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Community Health Volunteer Program Functionality and Performance in Madagascar:

A Synthesis of Qualitative and Quantitative Assessments

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RESEARCH AND EVALUATION REPORT

Community Health Volunteer Program Functionality and Performance in Madagascar: A Synthesis of Qualitative and Quantitative Assessments

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Abbreviations

ACT	Artemisinin-based combination therapy
AIDS	Acquired immunodeficiency syndrome
AIM	Association Intercooperation Madagascar
ANC	Antenatal care
ASOS	Action Socio Sanitaire et Organisation Secours
CARE	Cooperative for Assistance and Relief Everywhere
CHV	Community health volunteer
CHW	Community health worker
CHW AIM	Community Health Worker Assessment and Improvement Matrix
c-IMCI	Community integrated management of childhood illness
CRS	Catholic Relief Services
CSB	*Centre de Santé de Base* (Basic health center)
FGD	Focus group discussion
FP	Family planning
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GH Tech	USAID Global Health Technical Assistance Project
HCB	Basic health center
HCI	USAID Health Care Improvement Project
HIV	Human immunodeficiency virus
IMCI	Integrated management of childhood illness
KM	*Kaominina Mendrika* (health champion community)
KMS	*Kaominina Mendrika Salama* (certified health champion community)
MNCH	Maternal, newborn, and child health
MOPH	Ministry of Public Health
MSIS	Multi-Service Information Systems
NGO	Non-governmental organization
NSA	National Strategy Application (GFATM)
ODDIT	Diocesan Organization for the Development of Taomasina
PSI	Population Services International
RH	Reproductive health
RTI	Research Triangle Institute
SDC	Social development committee
SN2	USAID/SantéNet2
TA	Technical assistant
TB	Tuberculosis
UNICEF	United Nations Children's Fund
URC	University Research Co., LLC
USAID	United States Agency for International Development
WASH	Water, sanitation, and hygiene
WHO	World Health Organization

EXECUTIVE SUMMARY

Introduction

With approximately 3.5 million community health workers (CHWs) around the world, this cadre of frontline service providers represents an invaluable component of the health workforce, providing primary health care to their communities. The Madagascar Ministry of Public Health has scaled up to over 35,000 community health volunteers (CHVs) as of December 2012.

For more than a decade, the U.S. Agency for International Development (USAID) Mission in Madagascar and other partners have invested in the development of a national CHV system to improve access to life-saving primary health care services for rural and remote populations. Presently, the USAID/Santénet2 Project (SN2) aims to increase access to and availability of community-based interventions in 800 communes concentrated in 16 regions of eastern and southern Madagascar. SN2 provides local capacity building, training, and supervision to mobilize over 12,000 CHVs to offer life-saving health services, including family planning counseling and short-acting contraceptives and maternal, newborn, and child health, including community case management for uncomplicated malaria, pneumonia, and diarrheal disease. In general, two CHVs have been elected by their communities from each of the 5,758 targeted villages located more than five kilometers from the nearest health center. MAHEFA, Santénet2's sister project, is scaling up support for integrated community-based activities through an additional 3,500 CHVs in underserved western and northern Madagascar.

USAID/Madagascar asked the USAID Health Care Improvement Project (HCI) and the Global Health Technical Assistance (GH Tech) Project, with technical assistance from the U.S. Centers for Disease Control and Prevention (CDC), to conduct qualitative and cross-sectional studies, respectively, of CHV program functionality and performance. The purpose of this report is to synthesize the findings from the two assessments. Complete findings are available in the respective assessment reports (Wiskow et al. 2013 and Agarwal et al. 2013).

Methodology

An integrative approach was used for this synthesis, bringing together findings from qualitative and cross-sectional study. The result is descriptive analysis of the functionality and performance of CHV programs in Madagascar.

The qualitative assessment used the Community Health Worker Assessment and Improvement Matrix (CHW AIM) toolkit developed by HCI in which CHVs, their supervisors, and other key stakeholders work through a self-assessment of the functionality of the program. CHW AIM defines program functionality in terms of 15 program components, such as recruitment, training, supervision and performance evaluation, incentives, and linkages with the health system, rating each component as a best practice, functional, partially functional, or not functional. This toolkit was supplemented by a supervision component in which interviews and focus group discussions with CHVs and their supervisors were conducted to gain more insight into supervisory practices. Data were gathered on the USAID Santénet2 (SN2) project's support in Atsinanana, Analamanga, and Androy regions. Also included in Androy were CHVs managed by the health centers for which UNICEF supported initial training.

The quantitative component was designed as a cross-sectional survey and included a questionnaire administered to 249 CHVs across 16 districts or district groups providing child and reproductive health services. The questionnaire collected data on CHV demographics, recruitment, training, supervision, motivational factors, supplies and equipment, and referrals. The cross-sectional study also included a performance component to assess the quality of care provided by CHVs. CHVs tasked with community integrated management of childhood illness (c-IMCI) were observed providing care to ill children under five years old and compared to a gold standard evaluation of the same children, evaluated for their ability to assess (including identifying danger signs), classify, treat, or refer appropriately as required by c-

IMCI guidelines in Madagascar. Reproductive health and family planning (RH/FP) CHVs were observed providing FP services to female clients and assessed in two parts: 1) the CHV's procedures in welcoming the client and obtaining basic information on her contraceptive needs, and 2) the CHV's ability to determine the client's eligibility for a method in which she showed interest and the quality of counseling provided on that method.

Results

Both assessments found that CHVs were recruited by members of their communities. CHVs in the cross-sectional study were aware of their role. Participants from Analamanga stated that staff at the health center and district levels and the community had expectations that exceeded the role of the CHV. SN2 participants from Androy also reported that the Regional Health Management Team was unclear about CHV responsibilities and that some village chiefs were not accepting of CHVs. Participants in the qualitative assessment also reported that the communities were unclear as to the role of CHVs. Findings from both assessments were in agreement that initial training was delivered; however, both assessments identified challenges with ongoing or refresher training. Only 54% of c-IMCI CHVs and 31% of RH/FP CHVs reported receiving ongoing training, while CHVs participating in the qualitative assessment reported having to wait more than six months for refresher training. Among RH/FP CHVs, refresher training was associated with a higher performance score; no such correlation was observed for c-IMCI CHVs.

The management of equipment and supplies was viewed as a major challenge, with the majority of CHVs reporting stock-outs, including of basic commodities and life-saving medicines, according to data from the cross-sectional study; yet this component was scored as a best practice by three of the four SN2-supported NGOs participating in the qualitative assessment in Atsiananana. Only slightly more than half of all participating CHVs reported using order forms, which may impact maintenance of sufficient inventory of supplies.

Documentation and information management was found to be a best practice in two regions, functional in one, and partially functional in another. Questions on documentation and information management were not explicitly asked in the cross-sectional study; however, the data do indicate that CHVs complete monthly reports, approximately half of them share these reports with the community on a monthly basis, and the vast majority reported submitting the reports to the health facility (96.4% c-IMCI CHVs, 97% RH/FP CHVs).

Incentives reported were both financial and non-financial in nature, with per diems for attending trainings viewed as a financial incentive originating from their supporting organizations, while official recognition was a benefit received from the communities in which CHVs worked. CHVs in the cross-sectional study also reported that recognition by the community was a benefit of being a CHV. Data from both assessments support the existence of opportunities for advancement for CHVs, with the quantitative data indicating that most CHVs (81% of c-IMCI CHVs, 93.3% of RH/FP CHVs) viewed training workshops as an advancement opportunity.

While qualitative assessment participants scored the referral system as best practice or functional across the participating programs, data from the cross-sectional study show that only 58% of c-IMCI CHVs and 62% of RH/FP CHVs have ever referred a client to a health facility which could indicate either that CHVs are unaware of when to refer clients or are unfamiliar with the process of referring.

The qualitative assessment found that the linkages element was functional in three of the assessed areas and partially functional in the remaining area. Country ownership was scored as functional in two regions, and partially functional in the third.

While supervision was scored as functional by the qualitative participants, the lack of supervisory visits to the CHVs was a clear challenge which was echoed by CHVs in the cross-sectional study. Less

frequent supervisory visits (between one and five visits in the previous 12 months) was associated with poorer performance among c-IMCI CHVs. Tools used during supervision and performance evaluation developed by SN2 were found to be useful. However, supervisors participating in the qualitative assessment suggested that they be revised to be consistent with national, standardized reporting requirements and that they be translated into Malagasy.

Conclusions and Recommendations

Based on the synthesized findings from the two assessments on CHV program functionality, the following recommendations are presented:

- Linkages with the communities should be strengthened, including clarifying CHV roles

- Ongoing trainings should be budgeted for and conducted in both service delivery and management of supplies

- Linkages with the health system should be strengthened, particularly with respect to the referral system

- Supportive supervision, especially visits to CHVs' communities, should be planned and budgeted. Creative approaches to supervising CHVs who live far from the facilities should be explored and tested.

- A national monitoring and evaluation system should be established to inform programmatic decision and performance monitoring. Knowledge and competency of CHVs should be assessed periodically as a means of identifying gaps in knowledge and opportunities for improving performance and quality of care.

I.   INTRODUCTION

A.   Background

Community health workers (CHWs) have long been recognized as having a key role in reducing mortality and morbidity and expanding access to health services in low-resource settings. CHWs are individuals who, with limited training, offer basic health care services and health education at the community level (World Health Organization [WHO], 1989). Across Africa, there is a critical shortage of health workers, defined as less than 2.3 doctors, nurses and midwives per 1000 population (WHO, 2006). In 2005, Madagascar reportedly had 2.9 physicians and 3.2 nurses per 10,000 population (Africa Health Workforce Observatory, 2007). As countries seek to manage their health workforce shortages, the role of the CHW has gained importance (WHO, 1989).

CHWs are often recruited from within their own communities and play a critical role in linking communities with the health system. They provide care that is culturally appropriate and cost-effective, while also encouraging the community to be more engaged in health outcomes (IntraHealth International, 2012). In Madagascar, this cadre is referred to as community health volunteers (CHVs), as they are not remunerated for their services.

B.   Community Health in Madagascar

Across Madagascar utilization of health services is low; over the past several years, use of health services has remained at 32%, with cost of and distance to services remaining the key reasons why those in need did not seek services at health facilities (Institut National de la Statistique de Madagascar [INSTAT], 2010a, INSTAT, 2006, INSTAT, 2005). According to the 2008-2009 Demographic and Health Survey (DHS), only 41% of children under five with fever, 34% of children under five with diarrhea, and 42% of children under five with acute respiratory infection accessed care from a facility. Among women residing in rural areas, 57% included in the DHS stated that distance to the facility was a major barrier to seeking care (INSTAT, 2010b).

1.   Community-based Integrated Management of Childhood Illness and Community Case Management

In 1992, the WHO and UNICEF put forth the Integrated Management of Childhood Illness (IMCI) as a means of addressing diarrhea, pneumonia, malaria, measles, and malnutrition at the facility (Gove, 1997). In 1997, a community-based component was added to IMCI, creating c-IMCI. This approach is based on three programmatic areas: 1) improving the relationship between health facilities and the communities they serve; 2) engaging community-based providers to increase access to appropriate care and information; and 3) integrating promotion of key family practices essential for child health and nutrition (Winch et al., 2002). Through the community case management (CCM) strategy, CHWs are provided with training and support to "provide diagnostics and treatments for pneumonia, diarrhea, and malaria for sick children of families with difficult access to case management at health facilities" (Marsh et al., 2012).

In Madagascar, mortality among children under five is 72 per 1000 live births (INSTAT, 2010b). Many of these deaths are due to preventable or treatable diseases such as malaria, malnutrition, diarrhea, and respiratory infections (Ministère de la Santé Publique, 2009). In 2007, c-IMCI was introduced by UNICEF in collaboration with the public health system. In 2008, USAID began supporting the scale-up of c-IMCI through their support of non-governmental organizations (NGOs) under the Santénet 2 (SN2) Project. In 2010, additional support for the further expansion of c-IMCI was provided through a Global Fund for the Fight Against AIDS, Tuberculosis, and Malaria (GFATM) Malaria National Strategic Application (NSA) grant. This activity provides initial and refresher training for 35,000 c-IMCI/CCM CHVs to expand access to community-based services including CCM for malaria, pneumonia, and

diarrhea to all *fokontany* (villages) (GFATM, 2012). The grant also supported revision and standardization of the national c-IMCI curriculum, reporting, and development of supervision tools.

2.   Community-based Reproductive Health and Family Planning

The fertility rate in Madagascar is high with each woman having an average of 4.8 children and only 23% of women using a modern method of contraception (INSTAT, 2010b). Funding for family planning (FP) and reproductive health (RH) in Madagascar has been dependent upon external sources, such as UNFPA, USAID, and World Bank. In 2006, the Malagasy government, for the first time, allocated resources for contraceptives. CHVs have been trained in delivering FP services, including administration of injectable contraceptives, through a number of USAID programs (Stanback et al., 2010). A 2006 pilot project first trained CHVs to deliver Depo-Provera. Subsequently, the Ministry of Public Health (MOPH) elected to expand and promote the distribution of injectables at the community-level among areas with high functioning CHV programs (Hoke et al., 2011). With the support of USAID, over 4500 RH/FP CHVs had been trained to provide these community-based services as of February 2011, though there has been no evaluation of the quality of these services.

3.   CHVs in Madagascar

In early 2009, immediately prior to the *coup d'état*, the MOPH published the National Community Health Policy to guide the promotion and harmonization of community-based health services by assessing lessons learned from Madagascar's numerous small-scale health initiatives. The policy's primary objectives are to increase demand for health-related services, promote their availability, and establish their local delivery. The National Policy is widely recognized as a major advancement towards formalizing, harmonizing, and strengthening a national CHV program to reach the country's predominantly rural population.

Presently, the MOPH and UNICEF and other partners have been leading an effort to coordinate the growing number of national level stakeholders supporting community-based activities and harmonize approaches with the aim of strengthening one national system. It should be noted that following the 2009 *coup d'état*, USAID was prohibited from providing technical, financial, or material assistance to the Government of Madagascar, including the MOPH.

C.   Purpose of the Synthesis

The aim of this synthesis report is to triangulate findings on the functionality of CHV programs in Madagascar, drawing from two previously conducted assessments. The first, "An Assessment of Community Health Volunteer Program Functionality in Madagascar" (Wiskow et al., 2013), utilized the USAID Health Care Improvement Project's (HCI) Community Health Worker Assessment and Improvement Matrix (CHW AIM) tool to qualitatively examine the program functionality across several groups of key stakeholders. The CHW AIM was supplemented with focus group discussions and in-depth interviews to gain more insight into the supervisory practices of the assessed programs. The second assessment, "Evaluation of the Quality of Community-based Integrated Management of Childhood Illness and Reproductive Health Programs in Madagascar" (Agarwal et al., 2013), used a quantitative questionnaire to capture CHVs' views on program functionality. A knowledge and performance assessment was also conducted.

D.   Description of Assessed Programs

This abridged description of the assessed programs is taken from the qualitative report (Wiskow et al., 2013). At the time of the assessments in September-October 2011, the USAID/Santénet2 (SN2) Project and UNICEF both supported CHV activities in Madagascar. Sponsorship from the SN2 program consisted of providing training, requiring reports on activities, occasionally sending an organizational supervisor to the CHV's site to offer assistance and/or guidance, and having the supervisor conduct a performance evaluation that covered organizational matters (but not clinical skills). Support to CHVs

was provided by UNICEF between 2007-2009 and mostly consisted of training, with the mainstay of support provided by the public health system. CHVs receive health commodities through a commune-level supply point and/or the public health center.

1.   Santénet2

SN2 (2008–2013) is a five-year USAID project implemented by Research Triangle Institute (RTI) International. As described in Box 1, its activities focus on strengthening community-level health services in selected geographic areas to achieve health goals set by the Malagasy Government. SN2 contracted 16 implementing partners (three international organizations and 13 local NGOs) to apply the *Kaominina Mendrika Salama* (KMS)—or certified champion communes—approach. KMS empowers communities and makes health services accountable. KMS seeks to strengthen participatory community development by 1) setting up an organizational framework that includes establishing a social development committee (SDC) in each community and 2) building the capacity of community leaders in needs assessment, action planning, and the monitoring of health interventions. SDCs comprise community leaders who supervise the CHV from the community's standpoint, specifically with respect to awareness raising, demand promotion, and stimulation activities. SN2 targets 800 *Kaominina Mendrika (KM),* or health champion communities, in 16 regions (of 22), covering about half of the population.

Box 1: Santénet2's key roles in supporting CHVs in Madagascar

Enhancing CHV service delivery in communities more than five kilometers from a health center;

Supporting more than 12,000 CHVs who provide information and services in maternal, newborn, and child health (MNCH); nutrition; FP and RH; malaria; sexually transmitted diseases, HIV and AIDS; and water, sanitation and hygiene (WASH);

Empowering female adolescents and young women (ages 15–24) to become pro-active managers of their health to improve health outcomes over time;

Expanding the demand for and use of community health services through health promotion and information and education campaigns;

Improving CHV training while fostering stronger linkages among stakeholders and community supply chains for essential medicines and supplies; and

Promoting the adoption of more frequent supervisory visits to CHV work sites (RTI, 2008).

SN2 employs a conceptual framework consisting of three components: 1) developing and strengthening key aspects of the community health system; 2) empowering community participation and accountability in setting and achieving community health goals; and 3) linking the two previous components to have a greater impact in reducing maternal, child, and infant mortality, the fertility rate, chronic malnutrition in children under five, and malaria prevalence. SN2 also seeks to expand access to water, sanitation and hygiene and works to maintain a low HIV prevalence rate. SN2's interaction with the MOPH is limited to coordination and information sharing.   The project uses independent supervisors to provide ongoing support to CHVs.

Of the more than 12,000 c-IMCI and RH/FP CHVs supported by the SN2 Project, just under one quarter were based in the three regions included in the qualitative assessment (see Table 1). At the time of the evaluation, SN2 was preparing to phase out its CHV activities by July 2013.

Table 1: Estimated number of community health volunteers, by region and source of training, 2012

Region	Population (est. 2004)	Number of CHVs	
		SN2[1]	UNICEF trained[2]
Diana	485,800	0	0
Sava	805,300	793	0
Itasy	643,000	357	0
Analamanga	2,811,500	608	0
Vakinankaratra	1,589,800	1133	0
Bongolava	326,600	0	0
Sofia	940,800	0	0
Boeny	543,200	235	30
Betsiboka	236,500	0	66
Melaky	175,500	0	
Alaotra-Mangoro	877,700	555	374
Atsinanana	1,117,100	1199	36
Analanjirofo	860,800	870	310
Amoron'I Mania	693,200	704	0
Haute Matsiatra	1,128,900	1057	0
Vatovavy-Fitovinany	1,097,700	1145	0
Atsimo-Atsinanana	621,200	582	95
Ihorombe	189,200	306	0
Menabe	390,800	0	
Atsimo-Andrefana	1,018,500	1080	254
Androy	476,600	981	312
Anosy	544,200	453	0
	17,573,900	**12,058**	**1476**

Sources: [1]Personal communication from Dr. Josoa Samson, Director, Community Health System, SN2, February 2012; [2]UNICEF, 2012.

2. UNICEF initiated c-IMCI Program

UNICEF Madagascar operates within the overall framework of its maternal/child survival and development program and focuses on CHV activities related to child health, hygiene, and nutrition (see Box 2). It promotes CHVs as a cost-effective way to improve health outcomes of those would otherwise lack access to treatment.

Box 2: UNICEF's key roles in supporting CHVs in Madagascar

Scaling-up the c-IMCI initiative in 26 out of 111 districts, covering 252,800 people.

Supporting CHVs to educate people about the importance of screening mechanisms for early detection of malnutrition. UNICEF worked with partner organizations to screen 260,000 children in southern Madagascar in 2011, while also launching a campaign there to distribute supplementary food to help prevent malnutrition (UNICEF, 2012).

Strengthening the relationship between health services and communities and improve selected family practices (Agarwal et al., 2011).

Training CHVs on c-IMCI.

Training CHV supervisors on c-IMCI in health centers.

Encouraging CHV supervision.

UNICEF launched c-IMCI training for CHVs in Androy in 2009, on a request from the local NGO Action Socio Sanitaire et Organisation Secours (ASOS), when the region experienced a nutrition emergency. The first phase of training was a pilot and targeted 12 of 19 communes. UNICEF financed the training and initial stock of equipment and supplies, such as management tools and medicines, and contracted ASOS for six months to implement the pilot phase.

II. METHODOLOGY

A. Qualitative Assessment

The abridged description of the qualitative methodology presented below is taken from "An Assessment of Community Health Volunteer Program Functionality in Madagascar" (Wiskow et al., 2013).

The objectives of the qualitative assessment were to examine: 1) the functionality of the CHV program in Madagascar in three regions following the 15 program critical components of HCI's CHW AIM toolkit (see Figure 1); and 2) CHV supervisory practices. The assessment looked at SN2-supported activities in all three regions and support for UNICEF-trained CHVs in one. Both were assessed in September 2011, not for comparative purposes, but rather to facilitate the sharing of experiences and lessons learned. To assess Madagascar's CHV program qualitatively, the assessment applied two approaches, as depicted in Figure 2: the CHW AIM and a qualitative assessment of supervision using focus group discussions (FGDs) and interviews.

Figure 1: CHW program components and interventions examined in the CHW AIM Toolkit

Human Resource Management
CHW role
Opportunity for advancement
Individual performance evaluation
Recruitment

Capacity Building
Initial and continuing training
Supervision
Program performance evaluation

Support
Equipment and supplies
Incentives
Community involvement

Links
Documentation and information
Management
Referral
Linkages to Health System
Country ownership

Health Service Interventions
MNCH
HIV
TB
FP
WASH

Figure 2: Overview of the qualitative assessment methodology
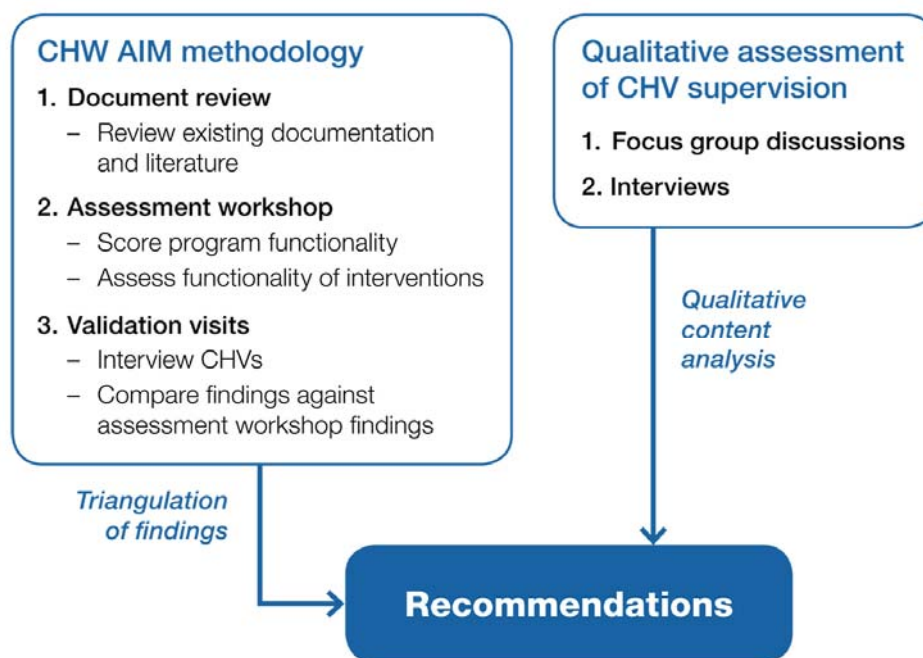
1. Sampling

Selecting regions

Selecting regions was closely coordinated with the team conducting the cross-sectional study to ensure comparability of findings. Analamanga is in the center of Madagascar and surrounds the capital. With a population of 2.65 million, it is divided into eight districts and 132 communes. In this region, Association Intercooperation Madagascar (AIM) was the only NGO implementing the SN2 program. Atsinanana is a rural region on the east-coast. Its population was estimated as 1.12 million in 2004. It is divided into seven districts. The four NGOs that implemented the SN2 program here were CRS, Cooperative for Assistance and Relief Everywhere (CARE), Multi-Service Information Systems (MSIS), and Diocesan Organization for the Development of Toamasina (ODDIT), each having a distinct organization and structure. Androy is in the south and characterized by chronic food insecurity, poverty, a low educational level, lack of access to water, lack of food, and malnutrition. It is divided into four districts, 51 communes, and 881 *fokontany* (villages). Both SN2 and the program of support for UNICEF-trained CHVs were included in the assessment for the purposes of sharing experiences and lessons learned among participants, not for comparative purposes. UNICEF was one of the first organizations to pilot CHV programs in Androy, so the spread of its reach, in terms of the number of CHVs it had engaged, was extensive.

Selecting communes

For each region, the assessment team selected a number of communes to ensure 1) broad coverage of communities and participants and 2) that those who participated in the workshop did not participate in the validation visits. Some of these communities were also the sites for interviews with community representatives for the supervision research.

Selecting workshop participants

Participants were carefully selected so the workshop would reflect a balanced representation of all program staff groups (managers, supervisors, and CHVs) and other key stakeholders involved in CHW activities (health and other public authorities at the district and regional levels and representatives of

partner and donor organizations). Just under half (45%) the participants were female. Overall, fewer than half the supervisors were female, substantially more than half of whom were in Analamanga.

To select participants, the following criteria were applied:

- Participants should represent several districts in each region.
- CHV participants should include both c-IMCI and RH/FP CHVs.
- Other workshop participants should represent all staff levels of the program and relevant stakeholders.
- CHVs interviewed during validation visits should not be the same as those who participated in the workshop.
- FGD and interview participants for the supervision component should not be the same as those who participated in CHW AIM assessment activities.

Furthermore, as part of KMS, the community appoints two individuals to monitor the implementation of KMS activities. Among community members, they are the best informed about KMS activities, so assessors interviewed them as community representatives during validation visits. Other community representatives were also selected, according to their role and function. Semi-structured interviews were conducted with SDC members in each SN2-supported region.

For the supervision assessment, three groups were selected: CHVs, supervisors, and community representatives involved in supervision for a total of 130 participants. Supervisors (district officials) were invited while all other participants were selected on the basis of their not having participated in the CHW AIM. CHVs were selected from the locality's highest and lowest performing CHVs. The medical inspector responsible for health services in the district and NGO representatives also participated.

2.   Data Collection

The CHW AIM toolkit (Crigler et al., 2011) helps organizations 1) assess the functionality of their CHW programs and 2) improve program performance. It has been applied in 25 countries by a wide range of organizations to assess and improve CHW programs. The CHW AIM methodology has three main steps: 1) document review, 2) assessment workshop, and 3) validation visits.

The methodology guides stakeholders through a participatory self-assessment to rate the functionality of each of 15 program components—such as recruitment, training, and incentives—needed for a CHW program to function effectively, rating each component as a best practice, functional, partially functional, or not functional. The CHW AIM toolkit also includes checklists of health interventions in maternal, newborn, and child health (MNCH), HIV and AIDS, and tuberculosis (TB) care (Crigler et al., 2011). New intervention checklists for family planning and water, sanitation and hygiene (WASH) were developed specifically for this assessment. These checklists help stakeholders assess the functionality of services delivered by CHVs and were adapted to the Malagasy context in an August 2011 stakeholder workshop.

Qualitative assessment activities were conducted from September 14 to October 2, 2011. The core assessment team comprised an international technical consultant and a local coordinator. In each region a team of two regional experts supported local preparatory activities, including liaising with CHV program managers and reviewing documents; they also assisted in facilitating the workshop, FGDs, and interviews and in documenting the assessment results.

The assessment team's working languages were French and Malagasy. All activities involving participants and stakeholders were conducted in Malagasy, except in Androy, where local facilitators communicated in the local dialect (Antandroy). Some tools (functionality and intervention lists, functionality scoring and documentation sheet, and FGD and interview guides) were translated from French into Malagasy. The document review guide was translated into French.

Document review

The assessment began with a review of documents by the assessment team to gather necessary background information, guided by a standardized, structured questionnaire (Crigler et al., 2011, pp VI-2–4). Its results helped the assessment team lead the workshop with targeted information. In Madagascar two programs in two regions lacked the required documentation: the Catholic Relief Services (CRS) program in Atsinanana (an SN2 implementing partner) and the program of support for UNICEF-trained CHVs in Androy.

Assessment workshop

The CHW AIM methodology suggests that one program of support be assessed per workshop but is sufficiently flexible to enable multi-program assessments through program-specific break-out groups. For this assessment, consensus among NGOs supported by a common source of support was facilitated but not forced where differences were identified. The workshops engaged a diverse group of stakeholders in discussing and assessing the functionality of CHV program components and interventions provided by CHVs. Stakeholders first individually examined their own experience with their program to rate functionality, and then came to consensus as a group. The three regional workshops were managed as follows:

- In Analamanga (SN2), the assessment workshop focused on one program of support managed by one NGO. Consensus was facilitated.

- In Atsinanana (SN2), four NGOs manage CHV activities, so participants split into NGO-specific groups in scoring functionality.

- In Androy (SN2 and UNICEF), participants split into three groups: two groups of SN2-funded NGOs and one group for UNICEF-trained and government-supported CHVs.

Stakeholders used a matrix that included the definition of each component and four levels of functionality criteria: Non-functional (score of 0), partially functional (score of 1), functional (score of 2), or a best practice (score of 3). The criteria used at each level for each component described situations commonly seen in CHW programs and provided enough detail for stakeholders to rate the component from their perspective. To be considered functional, each component must have been rated at least 2 (functional), giving a minimum cumulative score of 30. The group then identified gaps in functionality and discussed possible steps for improvement.

Once the program components were scored and consensus was achieved, stakeholders turned to the lists of the five interventions, devoting the second part of the workshop to scoring them. Working as a group, stakeholders scored interventions according to the expected CHV tasks; if they agreed that the expected tasks were carried out, the intervention was considered functional.

The intervention lists in the CHW AIM toolkit were developed by technical experts and other stakeholders based on available international evidence at the time the lists were drafted. For the most part, the intervention content was taken from WHO guidelines and relevant peer-reviewed publications in areas with emerging evidence. Since CHWs have a range of competencies depending on the specific program and/or country context, the lists were not intended to be exhaustive or rigid. Rather the listed interventions represent expert opinion on those interventions appropriate for delivery by a trained CHW in most settings. A pre-assessment stakeholder meeting (held August 4, 2011 in Antananarivo) reviewed these lists and made modifications to better align them with the tasks Malagasy CHVs were expected to perform. For this assessment the MNCH, FP, and WASH intervention lists were used for the SN2 activities, and the MNCH interventions were used for the UNICEF-trained CHVs, in alignment with the nationally defined package.

Validation visits

To validate the scores from the workshop and learn more about implementation, the methodology calls for visits to communities for semi-structured interviews with up to three CHVs who did not attend the workshop. In Madagascar, validation visits in each of the three regions were conducted in two communities, and interviews were conducted with two CHVs in each community visited.

Interviews conducted during the field visits addressed:

1. CHW AIM: Two regional experts each interviewed one c-IMCI CHV or RH/FP CHV (from among CHVs that had not participated in the workshop).

2. Supervision: The national coordinator and international expert used the questionnaire guide to conduct semi-structured interviews with the two relevant SDC members.

Only one supervisor in Androy supporting UNICEF-trained CHVs was interviewed. No community representatives were interviewed during the visits to UNICEF-trained CHVs.

Follow-up

The CHW AIM methodology has three main steps (document review, assessment workshop, and validation visits), plus an additional step which was applied in this assessment. This fourth step provides that during the assessment workshop, stakeholders engage in discussions about the strengths and weaknesses of their program and begin to develop an action plan for improvement as a follow-up. Action plans started during assessment workshops were further informed by the validation visits, and complete action plans included suggested ways to monitor implementation and a plan for periodic progress review. For this assessment, suggestions were gathered from all workshop participants to inform further discussion and planning by key stakeholders.

3. Supervision Component

Key stakeholders provided input to determine the aspects of supervision—pertinence, usefulness, strengths, and weaknesses—that should be explored and agreed on. Their comments informed the development of the interview and FGD guide and recommended targeting CHVs, supervisors, and communities.

FGDs and semi-structured interviews were the main means of exploring perceptions and recommendations of program managers, CHVs, and supervisors. Three FGDs were held with each of these target groups. Group size ranged from five to 10 participants.

Regional experts used the discussion guides to conduct the FGDs and interviews, which typically lasted 60-100 minutes. Notes were taken by a member of the assessment team and were reviewed and consolidated in Malagasy before being summarized in French.

4. Analysis

Assessment information was compiled and triangulated in accordance with the CHW AIM methodology. All information from the FGD and interview summaries was analyzed using qualitative content analysis to extract, identify, and structure major topics and statements. The considerable information was structured along pre-determined themes.

B. Cross-sectional Study

The abridged description of the cross sectional study is presented below and taken from the full report, "Evaluation of the Quality of Community Based Integrated Management of Childhood Illness and Reproductive Health Programs in Madagascar" (Agarwal et al., 2013).

1. Study Design and Population

A cross-sectional survey was conducted of a systematic sample of 149 CHVs trained to provide c-IMCI (c-IMCI CHVs) and 100 CHVs trained to provide RH/FP (RH/FP CHVs) services in Madagascar. Field data were collected over a three-week period in September–October 2011, which falls outside the peak season for malaria in Madagascar.

2. Sampling

The cross-sectional study included knowledge and observational performance assessments of CHVs; these parameters were used in determining the sample size. The sample size estimate was calculated conservatively assuming that c-IMCI CHVs correctly prescribe recommended treatments at least 60% of the time. A minimum sample size of 688 patient encounters was calculated with a 5% margin of error (80% power, alpha of 5%, design effect of 2).

The sampling frame included all CHVs that had been trained in c-IMCI at least six months prior to the survey and had demonstrated functionality, defined as having reported treating ill children or providing FP counseling and services.

Multi-stage sampling was used to select CHVs to participate in the survey. A list of districts with active CHVs was compiled: a total of eight districts with CHVs supported by MOPH/UNICEF and 64 districts with CHVs supported by SN2. Districts were stratified by funding support (UNICEF and USAID) and grouped so districts or district-groups contained a minimum of 15 c-IMCI CHVs in MOPH/UNICEF-sponsored areas or 15 CHVs of each type, c-IMCI and RH/FP, in SN2 coverage areas. If a district had less than the required 15 CHVs, they were grouped geographically to create a final list of "district-groups" including either a one-district or two-district area that contained at least 15 CHVs. A total probability sample of 225 c-IMCI CHVs and 150 RH/FP CHVs (to ensure a minimum of 688 observed ill child encounters and approximately 500 female FP client encounters), was selected and included over-sampling by 50% to account for anticipated field challenges, including the likelihood that some selected CHVs would be unavailable at the time of data collection.

3. Data Collection

Selected CHVs were requested to travel to the nearest facility with a sufficient number of clients to allow for five assessments of ill children and five encounters with women of reproductive age. CHV performance was observed in clinical encounters with ill children under age five for c-IMCI CHVs or women of reproductive age arriving for consultation for RH/FP CHVs. Expert observers and gold standard evaluators were recruited from the existing pool of c-IMCI and RH/FP trainers and supervisors. They were retrained for the cross-sectional study. C-IMCI CHVs were evaluated for their ability to assess (including identifying danger signs), classify, treat or refer appropriately ill children under five years old as required by c-IMCI guidelines in Madagascar. RH/FP CHVs were assessed in two parts: 1) CHV's procedures in welcoming the client and obtaining basic information on her contraceptive needs, and 2) CHV's ability to determine the client's eligibility for a method in which she showed interest and the quality of counseling provided on that method.

The day before the observed clinical encounters, a standardized questionnaire was administered to each CHV. CHVs were asked questions to determine their demographics, individual characteristics, and self-reported measures of their program-site functionality based on a list of essential components for CHV programs. These components address program functionality from the CHV's viewpoint and related to recruitment, CHV role, initial training, continuing training, equipment and supplies, supervision, individual performance evaluation, incentives, community involvement, referral systems, opportunities for advancement, documentation and information management linkages to the health system, program performance evaluation, and country ownership. Questions related to each component, except for the final three, which are system level and could not be measured for individual CHVs.

4. Analysis

Performance scores were developed for c-IMCI CHVs and for RH/FP CHVs. For c-IMCI CHVs, the components of the performance score included: assessment of nutrition status, identification of chief complaint, assessment of symptoms associated with chief complaint, classification, and treatment choice. The performance score was used as the outcome indicator in a multivariable linear regression model to identify factors associated with performance. Univariate analysis was performed to identify CHV characteristics, child characteristics, knowledge score, components related to program functionality, and other variables as potential correlates to CHV performance. A multivariable linear regression model was developed by first fitting a full model including all potential correlates with a p-value of <0.1 in the univariate analysis and then, in backwards stepwise progression, manually removing variables not associated with performance scores at the alpha 0.05 level.

For RH/FP CHVs, components related to functionality of the CHV program and responses to the contraceptive knowledge test were calculated as weighted binomial or multinomial proportions with 95% Wilson score confidence intervals. A performance score was also calculated for each CHV by averaging mean scores from the two parts (equally weighted). Multivariable linear regression was used to assess variables on demographic or other characteristics and program functionality as potential correlates of the CHV performance scores. A full model was fit with all potential correlates and then, in backward stepwise progression, variables that were not associated with performance scores at the alpha 0.05 level were manually removed.

Data related to program functionality were analyzed descriptively.

C. Synthesis

This synthesis employs an integrative approach as defined by Dixon-Woods and colleagues (Dixon-Woods et al., 2005). The objective was to combine the data from the two assessments to deepen our understanding of CHV program functionality in Madagascar. Thus, analysis was more descriptive in nature. Findings were reviewed and categorized along the 15 functionality components described in the CHW AIM. Of the 15 components included in the CHW AIM, only four capture data at the individual CHW level: initial and ongoing training, supervision, and individual performance evaluation. The cross-sectional study conducted analyses on the correlation between these components and individual CHV performance. This synthesis seeks to augment interpretation of these findings with those from the qualitative assessment.

III. RESULTS

A. Description of Study Sample

The qualitative assessment and cross-sectional study covered a range of geographic locations in Madagascar (see Figure 3). The cross sectional survey sampled from all areas where SN2 and UNICEF supported programs had functional CHVs at the time of the study.

1. Qualitative Assessment

There were 130 participants in the qualitative assessment, and just under half (45%) were women. Workshop participants included CHVs (n=66), *Centre de Santé Base* (CBS) and technical assistant supervisors (n=29), program managers (n=13), community development committee representatives (n=13), and public health authorities (n=9). Of the 130, 75 participated in the assessment workshop and validation visits, and 55 participated in FGDs and interviews on supervision.

Figure 3: Geographic coverage of the qualitative assessment and cross-sectional study
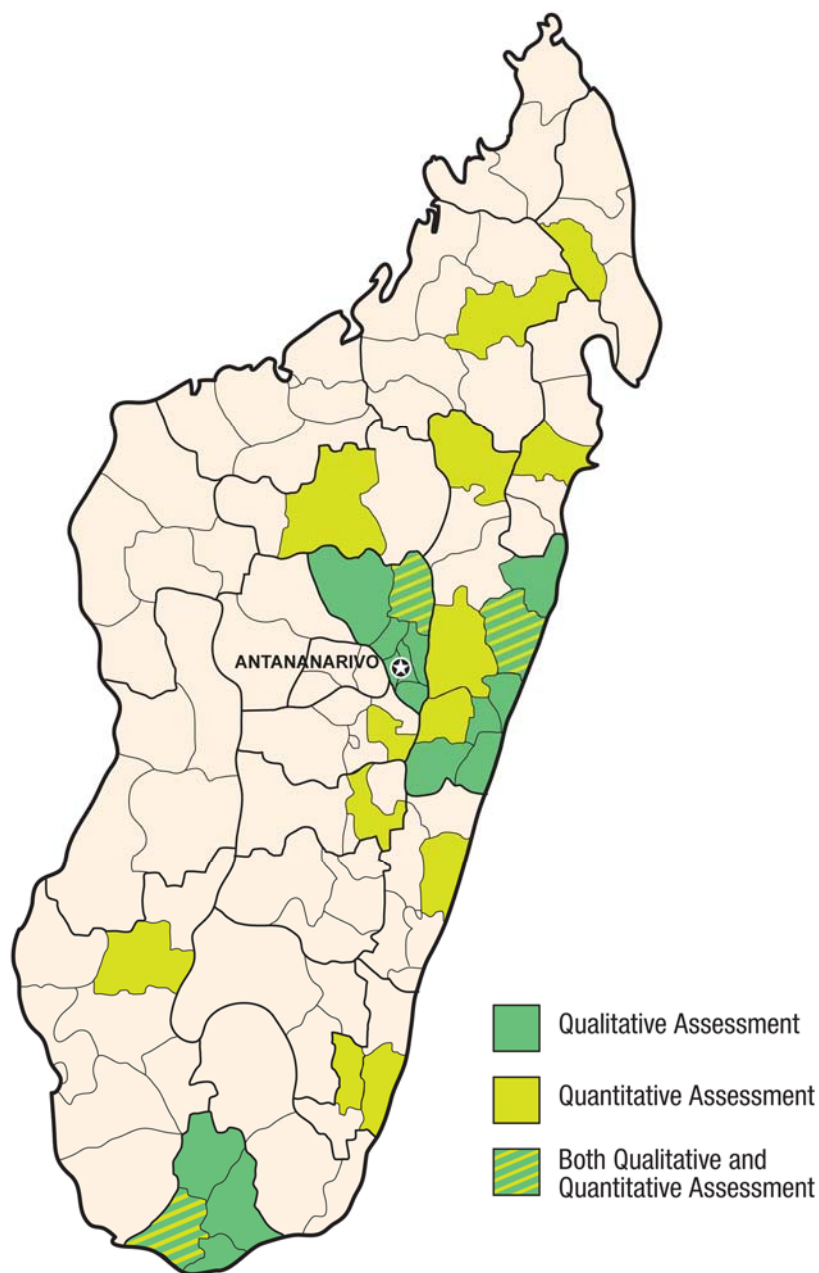
2.   Cross-sectional Study

The final sample included in the study consisted of 249 CHVs (149 c-IMCI CHVs and 100 RH/FP CHVs). The participants included in the cross-sectional study tended to have between five and nine years of education (85.9% c-IMCI CHVs, 57.0% RH/FP CHVs), be between the ages of 30 and 45 (60.4% c-IMCI CHVs, 54.0% RH/FP CHVs), and be based between five and 20 kilometers from the nearest health facility (75.5% c-IMCI CHVs, 77.8% RH/FP CHVs). There was an equal distribution between males and females. Most participants had been working as a CHV between one and five years (79.2% c-IMCI CHVs, 85.8% RH/FP CHVs), but very few had previous experience (88.6% c-IMCI CHVs, 89.0% RH/FP CHVs).

B. CHV Program Functionality

Recruitment was scored as a best practice by CHW AIM workshop participants across all regions. The cross-sectional study found that over 80% of CHVs were recruited by members of the community, predominantly by the *fokontany* chief, though the chief of the CSB also played a role in recruitment.

Overwhelmingly, CHVs in the cross-sectional study reported being aware of their **role** and had a written job description. The CHW AIM, which assessed understanding and awareness of the CHV role from multiple perspectives, revealed that while CHVs were aware of their role, the community had less clarity around this issue. In Analamanga, CHV role was rated functional since community members, health staff, and others at the district had expectations for CHVs that went beyond the scope of work for CHVs. In Atsinanana, CHV role was scored as a best practice; however, it was noted by participants that communication between the community and CHVs needed to improve. One suggestion from CHVs participating in FGDs was for supervisors to share their supervisory reports with CHVs and communities as a means of clarifying roles and responsibilities. A review of the documentation, as per the CHW AIM methodology, revealed only one NGO out of seven reviewed had written job descriptions for CHVs.

All of the CHVs included in the cross-sectional study reported receiving **initial training** in c-IMCI or RH/FP. In the CHW AIM, initial training was scored well as either a best practice or functional, though across assessed activities it was shared that the government and community were not involved in the training.

Ongoing training was reported to be more limited in the cross-sectional study, with only 54% of c-IMCI CHVs and 31% of RH/FP CHVs stating they received refresher training. This is supported by findings from the CHW AIM in Analamanga where participants shared that CHVs had to wait more than six months for refresher training. In Androy, ongoing training was scored as functional because while there was an established plan, it was not implemented. In contrast, participants from Atsinanana rated ongoing training as best practice as review meetings led by the community were held monthly, during which time CHVs received feedback from CSB staff-supervisors and community representatives. The cross-sectional study found no significant correlation between refresher c-IMCI CHV training and performance, while refresher training after the initial FP training was associated with an increased RH/FP CHV performance scores of 13.2 points [95% confidence interval (6.7, 19.7)].

Across the programs and regions involved in the CHW AIM there was a range of scores for **equipment and supplies**. In Analamanga, this component was rated as only partially functional due to regular stock-outs of essential medicines. These stock-outs were reported to happen two to three times per year, lasting one month or longer. In Atsiananana, where four NGOs participated in the CHW AIM assessment, there was disagreement; three rated equipment and supplies as best practice while one rated this component functional. In Androy, participants agreed that the component equipment and supplies was classified as partially functional due to long and regular stock-outs, particularly for malaria treatment. The challenge of stock-outs was echoed by those CHVs participating in the cross-sectional study, with 67% of c-IMCI CHVs and 70% of RH/FP CHVs reporting stock-outs within the six months prior to data collection. Among those reporting stock-outs in the six months prior to the data collection, the mean number of stock-out occurrences was 1.4 for c-IMCI CHVs and 1.8 for RH/FP CHVs. C-IMCI CHVs reporting stock-outs reported most frequently having shortages of paracetamol (27.7%), cotrimoxazole (23.4%), artemisinin-based combination therapy (ACT)(22.3%), and oral rehydration salts (22.3%); RH/FP CHVs reported shortages of ACT (25%), pilplan (20%), injectable contraceptives (16%), and paracetamol (15%).

Maintaining an adequate inventory of supplies and medication was found to be a notable challenge for CHVs participating in the cross-sectional study (57.7% of c-IMCI CHVs, 38% of RH/FP CHVs). Only 58.4% of c-IMCI CHVs and 56% of RH/FP CHVs reported using supply order forms in their work; 74.5%

of c-IMCI CHVs and 77% of RH/FP CHVs reported using inventory list forms. Approximately half of all CHVs stated they re-stocked supplies when needed (51.7% of c-IMCI CHVs, 48% of RH/FP CHVs).

Approximately half of the CHVs reported receiving a formal **performance evaluation** in the previous 12 months (48.3% of c-IMCI CHVs and 52% of RH/FP CHVs). These evaluations were conducted most often by the chief of the nearest CSB (52.8% of c-IMCI CHVs, 55.8% of RH/FP CHVs) (Figure 4).

Figure 4: Person conducting CHV performance evaluation, by CHV type
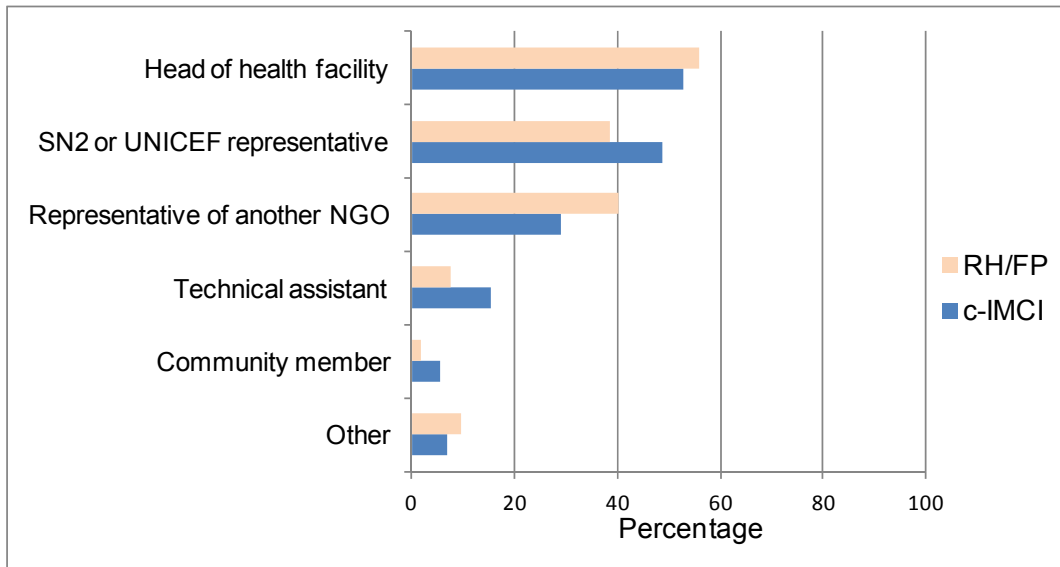
According to CHVs, multiple methods of evaluation were employed to assess CHV performance, with asking CHVs questions about their activities being the most frequently cited method used (see Figure 5). Simulated patient encounters and direct observation of service delivery were much less frequently performed.

Figure 5: Method of CHV performance evaluation, by CHV type
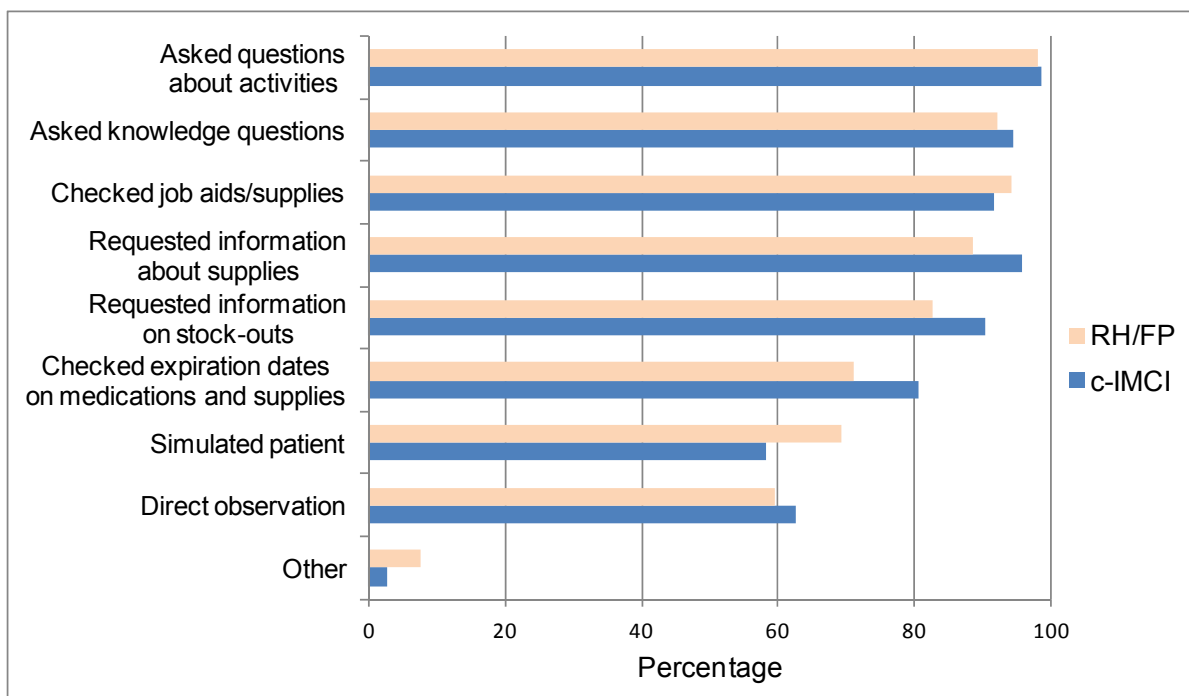
In addition to various supervisors and methods of evaluation, a variety of skills were also assessed during performance evaluations. The quantitative findings (Figure 6) were supported by statements made by CHVs in the qualitative assessment, who reported that supervisors reviewed activity reports, documents, and stocks of materials and supplies. CHVs in Androy reported that simulation exercises were performed during supervision; in Analamanga, CHVs reported sharing experiences, explaining problems, identifying solutions, and creating and reviewing action plans.

Figure 6: CHV skills assessed during formal performance evaluations, by CHV type[1]

[1]Some c-IMCI CHVs were cross-trained in RH/FP and vice versa

Documentation and information management was scored as best practice in two of the regions participating in the CHW AIM, functional in one region, and partially functional in one region. The challenges raised by workshop participants in the two regions with lower scoring included use of data in decision making and limited data exchange, including disseminating C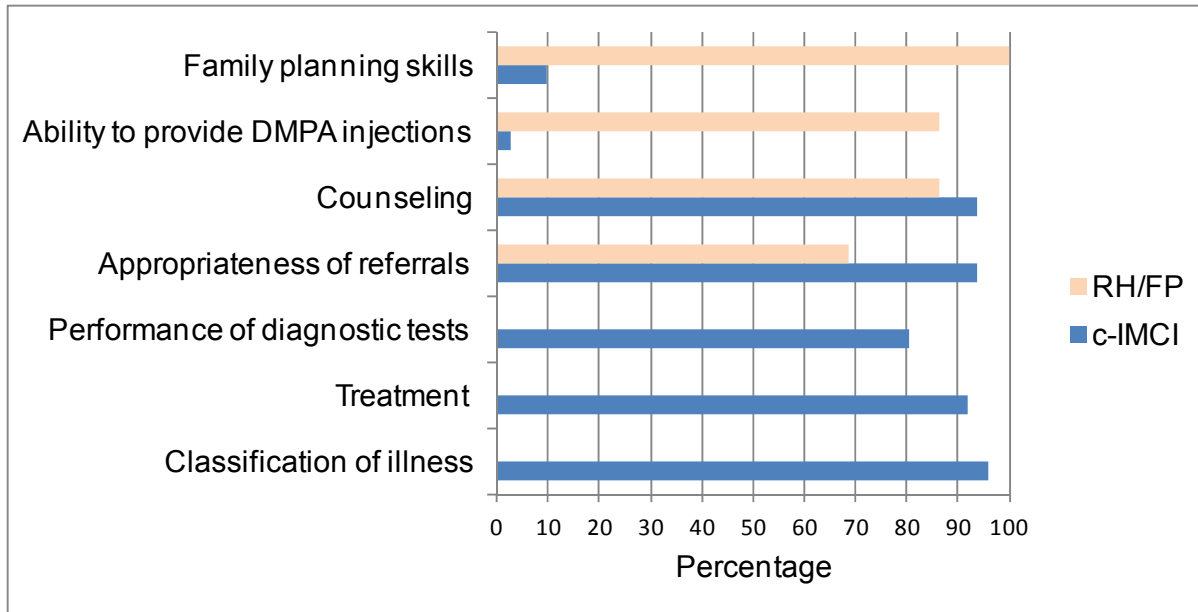HV activity reports to the community and engaging in community-supervisor discussions. CHVs participating in the cross-sectional study universally reported completing monthly reports for the CSB (98% of c-IMCI CHVs and 100% of RH/FP CHVs). CHVs indicated they used these reports as a means of providing information to health facilities or supervisors, planning work, monitoring the number of clients seen, and monitoring and requesting supplies. As noted in the methodology section above, explicit questions on linkages to the health system were not included in the quantitative questionnaire administered to CHVs as this component was considered outside their scope of knowledge. However, CHVs were asked questions regarding their reporting and documentation practices. Over 90% reported submitting monthly activity reports. The majority of CHVs submitted reports to supervisors and/or the CSB. Over 50% of CHVs discussed their report results with other CHVs always or most of the time. Approximately 51% of c-IMCI CHVs and 60% of RH/FP CHVs indicated sharing their reports with the community on a monthly basis.

The provision of **incentives** was rated as functional in Analamanga, Atsinanana, and by the SN2-supported CHVs in Androy, and best practice among MOPH/UNICEF-supported CHV activities in Androy. In the SN2 Project in Androy, it was agreed that communities did not contribute to financial or in-kind incentives for CHVs. CHW AIM participants from Atsinanana reported that incentives were limited to any financial gain made from selling medications or per diems for trainings. There was variation among the different NGOs supported by the SN2 Project in Atsinanana; while some reported

the community providing some gifts to CHVs, others reported that the community offered no incentives to CHVs. Documentation from these programs revealed that, at the time of data collection, the MOPH did not offer financial support. Any incentives that were received were based on performance, though these were not standardized across CHV activities, as financial incentives are part of tuberculosis and nutrition CHV programs. As with Atsinanana, Analamanga CHW AIM participants noted that any financial incentives were the result of selling medications or per diems for participating in trainings or supervision meetings. Non-financial incentives included the actual training, along with other materials, such as backpacks or raincoats. In Androy, where the component was scored as best practice by the UNICEF-supported participants, it was shared that incentives provided during trainings were both financial and non-financial; validation visits as part of the CHW AIM approach revealed that CHVs received recognition and thanks during community meetings. Data from the quantitative report indicate that per diems for training were viewed by CHVs as an advantage of the position (92% of c-IMCI CHVs, 96.7% of RH/FP CHVs); however, only 5.8% of c-IMCI CHVs and 1.1% of RH/FP CHVs viewed regular finances from their place of work as an advantage. Although CHVs are volunteers, 6% of c-IMCI CHVs reported receiving regular monetary income for their work as a motivating factor. CHVs did view official recognition by the community as an incentive (72.5% of c-IMCI CHVs, 83% of RH/FP CHVs), indicating that non-financial incentives may be a powerful motivating factor for CHVs.

Community involvement was scored as best practice in Analamanga and Atsinanana, functional in the SN2 Project in Androy (where participants shared that because CSB and technical assistant supervisors did not make visits to the CHVs, they had little interaction with the communities), and partially functional among MOPH/UNICEF CHVs in Androy, where the community occasionally participated in CHV activities. The cross-sectional study found that 29.5% of c-IMCI CHVs and 17% of RH/FP CHVs felt that gaining the respect of the community was their biggest challenge, and 24.8% of c-IMCI CHVs and 12% of RH/FP CHVs felt that more community support was necessary to improve their work. However, CHVs overwhelmingly felt happy to be able to help their communities as a CHV (92% of c-IMCI CHVs, 95% of RH/FP CHVs).

The **referral system** was scored as a best practice in two regions and functional in two regions in the qualitative assessment. However, in both regions where the system was rated as best practice, it was noted that feedback from the facility to the CHV was not always provided. In Androy, participants rated the referral system as functional because communities reportedly had limited transportation to get to the health center and complete the referral. Of the CHVs participating in the cross-sectional study, only 58% of c-IMCI CHVs and 62% of RH/FP CHVs reported ever referring a client to a health facility. Among those who had, the referral form was almost always completed (83% of c-IMCI CHVs and 98% of RH/FP CHVs). There was a greater tendency for counter-referrals—the flow of information back to the CHV—to always be given to c-IMCI CHVs (72%), compared to RH/FP CHVs (48%). However, a notable proportion of both c-IMCI and RH/FP CHVs reported never receiving a counter-referral (24% and 38%, respectively).

The **opportunity for advancement** component was scored as best practice in Analamanga, Atsinanana, and the UNICEF-trained CHVs in Androy, but as functional for SN2-trained CHVs in Androy. Sixty-seven percent of c-IMCI CHVs and 75% of RH/FP CHVs participating in the cross-sectional study believed that there were opportunities for advancement. Of those who did agree that there were opportunities for advancement, a variety of opportunities were mentioned (see Table 2).

CHW AIM participants rated program **linkages to the health system** as functional in Analamanga, Atsinanana, and the SN2 program in Androy, but only partially functional in the MOPH/UNICEF CHV activities in Androy. Reasons for the functional score included: lack on integration in use of data; lack of material support for CHVs; and restrictions on the type of interactions permitted between SN2 and the public health system. In the UNICEF-trained program in Androy, CHW AIM participants agreed that there was some support by the public health system.

Table 2: Types of advancement opportunities by CHV type

Type of advancement opportunities	c-IMCI CHVs (n=100)	RH/FP CHVs (n=75)
Position at health facility	30%	45.3%
Part-time work at health facility	37%	41.3%
Technical assistant position	25%	37.3%
Attend training workshops	81%	93.3%
Learn new technical skills	76%	81.3%
Other	17%	18.7%

Country ownership was scored as functional in Analamanga and Astinanana and partially functional in both programs in Androy. The lack of national budget for CHV activities was noted across programs as impairing country ownership of programs.

C. Supervision

Supervisory practices differed across all areas included in the assessments, involving different actors—CSB doctors; NGO technical assistants (TAs, limited to SN2 supported areas); SDC members; the medical inspector; and, occasionally, SN2 program managers—to jointly or separately supervise CHVs. A respondent in Atsinanana noted that individuals regularly leave these positions, while a CHV in Androy noted continuity among the TAs. These actors and CHVs attend monthly review meetings organized at the commune level (by the chief of the health center or post). The distances they must travel to attend these meeting are often considerable, as 78.5% of c-IMCI CHVs and 77.8% of RH/FP CHVs who participated in the cross-sectional study reported living between five and 20 kilometers from the nearest health facility.

As all CHVs come to these meetings at the same time, they face long waiting times, for which they request a subsistence allowance. They receive allowances for their travel costs only for the biannual performance appraisal, not for routine supervision, such as the review meetings. Supervisors receive compensation (travel and per diem) when they travel to make a supervisory visit.

1. SN2 supervisory practices

SN2 introduced a strategy in 2009 for CHV supervision to improve the quality of CHV performance and services. The strategy promotes supervision to be organized at the commune level.

SN2 supervision guidelines call for supportive supervision, defined as "the art of supporting the other person, allowing him/her to make use of his/her best competencies, while observing norms and standards of practice" (USAID Madagascar, 2009). SN2 distinguishes supportive supervision from routine supervision by adding three practices to the former: the observation of CHV practice, an evaluation of such practice, and the immediate strengthening of competencies. The supervisor's task is to guide, help, train, and encourage the CHV after a formal evaluation of his/her competencies and skills, using the supervision tools (USAID Madagascar, 2009). The supervision guide recommends: 1) good preparation, including announcing the supervision visit, reviewing CHV service provision data, and readying the observation exercises; 2) creating a positive atmosphere of trust through encouragement and explanation of the supervision objectives; and 3) finding solutions for technical and logistical challenges.

Each performance evaluation has five parts, presented in five sections in checklists for each type of CHV:

- General information (provided by the NGO) on the CHV.

- CHV functionality: Does the CHV have all the materials and equipment necessary for the tasks? How well does he/she use the management tools to report activities?

- Performance: The CHV's technical competencies are verified through observations of his/her work or simulation exercises.

- The CHV's knowledge of management tools, the referral system and documentation, and attitudes toward and behavior with patients.

- A supervisor-provided summary report on the observations, measures discussed, and recommendations for follow-up.

Competencies are evaluated according to a scoring system allowing the supervisor to monitor each CHV's knowledge and skills over time. A score above 70% is considered satisfactory (level A), 50–70% as sufficient but requiring follow-up (level B), and below 50% as insufficient and requiring training and close follow-up (level C). In SN2's annual report from October 2011 – September 2012, it was reported that with respect to end-of-training performance 63% of CHVs were in level A, 30% were in level B, and 7% were in level C (RTI International, 2012).

Evaluation is usually done by a CSB doctor at least semi-annually. An individual's supervision report is shared with the TA and shared with the health center. SN2 gives the local supervisor a financial incentive upon timely delivery of a completed report. SDC members monitor awareness-raising, demand generation, and stimulation activities through on-site visits with the CHVs.

SN2's concept of supportive supervision includes an individual performance evaluation. A monthly review is conducted by members of the SDC, local supervisors, and the CHVs to identify problems or gaps in services. Every three months, the CHVs receive supervision consisting of an evaluation of their competencies and support to strengthen these competencies. Continual monitoring is conducted by local supervisors. Calling it "supervision" may be one reason why the functionality scoring for individual performance appraisal does not reflect the existence of a performance evaluation practice.

2. Supervisory Practices and Processes in UNICEF-supported Regions

UNICEF supports the use of government tools and processes in managing CHVs in Madagascar. Throughout this assessment, FGDs and interviews found broadly consistent perceptions in key aspects of supervision. All participants had a common understanding of the approach of supervision: They saw it as useful to ensure and improve the quality of service delivery through a combination of quality control, capacity building, and providing support to CHVs in problem solving.

In general, supervision was applied in groups at the commune level, mostly during monthly review meetings and involving community representatives and sometimes TAs and the CSB supervisor-doctor. The detailed (semi-annual) evaluation was done using the SN2-developed evaluation forms (for the SN2 supported activities). FGD and interview participants confirmed that supervisory visits at CHV sites were rare. In FY 2012, SN2 reported that 3,001 CHV health huts were constructed by participating communities (RTI International, 2012).

3. Synthesized Findings

Across Analamanga, Atsinanana, and the SN2 program in Androy, supervision was scored as functional as there were few supervisory visits to the field. Among UNICEF-supported CHV activities in Androy, this component was rated non-functional; participants expressed frustration with the lack of both supervision and evaluation. During a validation visit, one CHV reported seeing his supervisor less than twice a year.

CHVs and their supervisors had a common **understanding of supervision**. During the FGDs, both CHVs and supervisors expressed that the aim of supervision is to ensure quality of CHV services. CHVs were appreciative to supervisors for the support and guidance offered, especially in the realm of

identifying solutions to challenges and encouraging good performance, which supervisors viewed as central tasks. Across the three regions included in the qualitative assessment, supervisors felt they were responsible for clarifying the roles and responsibilities of the CHVs and building relationships between CHVs and the community. Supervisors in Analamanga saw themselves as mediators, particularly in instances where the community had expectations of the CHV that were beyond their defined role.

With respect to the **frequency** of supervisory visits, 69% of c-IMCI and 75% of RH/FP CHVs participating in the cross-sectional study reported they had received a technical supervision visit within the quarter prior to data collection, though it was also shared that these visits were not done with any regularity. Data from the cross-sectional study also indicate that less frequent supervision (between one and five visits in the 12 months preceding data collection) was associated with poorer performance among c-IMCI CHVs. In the qualitative assessment, CHVs shared that communes conducted review meetings with CHVs on a monthly basis. However, it was noted that participation of SN2 representatives in these meetings in Analamanga had decreased from monthly to quarterly and the frequency of SBC doctor-supervisors visits had decreased from quarterly to biannually. SN2's reduction in participation in supervision has been attributed by assessment workshop participants in Analamanga to the phasing out of the program and budgetary limitations. CHVs participating in the FGDs expressed a desire for more frequent supervisory visits, with sufficient time allocated for observation, feedback, and guidance. Those in a supervisory role who participated in FGDs on the topic felt that conducting home visits was a notable challenge due to distance, lack of transportation, and, in one case, physical limitations due to age. These supervisors felt that their inability to visit CHVs in their communities impacted their relationships with CHVs. CHVs, supervisors, and community representatives participating in FGDs all recommended increasing supervision visits and ensuring supervisors had the means and support to make these visits. However, it should be noted that in SN2's most recent annual report it was stated that there had been an increase in supervision visits by both SDC members and implementing NGO technical staff in FY12 compared to FY11. In FY11 91% of CHVs received supervision visits, while in FY12, 100% had received visits. The report indicates that this was in part due to enhanced support offered by the NGOs' TAs to the SDCs in "organizing routine monitoring of CHVs" (RTI International, 2012).

According to participants from the qualitative assessment, the **tools** used during supervision and evaluation visits were developed by SN2. Supervisors broadly viewed these forms as useful, but did have some suggestions for improvement, including aligning the content with other reporting requirements and translating them into Malagasy. Supervisors from Analamanga viewed the tools as a useful guide during the evaluation. However, supervisors from Atsinanana and Androy expressed that the forms were complicated and time-consuming. Comments specific to the tools included that the forms included redundancies and that verification of self-reported information by CHVs was not possible since site visits were not performed. Supervisors in Androy noted that these forms presented significant burden, stating that completion time averaged 60 minutes.

Community involvement in the supervision and evaluation of CHVs was predominantly through SDC member participation in review meetings, along with CSB supervisors and CHVs. These SDC members had influence within the broader community and therefore were able to facilitate and mediate between CHVs and the community. They aided in raising awareness among community members on the role of CHVs and the services they provided. With respect to supervision, SDC members did not provide any technical oversight to the CHVs, but rather monitored CHV activities and the implementation of recommendations made to CHVs during review meetings.

4.   CHV Performance

The cross-sectional assessment analyzed the performance of c-IMCI CHVs and FP/RH CHVs. The key findings are summarized here and are explained in detail in the full report (Agarwal et al., 2013). No

significant differences in performance were found between CHVs in SN2-supported areas and CHVs that were trained by UNICEF and supported by the MOH.

c-IMCI CHVs

Table 3 describes the proportion of children classified correctly by CHVs compared to a gold-standard evaluator. Performance varied across different classifications. The best performance in correct classification by CHVs was seen in identifying nutritional status (83%) and the poorest performance in severe febrile illness (26%).

Table 3: Proportion of children classified correctly by CHVs (n=745)

Classification	Number classified by gold standard	% Classified correctly by CHVs	95% CI
Severe diarrhea	23	41%	15–68
Uncomplicated diarrhea	145	55%	44–66
Severe respiratory illness	3	43%	18–68
Uncomplicated pneumonia	101	39%	26–51
Severe febrile illness	6	26%	0–82
Uncomplicated malaria	31	67%	47–86
Illness with danger signs	160	73%	65–82
Nutrition status	745	83%	78–89
Severe malnutrition	31	68%	44–92

Proportion of children correctly treated by CHVs varied from 42% (cough) to 78% (severe malnutrition), as seen in Table 4.

Table 4: Proportion of children treated correctly for IMCI illnesses

Classification	Number treated by gold standard	% treated correctly by CHVs	95% CI
Severe diarrhea	23	74%	(50.2, 97.0)
Uncomplicated diarrhea	145	44%	(32.1, 56.8)
Severe respiratory illness	27	69%	(47.3, 91.2)
Uncomplicated pneumonia	101	50%	(36.2, 65.8)
Cough	288	42%	(32.3, 52.7)
Severe febrile illness	13	61%	(30.4, 92.0)
Uncomplicated malaria	30	60%	(36.7, 84.3)
Other febrile illness	177	53%	(42.9, 65.2)
Illness requiring referral[a]	252	68%	(60.0, 76.5)
Severe malnutrition	31	78%	(59.8, 98.2)
Illness requiring life-saving treatment on-site[b]	256	53%	(43.6, 63.1)

[a]Illnesses that required referral included severe malnutrition, severe diarrhea, severe febrile illness, severe respiratory illness, presence of any danger signs, disease identification other than fever, respiratory illness, or diarrhea. [b]Community-IMCI-treatable illness requiring life-saving treatment on-site: uncomplicated diarrhea, pneumonia, and/or fever.

A performance score representing the proportion of tasks correctly undertaken was computed for each observed c-IMCI clinical encounter. Table 5 summarizes the performance scores across 622 ill child assessments. The mean performance score was 75% (95% CI: 72,78).

Table 5: Performance scores for c-IMCI CHVs (n=622 encounters)

Statistic	Value	95% CI
Number of ill child assessments[a]	622	NA
Mean performance score	75.1%	(72.3, 77.8)
Median performance score	79%	NA
Range of performance scores	6.25%–100%	NA

[a]Excludes children with chief complaints of non-c-IMCI diagnoses (for example, skin rash).

Figure 7 shows the distribution of overall performance scores amongst c-IMCI CHVs. CHVs performed best in identifying the main complaint and related symptoms, with lower performance in the correct classification of diseases and selecting the appropriate treatment (Agarwal et al., 2013).

Figure 7: Performance score distribution among c-IMCI CHVs (n=149)
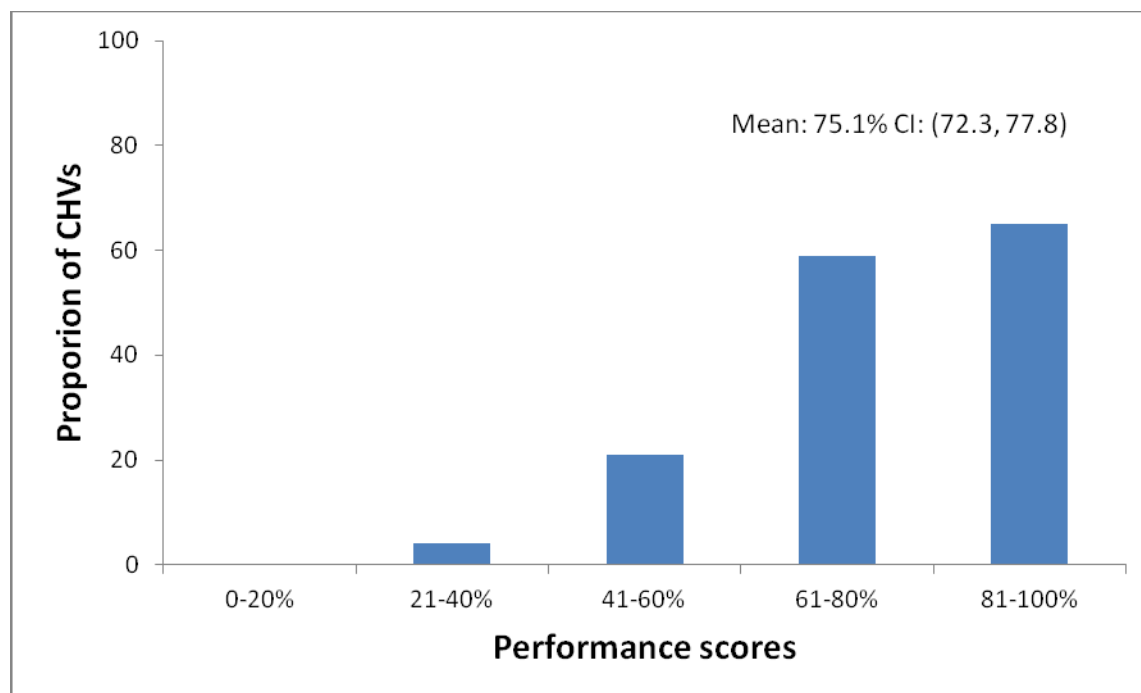
Factors found to be associated with better CHV performance (scored from 0 – 1) were identified through multivariable linear regression and included: a higher score on the knowledge assessment (β 0.03), greater years of education (β 0.01), and higher number of perceived responsibilities (β 0.015). The magnitude of these associations was small. Distance between the CHV and the CSB of greater than 20km (β -0.08), receiving less than six supervision visits in the past 12 months (β -0.08), and evaluating cases of respiratory complaints (β -0.06) and diarrhea (β -0.05) were associated with lower performance scores.

RH/FP CHVs

Performance was assessed across five encounters observed for each of the 100 RH/FP CHVs. The CHVs were found to assist the client to express her needs in 78% of observed encounters and encouraged the client or couple to make an informed choice in 89% of encounters. Eligibility was correctly classified for 91% of encounters for oral contraception and in 95% of encounters for injectable contraceptives. The mean performance score representing the proportion of tasks correctly completed was 73.9 (95% CI: 70.3, 77.6) with a range from 40.7 to 100. Important performance gaps were identified in the assessment, with standard checklists found to be used in only 69% of client encounters and contraindications assessed for oral contraceptive use in only 41% of encounters where women expressed interest in oral contraceptives. The distribution of performance scores amongst RH/FP CHVs is shown in Figure 8 below.

Figure 8: Comprehensive performance score distribution among RH/FP CHVs (n=100)
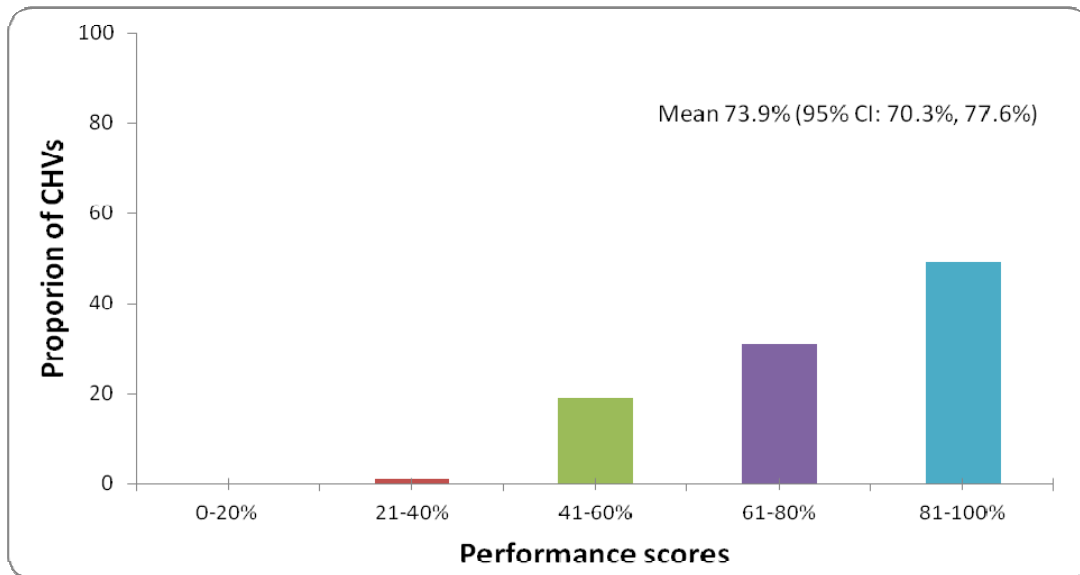
Multivariate linear regression identified three variables associated with better performance scores (scored from 0 – 100): greater number of years of education completed (β 1.8), greater number of hours worked as a CHV per week (β 0.3), and receiving refresher training after initial FP training (β 13.2).

IV. DISCUSSION

A. Program Functionality

Findings from the cross-sectional study support the view that recruitment, initial training, and opportunities for advancement are strengths of the assessed CHV programs. While findings from the qualitative assessment indicated that community involvement was a strength of CHV programs (Table 6), the cross-sectional study found that CHVs viewed community involvement and respect from the community as one of their greatest challenges; specific reasons for why this presented a challenge were not captured by either assessment. Reports from program supervision reveal that CHV services are underutilized in some communities, and an official recognition ceremony to acknowledge their role can be useful to establish credibility in their communities (personal communication, Alyssa Finlay-Vickers, CDC). While specific questions on documentation and information management were not asked in the cross-sectional study, sharing of documentation with the community did occur.

Table 6: CHW AIM functionality scores, Three SN2 regions

	Component	Analamanga (1 NGO)	Atsinanana (4 NGOs)	Androy (2 NGOs)
1	Recruitment	3	3	3
2	CHV role	2	3	2
3	Initial training	2	3/3/2/2	3
4	Continuing training	2	3	2
5	Equipment and supplies	1	3/3/3/2	1
6	Supervision	2	3	2
7	Individual performance evaluation	2	3/3/2/1	1
8	Incentives	2	2	2
9	Community involvement	3	3	2
10	Referral system	2	3	2
11	Opportunity for advancement	3	3	2
12	Documentation & information	3	3	2
13	Linkages to health systems	2	2	2
14	Program performance evaluation	3	3	1
15	Country ownership	2	2	1
	Total	34	39/39/39/41	28

Legend: 0 (not shown) = non-functional; 1 (orange) = partially functional; 2 (pink) = functional; 3 (green) = best practice; white = mixed results.

Data from both the qualitative and cross-sectional studies found that while all CHVs received initial training, ongoing training presented a challenge. Ongoing training has been shown to improve RH/FP CHV performance scoring by 13.2 points. A literature review of CHW programs found that both initial and ongoing training are essential for the success of CHW programs (Shakir, 2010).

Incentives are an important aspect of CHW programs, though not all incentives need to be financial. The findings from the cross-sectional study that being in service to and receiving appreciation from the community was a motivating factor for CHVs is consistent with other studies (Jerome and Ivers, 2010, Robinson and Larsen, 1990). While the most recent SN2 annual report indicates that the community supported CHVs through activities like constructing health huts (RTI International, 2012), the practice is not universal, and both assessments found that community support of CHVs could be improved.

Across both assessments, the availability of equipment and supplies was weak. The frequency and duration of stock-outs was noted by CHW AIM participants and CHVs in the cross-sectional study. This may possibly be due to stock-outs at the central and commune level and may also be due to limited ongoing training and supportive supervision in managing inventory and supply orders. Insufficient or inappropriate supplies have an impact on the quality of services CHWs provide (Gilroy et al., 2012, Stekelenburg et al., 2003). Data from a three-country study in Africa on supply chain management for community case management of childhood illnesses found that knowledge among CHWs and their

supervisors of "how, where, what, when and how much of each product to requisition or resupply" is a precondition to reducing stock-outs among CHWs (Chandani et al., 2012).

The referral system was also weak, as only approximately half of CHVs reported making referrals. The cross-sectional survey collected information from individual CHVs only and did not assess systems-level areas such as country ownership, but the qualitative assessment did find that the lack of national level budget to support CHV programs impairs the country's ability to take full ownership over the program. The weak linkages with the formal health system and country ownership over the assessed CHV activities need to be understood within the current political context in which USAID is restricted from providing financial, material, or technical support or assistance to the Government of Madagascar, including the MOPH, following the 2009 *coup d'état*.

B. Supervision Practices and Tools

There was general understanding of the purpose of supervision among participants of the qualitative assessment. Respondents across both assessments expressed the need for more direct technical supervision, specifically supervisory visits to the CHVs. That supervisors across programs were not provided with the means to visit CHVs in their place of work indicates a weakness in program functionality. While logistically challenging to implement at scale, well-structured supportive supervision practices can positively influence CHW motivation and offer opportunities for capacity building and professional development (Haines et al., 2007).

Performance evaluation was noted as a weakness in the qualitative assessment and is supported with evidence from the cross-sectional study in which only half of the CHVs reported receiving a performance evaluation. Receiving fewer supervisory visits was associated with poorer performance among c-IMCI CHVs.

C. Limitations

There are many limitations of this synthesis, compounded by those of the individual assessments. In this section, the limitations of each assessment – qualitative, quantitative, and synthesis – are presented.

1. Qualitative assessment

The Madagascar assessment was the first application of the CHW AIM tool in French. Components were also translated into Malagasy. As a result, there was a loss of linguistic accuracy. In one region, Androy, there had been several organizations supporting CHVs throughout the years prior to this assessment. This made it difficult in locating MOPH/UNICEF-trained CHV participants with experience only with UNICEF-supported programs. CHVs' previous work with other organizations may have influenced their views on the program included in the qualitative assessment. Workshop sessions, interviews, and group discussions were not audio-recorded, which may have resulted in missing or inaccurate data. Additional meaning may have been lost as several people were involved in collecting, documenting, translating, analyzing, and reporting data. Finally, the "country ownership" element of functionality, as defined by the CHW AIM, presented a challenge given the current political situation in Madagascar. Scoring this element as best practice or functional for either assessed program was impossible, which impacted their overall functionality score.

2. Cross-sectional Study

Some of the limitations outlined in the cross-sectional study referred to the component addressing CHV performance. One limitation, with respect to sampling, was making 20 substitutions of CHVs as those initially selected were not available, which may have introduced a selection bias as they were not selected through probability sampling. This effect is likely to be small given that the district and communes were selected by probability sampling, and the substitutions came from the same sampled geographical area.

3. Synthesis

The synthesis was performed by a member of the HCI Research and Evaluation team who had no involvement in the data collection for either assessment and minimal involvement in the production of the quantitative report, but who was involved in the review and refinement of the qualitative report. The integrative approach used in this synthesis employed the functionality components as defined by the CHW AIM and used in the qualitative and cross-sectional studies, which may have limited the depth of analysis allowed. Given that primary data were not available to the lead author, the synthesis was performed using the previously analyzed data which also may have impacted the richness and complexity of the analysis. However, the synthesis report was reviewed by primary authors of the qualitative and cross-sectional study reports and key stakeholders in Madagascar, which may have mitigated some of these limitations.

V.   CONCLUSION AND RECOMMENDATIONS

Based on the findings from this synthesis report, in conjunction with the recommendations presented in the qualitative and cross-sectional study individually, the following recommendations for improving the functionality of CHV programs in Madagascar are presented. Overall, the recommendations in this synthesis reflect those offered by the two assessments individually and complemented by project data and other sources. However, more depth is provided when examining findings across the two assessments.

Linkages with the community should be strengthened, including clarifying roles. One means of achieving this may be involving the community in CHV trainings to raise their awareness of CHV roles and responsibilities. Involving local leaders, such as village chiefs, in trainings and public events such as the opening of a new CHV site, can be a means of building awareness of and support for CHVs and the services they provide. Supporting the SDCs to be champions within the community and broker relationships between CHVs and the community can enhance CHVs' legitimacy within the community and provide an alternative source of support to CHVs. Additionally, encouraging CHVs to conduct an assessment of the health needs within the community can both introduce the CHV to the community and engage the community in improving their own health.

Ongoing trainings should be conducted to build skills among CHVs, not only around service delivery, but also the **management of supplies** and effective ordering procedures as a mechanism for reducing the number and duration of stock-outs. However, there are other factors affecting the supply chain such as the presence of supplies in central stores or mechanisms for transporting supplies to CHVs which should be optimized. Population Services International (PSI)/Madagascar had identified several challenges in supply chain management: product insufficient storage conditions at the CHV level; insufficient promotion and advertising around product CHVs distribute; inadequate income generation for CHVs through selling products which forces them to maintain other employment thereby limiting community access to their services; poor communication between PSI distribution teams, community-based supply points, and CHVs; and stock-outs at the central level. Activities to improve these areas should be implemented and evaluated. Lessons may also be gleaned from experiences in other countries.

Linkages with the formal health system, at all levels should be strengthened. Notably, linkages with respect to the referral system should be improved. Training and encouraging CHVs to refer clients in need of services to the health system should be conducted. Providers within the health system should also be trained to provide counter-referrals to ensure continuity of care and follow-up for their clients. Other forms of more direct communication could also be developed and supported to enhance the links between CHVs and health facilities. However, building the linkages with the formal health system is challenged by the current political situation in which USAID is prohibited from working directly with the MOPH.

Supportive supervision, especially visits to CHVs, should be integrated into the program and their budgets to ensure that CHVs are getting the necessary guidance to improve the technical quality of services they deliver. Supervision of c-IMCI CHVs should emphasize correct classification and treatment of children with c-IMCI-treatable illnesses. Deliberate and well-thought out approaches for providing supervision to those CHVs living and working farther away from health facilities should also be explored, such as providing support and supervision via mobile technology. Prior to implementing any new approaches to supervision, there should be careful consideration of both the financial and opportunity costs to ensure sufficient resources and that CSB staff will not be taken away from their service delivery responsibilities at the facility. In spite of SDC members not having knowledge to provide technical supervision to CHVs, they may be able to reinforce or otherwise support the messages delivered by the CSB staff who offer technical supervision if linkages between the SDC members, the formal health system, and CHVs are strengthened. Competency of CHVs can be monitored by assessing knowledge and conducting observation.

Establishing a **national monitoring and evaluation system** is also recommended as a means of informing programmatic decisions and monitoring performance. Such data aid in identifying gaps in services and improving quality.

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