5 also had a fairly solid record keeping system, but it did not share program data or results with the health center staff or the communities where CHWs worked. To address this issue, the organization put an action in place to regularly share program data and results with facility staff and community representatives at health center meetings in which the community committee was present. The organization also oriented its CHWs to quality data keeping and to interpreting results of their own data so they could see how they were doing vis-à-vis their targets and objectives. Managers and supervisors said that by sharing data with the facilities they had generated a lot more support from facility staff and community members.

CHW AIM Elements	Stories of Improvement
	<p>Their data were now regularly integrated into facility reports, CHWs were more respected by clinic nurses and the community had a greater awareness of the program. As a result of this change the element score in documentation and information management changed from a 2 to a 3 from baseline to endline.</p>
<p><b>13 Linkages to the Health System</b> How the CHWs and communities are linked to the larger health system. Health system is made up of government, regions, districts, municipalities and individual health facilities that provide resources, finances, and management to deliver health services to the population.</p>	<p>By improving its referral system, strengthening facility participation in training and carrying out its action to introduce all CHWs to the facility staff, Site 1 managed to improve its linkages score from 1 to 2 between the baseline and the endline.</p>
<p><b>14 Program Performance Evaluation</b> General program evaluation of performance against targets, overall program objectives, and indicators carried out on a regular basis.</p>	<p>Site 1 improved its program performance evaluation score from a 1 to a 2 between the baseline and endline assessments. In its action plan, it had defined who actions: 1. Develop a system for collecting data on service delivery quality provided by CHWs and incorporate it into the annual performance evaluations and 2. To use existing review meeting structures to provide information on program results to CHWs and community members. The organization was unable to realize the first action, largely because it was unable to create a technical supervision system, but it did start sharing results with CHWs and CHWs noted how much they appreciated learning how the program was doing and how they were contributing to results. Sharing of information with community members still had not been fully implemented, but the organization was working on developing a mechanism.</p>
<p><b>15 Country Ownership</b> The extent to which the ministry of health has: integrated the CHW cadre in health system planning (e.g. policies in place); budgeted for local/district/national financial support; and provided logistical support (e.g., supervision, supplies) to sustain CHW programs at the district, regional and/or national levels.</p>	<p>Site 1 has a large number of CHWs. Headquarters staff attended the baseline and endline CHW AIM workshops. They had seen their program wane in between funding cycles and were concerned about sustainability issues. In the discussion of country ownership, the organization made an action to advocate with MOH to recognize and take responsibility for their CHWs. After the baseline assessment the organization realized they had to start working on getting MOH support for the CHWs as soon as possible. From the start of the new funding cycle, the organization began involving MOH in its planning meetings and discussions about key technical issues related to CHWs. Senior Managers have started discussions with MOH to come up with a plan to transition the CHWs over to the government. A lot of negotiation is still needed, but the organization has made an important start. For this organization, country ownership remained steady at a 1 from baseline to endline, but important steps have been taken that will hopefully move the organization to a 2 in the future.</p>

## Appendix 5: Summary CHW AIM Action Plans by Organization

### Site I: Actions and Interventions

CHW AIM Element	Issue	Action	Done ✓/✗	Result
Continuing training	Training tracking system does not track which CHWS have what training and when.	Conduct a training needs assessment to document who, among existing CHWs, has been trained in what	✗	In progress
		Develop a training tracking system that enables identification of which CHWs need which training.	✓	Database developed, but not all data entered yet
Supervision	No supervision checklist to use with CHWs.	Develop a checklist for supportive supervision (including supervision of service delivery)	✗	Not done
	Zone supervisors not trained in supportive supervision.	Conduct training for supervisors	✗	Not done
	Zone supervisors do not have training in technical areas they need to supervise.	Train supervisors in the technical areas they will need to supervise (HBC, OVC, etc.)	✗	Some have had some training, but not systematic
Referral System	CHWs do not have a standard referral form for referring to health facilities.	Source the original referral form and see if it can be reinstated or if it requires revision.	✓	Done, form in use
		Train CHWs in completing the referral form (may be integrated into M and E training)	✓	Done
		Train team leaders and CHWs in completing the referral form (in monthly meetings) and provide form	✓	Done, form in use
		Orient health facility staff to the referral form and to providing feedback.	✓/✗	Done, but feedback still rarely received
Documentation, information management	Record keeping is weak; CHWs do not have a template for recording data in their	Identify what CHW record keeping formats already exist at HQ or in other districts.	✓	Standard record formats made available

CHW AIM Element	Issue	Action	Done ✓/✗	Result
	record books.	Train all CHWs to use the record keeping format (look into training in blocks and integrating with referral form training).	✓	CHWs trained to use standard formats
Program Performance Evaluation	Data are collected, but not on quality of service delivery and results and achievements are not shared with CHWs or the community.	Develop a system for collecting data on service delivery quality provided by CHWs and incorporate into annual performance evaluations.	✗	Quality still lacking from performance evaluation
		Use existing review meeting structures to provide information on program results and achievements so that CHWs and community are aware of how their work is contributing to the overall program and its goals.	✓	Results shared with CHWs during monthly meetings but still not provided to community
Linkages to health system	Not all health facility staff are aware of or supportive of CHWs	Supervisors to coordinate introduction meetings between CHWs and health facilities following training.	✓	Done
		Identify a facility staff person to be a contact point for CHWs.	✓	Done
		Invite HC staff to participate in training opening or closing so they are introduced to or reminded about the CHWs	✓	Done, but facility staff not always available
Country Ownership	MOH has a policy on CHWs and a CHW training curriculum. Organization CHWs considered community volunteers. But MOH does not take responsibility for broad variety of CHWs addressing health issues	At district level, strengthen coordination with DHMT for recognition of org's CHWs and linking to other CHWs and health facilities.	✓	Meeting held and DHMT on board
		Advocate for MOH to recognize the broader range of community workers addressing health issues.	✓	Organization actively inviting MOH to participate in its strategy meetings

## Site 2: Actions and Interventions

CHW AIM Element	Issue	Action	Done ✓/✗	Result
Initial Training	CHWs are trained, but initial training does not include technical issues and training is uneven, some HBC, some VCT, some ART etc.	Complete training gap analysis	✓	Done
		Review and coordinate DHMT training for CHWs	✓	Done
		Provide full package of training to all CHWs	✓/✗	CHWs have been trained, but not all in all topics; Ministry program not always available
Continuing training	Continuing training is irregular	Develop a plan for regular refresher training (including standards for how often and guidelines for how training topics are chosen)	✓/✗	Done; 6 month trainings set as standard, MOH but trainings not always available
	CHWs have been idle for one year and require refresher training before start of new program	Provide refresher training to all CHWs	✓	Done: CHWs trained
Equipment and Supplies	There is a system for ordering supplies (home-based care kits), but procurement is irregular.	Get order and supply details from headquarters so can establish a regular supply system.	✓	Done
		Have meeting with DHMT to link to DHMT for some supplies	✓/✗	Done, but supplies not available at DHMT
		Make order request of essential supplies (kits) to ensure CHWs have what they need to provide services	✓/✗	Requests done, but supplies still not available.
Supervision	Supervision exists, but is mainly based on record management and moral support. System for technical supervision needed	Integrate technical component into the supervision process.	✗	Supervision still lacks a technical component; no technical supervisor available; current supervision based on record review.
	CHW group leaders and Coordinator not trained in supportive supervision	Train zonal leaders and coordinator in supportive supervision	✗	Not done

CHW AIM Element	Issue	Action	Done ✓/✗	Result
	No supervision tools in place to guide and standardize supportive supervision	Develop a supervision checklist	✗	Not done
Incentives	No incentives provided by the community to CHWs advancement	Hold community discussions to see if communities can also contribute to CHWs	✗	Some discussions, but no conclusion
Referral System	Lack of logistic plan for emergency referrals	Develop a logistics plan for emergency referrals	✗	Still a challenge; Zambulance available, but not always in use.
Opportunity For Advancement	No opportunities for advancement	Develop a strategy and system for classifying different CHW positions or opportunities for advancement in the CHW structure	✗	Not done
Documentation, information management	Data is collected and analyzed, but is not shared with the community Community does not use data from the program to solve problems at the community level	Hold community meetings to disseminate program results back to community	✗	Not done
		Hold community meetings to help community leaders/members come up with solutions to problems highlighted in program results	✗	Not done

### Site 3: Actions and Interventions

CHW AIM Element	Issue	Action	Done ✓/✗	Result
Recruitment	Churches are involved in recruitment but not the wider community	Develop strategy for involving the CATF in the CHW recruitment process to increase community involvement	✓	Done
	Some CHWs quit just after training	Develop a written agreement to ensure recruited CHWs commit before training	✓	Done, but not yet used
		Orient new CHWs to roles, responsibilities and expectations prior to training and as part of agreement signing	✗	Not done
CHW Role	Some CHWs encounter difficulties providing services to clients who are not of the same gender	Develop a system for identifying male and female CHW needs based on numbers of male and female clients	✗	Not done, but teams created so that CHWs can call on each other to help
	CHWs do not have a written job/task description	Develop a written job/task description for CHW (could be part of agreement – see above)	✓/✗	Done, but completed only at time of second CHW AIM workshop; not in use yet.
	CHW role is not reviewed Initial training does not include a practicum	Develop a process for reviewing CHW role annually	✗	Not done
Continuing training	Organization not clear on whether targets and training resources are for newly trained CHW only or if they can be used for refresher training.	Follow up with Senior Partner on resources and documentation for refresher training	✓/✗	Done, but no clear response from Senior Partner
		No refresher training provided	Develop a refresher training plan (how often, curriculum and resources)	✗
		Provide refresher training to CHWs who have been active for a year or more	✗	Not done

CHW AIM Element	Issue	Action	Done ✓/X	Result
Equipment and Supplies	CHWs do not have job aids to help with adherence counseling	Source a job aid from another local institution and adapt, as required	X	Not done
	CHWs want supplies for helping them get around in the rainy season	Look into possibilities for sourcing raincoats, umbrellas or gumboots (round 10 funds, private funds).	X	Not done
Supervision	Supervisory roles of Sister in Charge and team leaders are not clear	Define supervisory roles and responsibilities of SIC and Team leaders	✓	New supervisor recruited with job description and team leader job description developed
Community Involvement	Community institutions such as neighborhood health committees (NHCs) and community AIDS taskforces are not actively engaged and supportive of the CHW role	Hold meeting with CATFs, NHCs and ZATFs on ART supporter's role and community involvement in providing incentives.	✓	Done and participation of community in second CHW AIM workshop remarkable
Documentation, information management	CHWs do not have a record keeping format or record books, but record on paper without format	Develop a record keeping format for CHWs to use in the field.	✓	Done
		Orient CHWs to record keeping and coordinators to reporting (see below)	✓	Done
		Provide record books to CHWs to record their field activities using the standard format.	X	Not yet done, still recording on slips of paper
	Coordinators do not have a reporting format	Develop a standard reporting format from Coordinators to the hospital	✓	Done
Program Performance Evaluation	No regular program performance evaluation related to CHW activities	Develop a strategy for individual performance to implement after June 2011	X	No funding and no program performance evaluation conducted
Linking to community and social services for HIV/AIDS	CHWs don't know which other organizations are providing social services and other health services.	Obtain community service maps from ZATF/CATF and provide to CHW so they can link clients to other services	✓/X	Not done prior to second CHW AIM, but CATFs and ZATFs agreed to provide during second CHW AIM

#### Site 4: Actions and Interventions

CHW AIM Element	Issue	Action	Done ✓/✗	Result
CHW Role	Occasional demands for CHWs which they are not trained to do such as take blood pressure (BP)	Orient facility staff to the limits of CHW assistance: No BP or temperature, but other tasks like weighing and pulling files are acceptable	✓	Done; problem not entirely addressed due to difficulty of context, but mostly addressed
Continuing training	Health facilities do not keep records on CHWs training, when trained and what for.	Make sure the DHMT training tracking system is implemented at every health facility	✓/✗	Not done.
	CHWs face difficulties in counseling children and couples	Integrate child and couple counseling into the CHW initial and continuing training curriculum	✓	Integrated into refresher training
	CHWs need training in Male Circumcisions to meet the new guidelines for the country	Train CHWs in male circumcision using the existing training curriculum	✗	Not done, program has not formally taken on this issue as yet
Supervision	Adherence supervisors currently do not have a supervision checklist to guide supervision.	Develop a checklist for Adherence supervisors	✓/✗	Existing counseling form is being used as a checklist
Individual Performance Evaluation	Individual performance assessment currently does not take place in a systematic manner	To develop plan for individual performance assessment as assessment form.	✗	Individual performance assessment has not been addressed
Incentives	Need to reward/recognize deserving CHWs	Educate the community on the need to reward CHWs	✗	Not yet done
	CHWs who perform well currently are not regularly and publically recognized – missing an opportunity to motivate strong performance Transport reimbursement payments are delayed	Set up a system for recognizing the CHW of the quarter for each health center and post them in the ART clinic where staff and clients can see.	✗	Not done
		Implement the system for direct payments through Zain and the banks to ensure prompt payments.	✓	Payment issues resolved.

CHW AIM Element	Issue	Action	Done ✓/✗	Result
Community Involvement	Some involvement of community through health center committees (HCC), but neighborhood health committee and HCC community members are not as active as they need to be	Hold quarterly sensitization meetings with church leaders and business leaders to educate them about HCC and recruit more active members	✓/✗	The project addressed this in a different way. Project managers are members of the PATF and DATF. Some CHWs are now sitting on HCCs and there is a community focal person for health who meets with the CHWs. The system works better in some localities than in others.
		Revise the PLA to include more about HCC role and how to operate role and expectation of community partners	✓/✗	
		Use existing HCC meeting forums to strengthen HCC community members using the revised PLA	✓/✗	
Referral System	Some CHWs forget what the referral codes mean, particularly when they are out on field visits	Photocopy the referral register code page for CHWs to help them remember referral codes, particularly when on field visit.	✓	Done, CHWs oriented
	Referrals are strong, but could be reinforced, especially for new CHWs	Health center staff to conduct referral system reviews during the ART team quarterly meetings	✓	Done. Some referral issues persist: feedback not received sometimes, transport still a problem.
Opportunity For Advancement	There are not enough opportunities for CHWs to advance	Develop a strategy for creating an CHW leader position with roles and responsibilities, expectations (peer supervision, ensuring supply of forms etc.), and how they will be selected (should have a performance component)	✗	No addressed, actions carried over in the endline action plan.
		Circulate the strategy for comment and feedback by clinic nurses, CHWs and NGO staff	✗	Not addressed
		Post advertisements for psychosocial counselor trainings or other possible MOH advancement opportunities in ART clinics	✗	Not addressed

CHW AIM Element	Issue	Action	Done ✓/X	Result
Documentation, information management	CHWs do not have a framework for keeping records on community outreach (currently use blank notebooks)	Develop a framework for CHW community outreach record keeping using the existing forms (but transferring it into notebooks).	✓	Done, but CHWs requested further orientation on completing the forms during endline CHW AIM.
		Field test the framework	✓	Done and printed in a training book.
Program Performance Evaluation	Assessment is mostly quantitative and does not include assessment of service delivery quality	Integrate a service delivery quality assessment (sample) into the annual performance assessment perhaps using existing supervision forms	X	Not done; actions carried over to endline action plan
		Develop a strategy for soliciting community feedback on CHW service delivery into annual performance review (community satisfaction)	X	Not done; actions carried over to endline action plan
		Circulate the strategy for feedback by select health center nurses and program staff	X	Not done; actions carried over to endline action plan

## Site 5: Actions and Interventions

CHW AIM Element	Issue	Action	Done ✓/✗	Result
Recruitment	Recruitment systems are strong, but community institutions/ reps are not actively involved in recruitment outside of the facility staff.	Develop a plan for integrating community institutions or leadership into the recruitment process.	✗	No recruitment conducted during the intervention period; program closed in December 2011
CHW Role	Role is documented and agreed with province, DHMT and facilities, but facility staff change, and new health facility staff are not always up-to-date. Sometimes CHWs asked to do things not in their job description	Hold awareness meetings of the facility staff to clarify role and discuss issues related to asking mentor mothers to do things beyond role	✓	Done
Continuing training	Health facility is not involved in conducting refresher trainings for CHWs	Develop an action plan for involvement of facility staff in refresher training	✗	Not addressed
Individual Performance Evaluation	Health facility staff not asked to provide feedback on CHW performance	Incorporate a column or space for health facility staff feedback on CHW performance into individual performance assessment tool.	✗	Not addressed
Community Involvement	Organization does not actively engage community leaders and members outside the facility at all sites	Complete the outreach pilot currently being initiated	✓	This was done
		Develop a strategy for communicating and involving leaders in advocacy and stigma reduction at the community level.	✓/✗	Strategy not completed
		Involve the community in planning and review of the program (advocacy and stigma reduction)	✓/✗	Regional staff attend monthly health center meetings with community committees to explain what they do and get community more involved

CHW AIM Element	Issue	Action	Done ✓/✗	Result
Referral	<p>No formal referral slips are used as NGO operates out of facilities, internal referral occurs, but health workers do not always address them in a timely manner and feedback is often not received.</p> <p>(Needs further investigation for more detailed action to be developed)</p>	Conduct on the job training for CHWs for documenting referrals for CD4, ART or other care in the comment section of their existing record books to document internal referrals	✗	New referral slip was recommended from another DHMT. That slip is a joint health systems and CHW slip, but organization never got it implemented.
		Define key services for referral to help with data management and analysis	✗	Not addressed
		Enquire about and document internal referral systems, at facilities to help clarify internal referral problems and make concrete, practical recommendations for improving internal referrals	✗	Not done
Opportunity For Advancement (2)	<p>Advancement opportunities within the NGO are limited. The one year fixed contract period limits the organization's ability to create additional opportunities for CHWs</p>	Develop a strategy for creating more opportunities for advancement within the org. such and within the existing contract period for CHWs. Consider creating "senior CHWs" or "expert educators" who are people who meet defined performance criteria. They could get a certificate, be involved in training others and use certificate to demonstrate to other organizations their capabilities when seeking other jobs	✓	<p>Site supervisor positions made available to CHWs before open recruiting is done.</p> <p>The organization also started initiating paid study leave for the CHWs (up to 34 days per year) to help them advance their education and actively open them to additional opportunities within and beyond the organization.</p>
		Continue conversations with HQ about the viability of one year contracts.	✓/✗	This was done but program funding ended so the issue became moot

CHW AIM Element	Issue	Action	Done ✓/✗	Result
Documentation, information management	Documentation is strong, but results and information are not always shared with the health facility staff	Share data and program results with the health facility staff.	✓	Done. Organization started sharing results with facility staff and felt it made a big difference in galvanizing support for the program and the CHWs
Linkages to health system	Feedback from facilities on the NGO program is not routinely collected, analyzed and incorporated. (Feedback to facilities too, as noted above)	Formalize documentation of feedback from health facility about the NGO program.	✗	Not done and program still heavily dependent on NGO
Program Performance Evaluation	Performance assessments are routinely done, but are based mainly on quantitative results. Quality is assessed in supervision, but is not integrated into the annual performance assessment process.	Develop a system for collecting data on quality performance (i.e. , assessments of the quality of service delivery) and incorporate into annual performance assessment process.	✗	Not done
Country Ownership	CHWs are recognized as important, but currently, the majority of support and supervision of CHWs comes from the program (NGO/donor funds) and is not undertaken by MOH.	Link to other NGOs and Institutions implementing CHW programs to discuss sustainability and MOH role in sustainability.	✗	Organization did not do this as country director left and program prepared to close.

**USAID HEALTH CARE IMPROVEMENT PROJECT**

University Research Co., LLC  
7200 Wisconsin Avenue, Suite 600  
Bethesda, MD 20814

Tel: (301) 654-8338

Fax: (301) 941-8427

[www.hciproject.org](http://www.hciproject.org)