DIGNITAS

Sioux Lookout
First Nations
Health Authority

Best Practices in Implementing Community Health Worker Programs:
Case Studies from Around the Globe – A Programmatic Report

Dignitas International & Sioux Lookout First Nation Health Authority
May 2016

ACKNOWLEDGEMENTS

This report was prepared for Dignitas International and the Sioux Lookout First Nation Health Authority by: Cassandra Vujovich-Dunn, Knowledge Translation and Exchange Fellow.

Key contributions from the following individuals are also recognized:
Ben Chan
Terri Farrell
Janet Gordon
Kelly Henderson
Emmay Mah
Stephen Pomedli
Mariette Sutherland
Sumeet Sodhi
Joseph Zulu

We thank the programs in Alaska, Brazil, Ethiopia, Malawi, Minnesota, Pakistan and Zambia who graciously hosted our project team members and support our observation of their work.

This work was made possible through the generous support of the Ministry of Health and Long-Term Care.

EXECUTIVE SUMMARY

The term “community health worker” (CHW), is an umbrella term that covers a wide range of health workers. These include paid and unpaid, professional and lay, those who have experience working in health and those who do not. They can be people of any gender, young or old. Regardless of other factors, CHWs almost always come from the communities they work in. Deployment of CHW programs has been widespread in order to fill gaps in existing health services, often through task-shifting of roles and responsibilities from other health providers to CHWs.

CHWs perform roles that are related to health care delivery. The wide range of services offered by CHWs to communities can include public health and primary care tasks. Broadly, CHW tasks can encompass health promotion, screening, diagnosis and treatment, as well as the collection of basic health information. Most important, CHWs are able to respond to the local social and cultural norms of the communities they work in to promote community acceptance and ownership.

CHW programs have been successfully implemented around the world. CHWs play an important role in health service delivery for many countries, at local and regional levels.

The purpose of this programmatic report is to identify key determinants of success of a CHW program through in-depth case studies in various global health implementation contexts. This report outlines best practices in implementing a CHW program as identified through a literature review and site visits of CHW models in Malawi, Ethiopia, Zambia, Alaska, Minnesota, Brazil and Pakistan.

Figure 1: Expert Clients in Malawi assist a mother and child during a clinic visit.

ABBREVIATIONS

ART	Antiretroviral Treatment
AIDS	Acquired Immune Deficiency Syndrome
CDA	Community Development Assistant
CHA	Community Health Agent
CHA	Community Health Aide
CHA	Community Health Assistant
CHAP	Community Health Agent Program
CHAP	Community Health Aide Program
CHP	Community Health Practitioners
CHP	Community Health Promoters
CHW	Community health worker
DOTS	Directly Observed Treatment, Short-course
FP	Family planning
FQHC	Federally-Qualified Health Centres
HAART	Highly Active Antiretroviral Treatment
HEDIS	Healthcare Effectiveness Data and Information Systems
HAD	Health Development Army
HEP	Health Extension Program
HEW	Health Extension Workers
HSD	Health Sector Development
HIV	Human Immunodeficiency Virus
HAS	Health Surveillance Assistants
LHW	Lady Health Worker
LHWP	Lady Health Worker Program
LHW	Lay Health Worker
MCDMCH	Ministry for Community Development, Mother, and Child Health
MDGs	Millennium Development Goals
MOH	Ministry Of Health
NCD	Non-Communicable Disease
NGO	Nongovernmental Organization
PMTCT	Prevention of Mother to Child Transmission
PHC	Primary Health Centre (PHC)
PSF	Programa Saúde da Família
STI	Sexually Transmitted Infection
TB	Tuberculosis
WHO	World Health Organization

INTRODUCTION

The term “CHW” covers a wide range of lay health workers that perform a varied scope of services including public health and primary care tasks. CHWs primarily come for the communities they serve. This enables CHWs to respond to the social and cultural norms that can affect health services, as well as health seeking behaviors of community members. The purpose of the programmatic report is to identify key determinants of success of a CHW program through in-depth case studies in various global health implementation contexts.

METHODOLOGY

This programmatic report outlines the best practices in implementing a CHW program as identified through a literature review and site visits of CHW programs in Malawi, Ethiopia, Zambia, Alaska, Minnesota, Brazil and Pakistan. The site visits consisted of observations and detailed field notes. A desk review was conducted on the respective countries which included both published peer-reviewed articles and grey literature from various sources to triangulate data collected during site visits.

CHW HISTORICAL CONTEXT

During the 1980s, with the Alma Ata Declaration, CHWs, were projected to become the cornerstone of primary health care, although by the 1990s their importance had significantly declined in favour of alternative vertical programming.[1] The emerging interest in integrated primary care resulted in a remerging interest in the importance of CHWs in the early 2000s.[1-3] CHW programs have been extensively deployed in many low resource settings to address shortages of highly trained health care workers through task-shifting, increasing access to care, improving health outcomes, and complementing traditional healthcare delivery systems.[4,5]

Various models have been successfully adapted across different cultures, locales, and communities to address the spectrum of health needs. Within these models, the roles, the services and the typology of the CHW is varied.[1] Rural, underserviced areas in Thailand, Bangladesh, Pakistan, Ethiopia, and Tanzania have been using CHWs to address acute infectious illnesses, including respiratory infections, malaria, tuberculosis (TB), and HIV/AIDS.[1,6] After brief training programs, these health workers competently provide disease-specific education to mothers, as well as initial assessments, antibiotic therapy and triage to higher-intensity medical centres as needed. The outcomes are substantial: meta-analyses of such programs for respiratory illnesses demonstrate that CHW programs reduced disease-specific mortality by 24%,[7] while malaria detection and treatments efforts decreased deaths from malaria by up to 40%.[8]

Aware of these successes, India, Kenya, Uganda, Rwanda, and South Africa have begun to explore opportunities for national strategies for the integration of CHWs within

existing health services.[5,9,10] Cambodia has recently scaled-up its rural CHW program, expanding the program by over 2,000 workers.[11] The wide range of services offered by CHWs to communities can encompass counseling on breastfeeding, management of childhood illnesses, rehabilitation support for community members suffering from mental health issues, and other activities including health promotion, screening, diagnosis and treatment. Their tasks can also include increasing uptake of infant immunizations,[13] monitoring neonatal growth and adequate child nutrition (Bangladesh, Mexico), providing easy access to injectable contraceptives (Bolivia, Guatemala, and Nepal), emergency contraception (Pakistan and India) and palliative care services (Rwanda).[11,14,15] Meta-analyses have shown dramatic improvements of up to 50% in the uptake of both adult and childhood immunizations in communities with CHW programs,[13] as well as a two- to three-fold increase in uptake of breastfeeding and cancer screening services.[5]

Given the variety in typology and role of CHWs, issues facing policymakers and program managers are essentially the same as those from 1980s, namely how to make decisions around the design, the management of program, and in particular how to ensure the program functions effectively. Considerations include how to select, train, retain, supervise and support CHWs in community settings.[16] In addition, monitoring and evaluating the performance of CHWs is an important element of quality assurance, which is essential to creating programs that are effective, resilient and efficient.[16] Lastly, much of the literature on health equity suggests that a key to addressing poorer health in certain populations is outreach activities where individuals from the community can speak to and influence the community, which is a high priority for CHW programs.[17] From this perspective, CHWs have the potential to address health disparities distinct from what individuals from outside the community can do.

CASE STUDY FRAMEWORK

In 2010, the Global Health Workforce Alliance (the Alliance), which is a partnership between the World Health Organization (WHO),national governments, civil society, international agencies as well as researchers and educators, who joined together to implement solutions to the health workforce crisis.[1] A global systematic review, conducted by the Alliance, was undertaken to identify CHW programs with a positive impact on the Millennium Development Goals (MDGs) that are related to health namely MDG4 and MDG 5.[1] It also included case studies for 8 countries in Sub-Saharan Africa, South East Asia and Latin America. However, the systematic review determined that disease specific studies, particularly those that related to the role of CHWs in prevention, mental health, food security and nutrition were scarce. The case studies incorporated in the systematic review had a specific focus on the typology of CHWs, their selection, training and supervision, standards for evaluation, performance and impact assessment.[1] There were several limitations to the studies included in the systematic review. By and large, it was difficult to ascertain the level of education of a CHW upon hire, the level and amount of supervision provided to the CHW and the provision of training.[1] The systematic review found that community ownership and supervision of CHWs were key characteristics, which were not sufficiently identified or

analyzed, in the available literature.[1] Lastly, the Alliance, recommended future research on programs that are integrated into broader health systems, rather than siloed vertical programming that is currently taking place.

Drawing on the findings of the systematic review for our case study selection, we included programs in Minnesota, Alaska, Brazil, Ethiopia Zambia, as these programs are coherently incorporated into a wider health system, with CHWs included as part of the human resources strategic planning, as well as Malawi, who's CHW programs were disease specific, including Mothers2Mothers, who are primarily centered on prevention of Mother to Child Transmission (PMCT) of HIV, and Dignitas' HIV+ Expert Patient program.[1]

Upon an extensive literature review including both published peer-reviewed articles, and grey literature from various sources, we developed a case study framework to analyze the global case studies in order to identify best practices. The case study framework was developed based on anticipated knowledge user needs, and was refined and updated following the literature review. The framework was formulated to address existing gaps in the current CHW literature around pragmatic needs for implementation information and evidence. The case study framework consisted of the following 11 sections to assess the CHW programs.

1. Program Descriptions
2. Team Structure
3. Accountability
4. Recruitment/Retention
5. Remuneration
6. Standard Processes
7. Training
8. Supervision and Skills Verification
9. Quality Measurement
10. Policy Environment
11. Sociocultural Context

CASE STUDY COUNTRIES

Malawi

Background

Figure 2: An Expert Client counsels an elderly patient.

Malawi has a long historical use of CHWs, dating back to the 1950s, when Health Surveillance Assistants (HSAs) were recruited by the Ministry of Health (MoH) to provide immunizations.[16] The HSAs played a prominent role in eradicating small pox in the 1960s-1970s, and were part of the frontline health workers managing the cholera epidemics in the 1970s-1980s.[16] Today, through support from the Global Fund for HIV, TB and Malaria, the government was able to expand the workforce to 10,000 HSAs.[16] That being said, there are other cadres of CHWs working in Malawi, including Dignitas International's HIV+ Expert Client program, which incentivizes individuals who are HIV positive and have openly declared their status to work at Health Centres where they provide counseling, and support for those who are newly diagnosed with HIV. Expert Clients inspire others to seek testing and treatment, as well as facilitate HIV support groups, and assist with clinical tasks including measuring vital signs, recording weights, and filing patient records. Another CHW program in Malawi is Mother2Mothers, which is the program of primary focus for this report.

Health Needs

Malawi has suffered greatly from the HIV and AIDS epidemic. According to the latest UN AIDS country report, there are approximately 1,100,000 Malawians living with HIV, which translates into more than 1 in 10 adults being infected.[17] In 2014, there were approximately 33,000 deaths due to AIDS and over 130,000 children aged 0-14 living with HIV.[17] Malawi has high rates of other communicable diseases, including TB, and rising rates of non-communicable disease (NCDs) co-morbidity, in particular hypertension. The health needs of the country are further complicated due to the high levels of poverty throughout the nation. Three-quarters of Malawians live below the international poverty line. As a result of endemic poverty and the many threats to health, the average life expectancy is only 47 years of age.[19] According to the WHO, there is one primary physician for every 50,000 Malawians.[19]

Program

The Mothers2Mothers (m2m), model was designed to improve PMTCT outcomes. The model is delivered in health care facilities. It identifies and employs women, who are mothers, HIV positive and have already gone through the PMTCT program as clients. The training offered to Mentor Mothers is developed and delivered by the m2m organization. They receive training in basic HIV/AIDS information, PMTCT services, disclosure of status, breast-feeding, antiretroviral treatment (ART), safe sex and family planning as well as nutrition and other lifestyle topics, including how to relay their experiences in an informative way for other women. In Malawi, 174 Mentor Mothers are

working at 101 sites. M2m continues to expand their model throughout the region. The model is cost-effective, and easy to replicate as evidence of its expansion to several countries including, Kenya, South Africa and Swaziland, where it has become part of the national program, as well as, Lesotho, and Zambia.

Key Concepts
One of the biggest strengths of this model is the Mentor Mothers themselves, essentially the expert client. These women become fully integrated members of the PMTCT care team. Their status and connection to the community enables them to be the most effective peer mentors, and they also stand as an example to community of the sort of life a woman can live after HIV diagnosis. This program, through expert clients, highlights the importance, and feasibility of peer-based models in connecting with specific communities to ensure a successful intervention.[1]

Ethiopia


Figure 3: A HEW visits a family in rural Ethiopia.

Background
There is a long tradition of CHWs in Ethiopia. Following the Alma Ata Conference, several thousands of CHWs were trained in the 1970s -1980s.[20] In 1998, the National Health Sector Development Program (HSDP), was launched which shifted the focus of the health system from curative medicine to prevention and health promotion, with a main prioritization of the health needs of the rural population, which accounts for 83% of the total Ethiopian population.[20] A review after the first 5 years of the HSDP found that challenges achieving universal primary health care coverage remained.[21] In 2003 the government launched the Health Extension Program (HEP), to address national primary health care.[22] The current national cadre of CHWs, fall under this program and are called Health Extension Workers (HEWs). The first group of HEWs were trained in 2004–2005.[23] Currently, there are 34,000 HEWs working out of 15,000 health posts around the country.

Health Needs
Ethiopia suffers from a range of complex health needs. There is s large burden of infectious disease, malnutrition and maternal/neonatal conditions.[20] Approximately 470 Ethiopian women die per 100,000 live births, those that survive have very low prenatal and postnatal service utilization, resulting in higher mortality.[20] The leading causes of maternal mortality are obstructed or prolonged labor, pre-eclampsia or eclampsia and malaria.[20] Ethiopia is one of the top 5 countries in sub-Saharan Africa with the highest prevalence of malaria.[20] In terms of communicable disease, HIV and TB remain

prominent issues. [20] The prevalence of HIV nationally in 2003 was 2.3% of the population.[20] The leading causes of death for children under the age of 5 are pneumonia, diarrhea, malaria, neonatal problems, malnutrition, and HIV/AIDS.[20] Lastly, environmental health plays a critical role in the transmissions of diseases in Ethiopia, with over 38% of Ethiopian households reporting a lack of toilet facilities.[20]

Programs

The HEW model was based off of an agriculture extension worker program. Ethiopia is currently training about 30,000 HEWs for deployment.[1] HEWs training and tasks have a strong emphasis on maternal and child health, HIV and malaria.[1,24] That being said, HEWs can provide a range of services, including prevention and promotion, education, outreach support for health services at the primary health clinics, as well as offer case-management support at the community level in particular to assist community members with chronic illness (e.g., HIV), provide immunizations, family planning (FP) services, and basic first aid.[20] The HEW program also contains other voluntary CHWs, including Community Health Promoters (CHPs), now called Health Development Army (HDA) volunteers.[20] HEWs train and oversee the HDAs in the community.[20] HDAs receive 96 hours of training on household food and water sanitation, family planning, exclusive breastfeeding, when to start and finish immunizations, latrine construction and utilization, transmission and prevention of communicable disease like HIV and TB. The role of the HDAs was conceptualized to increase the utilization of primary health care services within their communities, with the HDAs working less than 2 hours per week.[20] They are model community members, along with their families, they are expected to share health information with the rest of the community.[20] There are 2 female HEWs that serve a *Kebele,* a community of about 5,000 people. HEWs spend 50% of their time at the health post, and 50% of the time in the community. The HEWs focus on mothers and children under 5, with the expectation that individuals outside those demographics will travel to the primary health centre.

Key Concepts

One of the most unique features of the Ethiopian program is their “model family.” In each community persons are selected to play the role of the model family, with one model family per 5 households. The model family mentors each cell, which is about 40 people, with the model family leaders gathering once a week to discuss issues in the community and troubleshoot. The model families act as an extension of the HEW expanding the reach of HEWs in the community.

In addition, the HEWs have standardized accountabilities that include 16 tasks; latrines (hygiene education), personal hygiene, water sanitation, nutrition, household sanitation, control of insects, care of mother and child, FP, sexual and reproductive health, immunization, nutritional interventions for children and mothers, HIV/AIDS prevention, prevention and control of TB, prevention and control of malaria, first aid and treatment. This CHW model has helped Ethiopia achieve MDG4; reduce child mortality, ahead of its target.

Finally, the government formally recognizes HEWs as a health cadre. This strong political support of the role ensured that HEWs are categorized as full-time employees with a proper remuneration structure. This assists with the sustainability and scaling of the program to other more rural and pastoral communities in Ethiopia.[20]

Zambia

Background

The Community Health Assistant (CHA) program is a national initiative in Zambia to improve primary health care services to remote communities. The first CHAs were trained in 2011-2012, and deployed in the latter portion of 2012. The government aims to scale up the program to train and employ 5,000 CHAs using a phased approach.[20]

Figure 4: A trained CHA in Zambia.

Health Needs

Similar to Malawi, and Ethiopia, communicable disease, mainly, HIV/AIDS, TB and malaria contribute greatly to the disease burden in Zambia.[20] There has also been a rise in the prevalence of NCDs over the last decade, with an additional increase in communicable disease and NCD co-morbidity.[20] Zambia also has a high burden of maternal, neonatal and child mortality. The country is not expected to meet the MDG targets for MDG 4 by the end of 2015.[20]

Program

CHAs are formally recognized by the Zambian MOH and the Ministry for Community Development, Mother, and Child Health (MCDMCH) as a health cadre. CHAs are expected to spend 20% of their time at the health posts and 80% of their time in the community undertaking household visits, providing community education and other health promotion activities.[20] CHAs work in an integrated manner with other formally trained health providers, usually nurses and environmental health technologist, and on occasion with physicians at the health posts.[20] In addition, CHAs work with community development assistances (CDAs), as well as social welfare volunteers. As a team, they work at the community level on issues relating to gender, environmental health, sanitation and hygiene, education and even personal finance.[20] CHAs receive training in emergency labour and delivery, and can prescribe simple drugs including malarial treatments and ibuprofen. The use of CHWs in this model, which began in 2007, with funding from the Clinton Health Access Initiative and support from the United Kingdom Department for International Development, will continue to expand adding an additional 3,000 CHAs over the next 5 years.

Key Concepts

One of the main strengths of the Zambian initiative is the recognition of CHAs as a formal cadre by the MOH and MCDMCH. The strong political support at a national level

has allowed CHAs to receive proper remuneration and incentives. As full time salaried employees, CHAs receive 2,600 ZMK per month (US$465) and other civil servant benefits. They are also given a bicycle, mobile phone, shoes, an umbrella, a backpack, and a uniform.[20] Proper remuneration and incentives has been a pillar of successful CHW programs.

Additionally, CHAs work as part of an integrated team. The CHA role encompasses services that include collaboration with other health professionals (typically nurses) on health promotion and disease management, while they are at the health post, but also work in collaboration with social welfare workers in the community.

Brazil

Background

The Brazilian public health system dates back to the late 1800s, however it was not until the country transitioned from a dictatorship to a democracy in 1985 that the use of CHWs became nationally instituted.[25,26] The first national CHW program was developed in 1991, after a decade of using CHWs in various regions to combat drought and other health challenges. The current model was implemented as part of Brazil's first national primary health care program; later, it was integrated under the Family Health Strategy. CHWs in Brazil are part of a broader primary care reform to expand coverage to all Brazilians. The Community Health Agents (CHAs) work in primary care, public health and community services with tasks varying in each stream. CHAs, as a health cadre were officially recognized in 2002. The ability of the government to scale up the CHW model to include 236,000 CHAs working as part of 33,00 family health teams has gained international recognition. It also greatly increased the ability of the primary health centres to expand its outreach services. Brazil's CHAs provide coverage to over 80 million people.[27,28]

Health Needs

Over the past few decades the health needs in Brazil have changed dramatically. This transition has seen the decreases in fertility rates, infant mortality and malnutrition, while life expectancy has increased.[20] Despite the advancements, Brazil is seeing a large increase in NCDs, particularly hypertension and diabetes, as well as other health issues, including unsafe abortions, an increase in teen pregnancy and a higher prevalence of sexually transmitted infections (STIs), as well as high rates of mother-to-child transmission of STIs.[20] Additionally, other health challenges in the country include the overuse of health care services and medications.[20]

Program

The CHA program was developed as a pilot in Ceará in the late 1980s as a response to a drought.[29,30] The pilot projects included the training of 6,000 women in 112 municipalities on breast feeding, oral rehydration salts and immunizations.[29] By 1989, 1,500 of the original 6,000 CHAs were incorporated into the new CHA system, which was formalized in 1991 as the national Community Health Agent Program (CHAP), which was later integrated with the Programa Saúde da Família (PSF).[31] Under the

PSF, municipalities manage Family Health Care Teams, within each team there are usually 4-6 CHAs.[20] Each CHA is responsible for approximately 150 families, some may manage up to 200 households.[20] The integrated Family Health Care team includes physicians, nurses, dentists, and social workers. The scope of the CHA varies with geographic distribution, but most Family Health Care Teams provide prevention, health promotion, and rehabilitative services. CHA accountabilities include promotion of exclusive breastfeeding, prenatal, neonatal and childcare education, immunizations, active participation in case-management of infections diseases, including the screening and treatment for HIV/AIDS and TB.[20] Overall, the success of the model has been measured nationally by collecting information on 3 health outcomes for each household visited by a CHW: declines in emergency visits, higher birth weights, and up to date immunization schedules.

Key Concepts

CHAs in Brazil benefit from a strong supervisory system comprised of nurses and physicians from local clinics. Supervisory nurses spend up to 50% of their time in the supervisory role, and the remaining 50% working in clinics. The integration of the CHAs in a broader health team has ensured that Brazil has a strong referral system. The CHAs report any ill person from their catchment area. Part of the CHA accountabilities is to actively follow-up with any ill patient to ensure the continuum of care once the individual is released from the clinic.[20]

As part of the PSF, Brazil implemented strong standardized processes across the nation. The CHAs work processes are delineated by a set of information sheets, which are completed with information collected at each home visit. These standard processes have allowed Brazil to track their progress via indicators. The indicators have shown drastic improvements, especially in infant and under 5 mortality.[20] Additionally, Brazil has been able to demonstrate drastic improvements in some of the poorest rural municipalities.[20]

Pakistan

Background

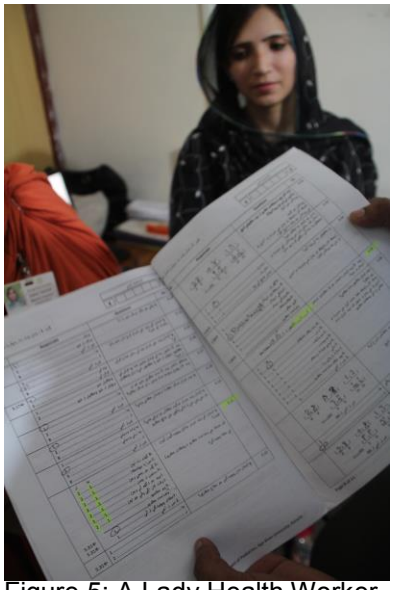
Figure 5: A Lady Health Worker reviews a patient record.

In 1994, the Pakistan government established the Lady Health Worker Program (LHWP) to provide primary care services to underserved populations in rural and urban areas. The model is governed by two national strategic goals: (1) improve the quality of services; (2) expand coverage of LHWP with the deployment of an additional 100,000 Lady Health Workers (LHWs).[20] The program has been expanded to cover over 70% of the rural population of Pakistan.[1,24] As of the latest estimates in 2008, there are over 90,000 LHW deployed throughout the 5 provinces in Pakistan. In 2000, the program was renamed the National Program for Family Planning and Primary Health Care, but is still commonly called the LHWP.[32] The scope of LHWP has evolved over time. Initially LHWs were focused on maternal and child health, now their tasks include health campaigns, neonatal care, case management of chronic illnesses and health education.[33]LHWs have been the focus of several large mass-media campaigns to promote respect for their position and also encourage community uptake of services.[34]

Health Needs

Maternal and child health indicators in Pakistan have remained behind in comparison to other South Asian countries, this includes both maternal and infant mortality.[20] Despite and increasing amount of doctors, having doubled from 1995-2007, access to health services remains poor, in particular in rural areas.[20] Culturally, health care access in Pakistan is limited, as women have limited mobility outside the home without an escort.[20]

Program

The LHWs are hired by the provinces and are attached to their local health facility, however they work primarily in their community, based at their home where they provide emergency treatment and care. The homes of LHWs are called Health Houses.[20] A LHW is responsible for approximately 1,000 people, with priority given to women of reproductive age and children under 5 years of age. LHWs visit an average of 27 households per week, consulting with an average of 22 individuals each week.[20] Over the course of program evaluations it was found that the communities with LHWs had substantially better health outcomes than those who did not, specifically in FP and immunization coverage for children. Expansion of the program is necessary for the LHW to have a stronger impact on a national scale. In terms of recruitment, there is a standard process that includes posting the position and the review of applicants by a committee. The selection committee includes health providers, administrators and community representation.[20]

Key Concepts
LHWs have a broad scope of work, but it is clearly delineated. It includes 22 specific tasks. These tasks include promotion of use of contraceptives and FP services, treatment of acute illness including diarrhea and malaria, referral of community members with more severe illnesses.[20] LHWs are also responsible for providing DOTs for TB patients, and keeping records.[20] Additionally, the high quality service provide by LHWs have been attributed to a selection process based on merit, an adequate supple of necessary materials, proper remuneration and standard processes for performance management and supervision.[35]

Alaska

Background
The Nuka System of Care is the health care system that is created, managed and owned by the Alaska Native People. The system was developed and is currently operated by Southcentral Foundation, a nonprofit health care organization that is Alaska Native-owned, and serves nearly 65,000 Alaska Native and American Indian people living in Anchorage, Matanuska-Susitna Valley, and 55 rural villages in the Anchorage Service Unit. The Nuka system came about due to an overhaul of a bureaucratic health system that was previously controlled by the Indian Health Service.[36] The Alaska Native people are at the centre of the Nuka System as 'customer-owners'.[36] The health system's mission is to focus on physical, mental, emotional and spiritual wellness as a united community.[36] The Community Health Aide Program (CHAP), which is operated by the Native Tribal Health Consortium, provides community health aide grants for qualified regional health organizations, like Southcentral Foundation, to train Community Health Aides (CHAs) and Community Health Practitioners (CHPs). According to state legislation all trainees have to complete an examination at the conclusion of the training to become fully qualified as a CHA or CHP. Additionally, Medicaid reimbursements are available for services provided by CHAs.


Figure 6: CHAs receive qualification training in Alaska.

Health Needs
Due to the geographic variability in Alaska, the heath needs are diverse. The CHA program was designed to provide primary care. Similar to many Indigenous populations, the Alaska Native People, particularly those in remote communities have disproportionately ranked lower in regards to health outcomes, than non-Indigenous populations. Of particular focus are dental, optometry, pediatrics, as well as

rehabilitative services for addiction and mental health. Lastly, increasing NCDs, including diabetes, obesity and hypertension are among common health concerns.

Programs
The CHA/P are delegated to provide primary care to the rural communities. The Alaska Native Tribal Health Consortium manages the program. There are 288 villages and 180 have at least one CHA/P. In these communities the CHA/Ps provide all of the primary care from chronic disease management to acute care. They are guided by CHAM, the comprehensive Community Health Aid Manual, in conjunction with remote support from a referral physician and other members of the primary care team, which can include nurse case managers. The CHA/P training provides sessional training for 4 levels of certification. The CHA/Ps are compensated based on their level of training and after passing the final level can become a CHP. Although they are not medically licensed, the care they provide is covered under the license of a supervising physician, who flies to the communities twice a year for direct observation and is in regular telephone contact with the CHA/P who s/he supports. The CHA/Ps report to the referral physician in terms of care, but they are hired and managed by the tribal authority.

Key Concepts
The Nuka System collects standard performance measures information for each community. The information is collected under the Healthcare Effectiveness Data and Information Set (HEDIS), which allows the communities, managers and other providers the ability to compare health plan performance to regional and national benchmarks. For over 75% of HEDIS measures collected and analyzed, as a whole, Southcentral Foundation ranks in the 75th percentile, or better. The Nuka system has received both national and international recognition for their work. They have been able to set high levels of excellence in service delivery, community engagement and overall improvement in population health.[36]

Minnesota

Background
The use of CHWs in the Minnesota state health system is gaining significant prominence as a tool to address health inequities in the system. CHWs are used in various ways throughout the health system. Under Federally-Qualified Health Centres (FQHC), CHWs are integrated within the primary care team and act as a “primary-care provider extender”. While other organizations utilize CHWs strictly for health promotion and community education. Educational services delivered by CHWs can be reimbursed through Medicare/Medicaid, while other services provided by CHWs are funded through the global primary budgets.

Health Needs
Minnesota’s health needs vary depending on the clinic. Generally, the management of NCDs and chronic conditions is of primary concern in the overburdened health system and of particular relevance to CHWs. Largely, the programs in Minnesota are focused

on urban clinics, although they are starting to provide some outreach to more rural areas. The changing demographics of Minnesota due to recent influx of immigrants and refugees from, for example Somali and Mung communities have highlighted the health inequities in the system due to the poorer health outcomes for these communities. CHWs, as system navigators, are an essential part of a strategy to close the gap in health outcomes. The American Indian Cancer Foundation utilizes CHWs as part of their colon cancer screening outreach program.

Program

Within the HealthEast system a FQHC, CHWs are known as care guides. Each of HealthEast's clinics employs at least one care guide who acts as a liaison between the patient and the care team. The care guides are trained in best practice for patient engagement, through the Minnesota CHW certification program. The CHWs coach patients through changes, remind patients of appointments, encourage them to continue medication and celebrate success. Depending on the clinic, CHWs may be utilized differently. HealthEast Stillwater uses care guides to work with patients on weight loss, while other clinics use CHWs as translators, working with patients in their native language to navigate the health system. Care guides within HealthEast are integrated into the larger primary health team. They work closely with physicians, nurses and social workers. CHWs are tasked with coordinating care for individuals within the community. The majority of these CHWs are generally physically co-located with their primary care teams, though there are a few CHWs placed in offsite sites frequented by vulnerable individuals, such as correction facilities, homeless shelters and outreach clinics. It was estimated CHWs spent about 15% of their time meeting or interfacing with new patients, 40% of their time doing outreach calls to checking-up on goals or plans, and generally as a way to maintain continuous relationships. The remainder of the time is spent helping patients finding resources, making reminder calls, and arranging appointments. CHWs on average have 150 patients on their panel, while some have upward of 250-300 patients.

Key Concepts

Minnesota CHWs have carved a space for themselves working closely with social workers, registered nurses, and physicians while coordinating care for individuals within the community. HealthEast noted that there was a 50% reduction in both emergency department visits and hospitalizations among patients who used services provided by CHWs. The successful integration of CHWs can be, in part, attributed to the Minnesota statewide college-level certification that CHWs must obtain before they are employed by a FQHC. In terms of the curriculum itself, it is specifically focused on core competencies, and is less focused on disease-specific training. It is offered both in-class as well as online, and usually takes 1-2 semesters to complete. The state-wide curriculum is designed so that the modules/credits can be used towards other bachelor degrees to facilitate other subsequent career trajectories. Though there are small (1-2 day) education modules sponsored by certain groups (such as disease-specific societies or organizations), there is no specific requirement or formal continuing education/crediting process. Although CHWs are not required to undertake the certification for employment, their services cannot be Medicare/Medicad reimbursed

and generally if a FQHC hires CHW without the certification, they have 18 months to complete it. In addition to the skills gained through the certification, it allows FQHC the ability to claim reimbursement for CHW services, thus legitimizing the role on the care team, and creating a more sustainable funding model for the position.

SUMMARY OF LESSONS LEARNED

Figure 7: Health Directors Meeting August 2015

The purpose of the programmatic report was to identify best practices in implementing a CHW program. There is a large breadth in typology of CHW tasks as well as program design, nevertheless, there are several take away lessons.

The CHW models in this review were focused on underserved populations. CHWs can be embedded within the care team, working along side health practitioners on a daily basis, which can lead to acceptance of the CHW role within the health care service. Several of the models in this report offered competitive salary for CHWs, while others also included incentives such as bicycles, phones, and shoes.

Retention rates varied by program, however, higher rates of retention were associated with opportunities for additional training or forward movement in the career trajectory of the CHW. In terms of standardized processes, there was differentiation between surveillance roles in comparison to active engagement in improving patient health, however, there is evidence of standardization of both these type of tasks, most notably in the Brazilian, Pakistani and Ethiopian model.

CHWs all received some form of training. Alaska, Minnesota, and Zambia had a state/country-wide uniform certification program, while other programs offered their own modular training such as the m2m program. Either way, CHWs all received some form of training.

The greatest strength of the CHW programs is the CHWs themselves. CHWs are connected to the community, which equates to a higher level of acceptability by community members.

There are several key areas in need of further research. Although many of the programs have standardized measures for services offered, it is difficult to determine how quality of care is measured for many of the models, and there is a significant gap in metrics and evaluations. Further research exploring standardized processes, and best practices for monitoring and evaluating the performance of CHWs would be an important next step, to give essential insight into developing programs that are effective, resilient and efficient for CHWs, the communities they serve, and the health system in which they function.

APPENDIX 1 – SUMMARY OF ALASKA, MINNESOTA, MALAWI AND ZAMBIA PROGRAMS				
	Alaska Community Health Aide/Practitioner (CHA/P)	**Minnesota Care Guides (CG)**	**Malawi Mentor Mothers (MM) (Mothers2Mothers)**	**Zambia Community Health Assistant (CHA)**
CHW Program	~550 (CHA/Ps) work in ~170 rural Alaska villages. CHA/Ps are the primary provider of health care at the community level.	~24-26 CHWs in the HCMC provide system navigation to 18 PHC clinics under the Health Care Home model. Their primary role is considered to be integrated health care coordination,	The M2M model was designed to improve PMTCT outcomes in health care facilities and community level. MM role is to provide peer education and support for pregnant women and new mothers to uptake PMTCT interventions, reduce the transmission of HIV and , active follow-up.	The CHA model is national initiative to bring PHC to the communities. The first CHAs were trained 2011-2012 and deployed to the most remote/difficult to access communities. CHAs are primary care focused. CHAs alternate days between home visits in the community and days are the facility. The expectation is for them to work in community 80% of the time.
Team Structure & Supervision	CHA/Ps work under the supervision of a referral physician via regular telephone contact + 2x yearly in person site visit. Day to day management is by the tribal authority. CHA/P's fly into larger centres once a year for direct observation.	In the clinics the care teams include: a physician, 2 nurse practitioners, 2 CGs and 2 social workers. The physician supervises the CGs in clinic, but they are supervised by a Care Coordination Manager.	MM are part of a team consisting of HSAs, CHOs, ART clerks, and nurses. MM report to the site coordinator who reports to district manager. There are 101 M2M sites in Malawi with 89 site coordinators supervising 174 MM.	The team consists of CHOs, DHOs, clerks, nurses, cleaners and CHAs. CHAs report to whoever is in-charge at the facility, a health professional of higher training, (e.g nurse). There is annual direct observation; but there has been request for more direct supervision and correction.
Responsibilities & Accountabilities	Provide all the primary care in the remote locations. They provide care to elders, pregnant women, infants and children, accident victims, and mental health and chronic disease patients and coordinate the appointments of other visiting health care professionals.	CGs have a panel of 250-300 patients who they set lifestyle goals. Time is allocated: 15% - meeting or interfacing with new patients; 40% - outreach calls or checking-up on goals; 45% - barrier busting (reminder phone calls, arranging appointments, finding resources.	In 1:1 or group sessions, MM provide health education and psychosocial support to other HIV-positive mothers on how they can protect their babies from HIV infection. They are highly effective peer mentors. They work to reduce the stigma of HIV by sharing personal experiences of disclosing status and finding employment post diagnosis. MM do nutritional assessments, including taking vitals, weight, BP.	CHA's main responsibility is health promotion and disease prevention. They provide pit latrine use and education, bed net use, they screen people for illness, provide HIV and TB prevention. There have been some cases of CHAs providing first aid level care, as well as dispensing medication and providing emergency labour and delivery support. They are also responsible for identifying patients who need to be referred to the next level of the health centre. Additionally, they visit the same households in the communities each quarter.

Recruitment & Training	CHA/Ps are selected by their communities to receive training. The curriculum is prepared by ARC, a group of instructors from CHA/P Training Centers, and field instructors. CHA training program provides sessional training for 4 levels of certification (based on CHA/P manual) A supervised period of hands-on training and a written test that leads to credentialing.	Recruitment processes vary by site. Common desired characteristics were passion for their work, interpersonal skills, and compassion and shared life experiences with the community to be served. HCMC requires the CGs to have completed the Minnesota statewide college-level curriculum. The curriculum is focused on core competencies, and less disease-specific training. It is offered both in-class as well as online, and usually takes 1-2 semesters to complete with an internship.	Interview committees work in collaboration with the health facility to recruit. MM are chosen from the community. M2M have program specific curriculum, they designed for MM. MM receive training in basic HIV/AIDS information, PMTCT services, discourse of status, breast-feeding, ARVs and HAART, safe sex and FP as well as nutrition and other lifestyle topics. They also receive training on how to rely their experiences in an informative way for other women. A large component of the model is encouraging women to access and utilize PMTCT services.	There is a standard application process. A committee, containing community representation, conducts the interviews with set standard questions. Each CHA comes form the community that they serve. CHAs receive one year formalized training on prevention, health promotion and curative care, credited through Health Professional Council Zambia. The first intake was 204, and the second was 315 CHAs. There are 12 training modules include theoretical and practical components and 6 weeks of rural exposure.
Retention & Remuneration	CHA/P's are employed by the Indian Health Service or tribe or Tribal Health Organization operating a CHA/P program under the ISDEAA. CHA/Ps are compensated based on their level of training. Starting salary is $45,000 USD (CHA 1), up to $70,000 USD (CHP), with the 30% inflation for working in rural areas.	It was noted that 50% of their CGs have stayed on long-term, while 50% turnover in the short term (12-18 mos). $26,000 - 40,000 USD per annum dependent on experience and certification.	Retention is high, because for most MM, this is their first formal employment and it increases their status in the community. Renewal of contracts is based on performance, including training, so if a MM does not pass training, then she will not be hired, which is in line with whole country team standards, for all health cadres.	CHAs receive 2,6000 ZMK per month (US$465). They also receive a bicycle, mobile phone, shoes, an umbrella, a backpack and a uniform. No turnover since beginning of program (2011/12).
Standard Processes & Quality Measurement	All processes are standardized via the Community Health Aide/Practitioner Manual (CHAM). CHA/Ps are all on EMR, open access for all involved in the care team HEDIS data is collected and used to compare each village to standardized national benchmarks.	All CGs have open access to EMR, the dashboard for Healthcare Home.	Site Coordinator does data analysis collected from each MM, including uptake of services. Quarterly that data is fed into the annual planning for the organization as a whole. There are quality assessments and quality indicators for each activity the MM facilitate guiding how they are delivered and the outcomes	CHAs report on the number of household visits, outcomes, sickness and treatments but the data analysis does not continue up the chain. The standard processes are AD-HOC and provider dependent. There were no systematic processes or quality measurements in place.

Policy Environment & Socio-Cultural Context	In 1968, CHAP received formal recognition and congressional funding. The long history of cooperation and coordination between federal and state governments as well as Native tribal health organizations has facilitated improved health status in rural Alaska.	The Minnesota Department of Human Services classifies CHWs as a trained health educator who possesses a valid certificate from the Minnesota State Colleges and Universities (MnSCU).	The M2M has worked in Malawi since 2008 empowering and educating HIV-positive mothers and expectant mothers to live healthier lives and to access the range of PMTCT interventions available. The M2M was an expansion of, a national program for PMTCT, which includes universal testing and life-long treatment.	The CHA program recently transitioned recently from MOH to Ministry of Community Development, Mother and Child. The government aims to scale up this national program, and employ over 5,000 CHAs.

ABBREVIATIONS	
ARC – Academic Review Committee	FQHC- Federally Qualified Health Center
ART – Antiretroviral therapy	HCMC –Hennepin County Medical Centre
ARVs – Antiretrovirals	HAART- Highly Active Antiretroviral Therapy
CEW – Community Extension Worker	HIV- Human Immunodeficiency Virus
CG – Care Guide	HSA- Health Surveillance Assistants
CHA – Community Health Assistant	ISDEAA- Indian Self-Determination and Education Assistance Act
CHA/P – Community Health Aide/ Practitioner	M2M- Mothers2Mothers
CHAM – Community Health Aide/Practitioner Manual	MM- Mentor Mothers
CHO – Community Health Officer	MnSCU- Minnesota State Colleges and Universities
DHO – District Health Officer	PHC- Primary Health Care
FP- Family Planning	PMTCT – Prevention of Mother to Child HIV Transmission

APPENDIX 2 – SUMMARY OF ETHIOPIA, BRAZIL AND PAKISTAN PROGRAMS			
	Ethiopia **Health Extension Workers (HEWs)**	**Brazil** **Community Health Agents (CHAs)**	**Pakistan** **Lady Health Workers (LHWs)**
CHW Program	The HEW program was established in 2004, it became the national formalized cadre of health worker. There are 2 female HEWs for each *Kebele,* which is a community of ~5,000 people. HEWs focus primarily on mothers and children under 5, other age groups are expected to travel to the PHC HEWs oversee the Model Family, these volunteers are trained by HEWs on household food and water sanitation, family planning, exclusive breastfeeding, immunizations, latrine construction and utilization, communicable disease prevention.	The Brazilian Community Health Agents Program (Programa de Agentes Comunitarios de Saude [PACS]) was created in 1991 by the Brazilian Ministry of Health, motivated by the good results achieved with the previous statewide community health agents (CHAs) experience in the northeastern state of Ceara. Under the Family Health Strategy (Programa da Saúde da Familia, or PSF), CHAs are part of a broader primary care reform to expand coverage to all Brazilian's.	In 1994, the Pakistan government established the Lady Health Worker Program (LHWP) to provide primary care services to underserved populations in rural and urban areas. The model is governed by two national strategic goals: (1) improve the quality of services; (2) expand coverage of LHWP with the deployment of an additional 100,000 LHWs.
Team Structure & Supervision	There is one supervisor per *Kebele.* The supervisor goes to the *Kebele* once a week for direct observation. They take a checklist and provide backup support. Supervisors can be nurses, midwifes, health officers. They review performances every month, and each month the HEW comes to the PHC unit to discuss their activities, performance issues, strengths and weakness.	Each team consists of a physician, a nurse and other health professionals, as well as 6-12 CHAs. The nurses supervise the CHWs indirectly. There are few opportunities for direct supervision, oversight or specific quality assessment beyond the initial training period. The human resources groups require that each CHW be assessed once yearly by the supervising nurse, and also complete a self-assessment, which addresses their knowledge, attitudes and skills, as well as their efficiency and effectiveness	LHW are hired by the provinces and are attached to their local health facility. * Need to ask Ben about the supervision.

Responsibilities & Accountabilities	HEWs have exactly 16 accountabilities; latrine (hygiene education), personal hygiene, water sanitation, nutrition, household sanitation, control of insects, care of mother and child, family planning, sexual and reproductive health, immunization, nutritional interventions for children and mothers, HIV/AIDS prevention, prevention and control of TB, prevention and control of malaria, first aid and treatment.	CHA accountabilities are split into Primary Care, Public Health and Community. Primary Care: CHAs offer support in chronic disease management, refer patients to appropriate primary care facilities, identify children at risk of serious illness, identify social determinants causing ill health, TB DOTS service support, and provide prenantal support. Public Health: CHAs improve uptake of screening, they identify children who have not been immunized, provide healthy lifestyle education, contribute to contact tracing of communicable infections, and collect data monthly on households. Community: CHAs act as a bridge or liaison between the community and the health services.	LHWs work primarily in their community, based at their home, called Health Homes, where they provide emergency treatment and care. A LHW is responsible for ~1,000 people, with priority given to women of reproductive age and children under 5 years of age. LHWs visit an average of 27 households per week, consulting with an average of 22 individuals each week. LHWs focus on maternal and child health, case management of chronic illness, treatment of actue illnesses, and health education. They have also been feature in several mass-media campaigns to encourage upakes of PHC services.
Recruitment & Training	HEWs are female, recruited with a grade 10 level education. They are primarily chosen from the community and speak the local language. The technical and vocational centres recruit HEWs through consultation with the *Woreda.* HEWs are given 10 months of training in the classroom and 2 months practical in the field. There are currently no national statistics available.	CHAs must be 18 +, completed high-school equivalency, and live in the community for more than 2 years. The recruitment focuses on the following; 1. Knowledge: language abilities and mathematics (assessed by a formal theoretical test), understanding of the environment and health, understanding of the local community and its citizens 2. Skills: communication and organization 3. Attitudes: communication, working in a team, commitment, flexibility, and initiative.	The provinces hire LHWs. They must be a local resident, have achieved 8th grade of education, recommended or accepted by community, 18-45 years of age, and preferably married. Selection process includes identification of health facilities, assessment/interview at health facility, selection committee chaired by MO and community representation. The training includes 3 months of class room training, and an addition 12 months of a practical module, with classes once per week.
Retention & Remuneration	Retention rates are currently unavailable. There is the possibility that HEWs can advance to become registered nurses. Possibility of advancing the role to be RN	Standard rates for remuneration R$1100 per month, based on 200 hrs per month. CHAs also receive a monthly debit care for food in an amount that is equivalent to other staff. Retention rates vary, in São Paulo, the annual turnover rate for the past years was 4.97%.	The monthly stipend for LHW is Stipend for Rs 3500.

Standard Processes & Quality Measurement	Supervisors check HEW logs manually, crosschecking the tally sheets with patient charts. They also sample patients chart and look at a month of two of activities within a quarter for the HEW. Immunization rates, antenatal care, postnatal care, BCG vaccine, pentacle vaccine are all monitored by HEWs.	As a national primary care strategy there are 3 streams of health outcomes that have been measured, improvement in overall health including decline in emergency visits, higher birth weights, up to date vaccine schedules. The CHA work processes are delineated by a set of information sheets (Fichas A, B,C), which are completed with information collected at each home visit.	LHWs have a broad scope of work, but it is clearly delineated. It includes 22 specific tasks. These tasks include promotion of use of contraceptives and FP services, treatment of acute illness including diarrhea and malaria, referral of community members with more severe illnesses, providing DOTS and keeping patient records.
Policy Environment & Socio-Cultural Context	HEWs developed from an agriculture extension worker model. The program is a response to MDG 4 and 5. HEWs have helped Ethiopia achieve MDG 4 ahead of its target.	The roots of the CHW model in Brazil begin in 1988 when the government created the Sistema Unico de Saúde (SUS) which was enacted to expand and provide free universal health care at point of service. Brazil began to view health as a right, which changed how services were delivered.	The program has been expanded to cover over 70% of the rural population of Pakistan. As of the latest estimates in 2008, there are over 90,000 LHW deployed throughout the 5 provinces in Pakistan

ABBREVIATIONS	
ARVs – Antiretrovirals	HAART- Highly Active Antiretroviral Therapy
ART – Antiretroviral Therapy	HIV- Human Immunodeficiency Virus
CHAs – Community Health Agents	LHWs- Lady Health Workers
DHO – District Health Officer	MO- Medical Officer
FP- Family Planning	PHC- Primary Health Care
HEWs – Health Extension Workers	PMTCT – Prevention of Mother to Child HIV Transmission

REFERENCES

1. Global Experience of Community Health Workers for Delivery of Health Related Millennium Development Goals: A Systematic Review, Country Case Studies, and Recommendations for Integration into National Health Systems
Global Health Workforce Alliance, World Health Organization, 2010

2. World Health Organization. Taking stock: health worker shortages and the response to AIDS. Geneva: World Health Organization; 2006

3. Standing H, Chowdhury AM. Producing effective knowledge agents in a pluristic environment: what future for community health workers? Social Science and Medicine. 2008;66(10):2096- 2107

4. Lewin SA, Babigumira SM, Bosch-Capblanch X, Aja G et al. Lay health workers in primary and community health care: A systematic review of trials. World Health Organization 2006.

5. Lewin S, Munabi-Babigumira S et al. Lay health workers in primary & community health care for maternal & child health and the management of infectious diseases. Cochrane Database Syst Rev. 2010(3):CD004015

6. Haines A, Sanders D, Lehmann U, Rowe AK, Lawn JE, Jan S, Walker DG, Bhutta Z. Achieving child survival goals: potential contribution of community health workers. Lancet 2007 369: 2121-2131

7. Sazawal S, Black RE. Effect of pneumonia case management on mortality in neonates, infants, and preschool children: a meta-analysis of community-based trials. Lancet Infect Dis 2003 3: 547–556

8. Kidane G, Morrow RH. Teaching mothers to provide home treatment of malaria in Tigray, Ethiopia: a randomised trial. Lancet 2000 356:550–555

9. Kisia J, Nelima F, Otieno DO, Kiilu K et al. Factors associated with utilization of community health workers in improving access to malaria treatment among children in Kenya. Malar J 2012 Jul 30;11:248

10. Mohan P, Kishore B, Singh S, Bahl R, Puri A, Kumar R. Assessment of implementation of integrated management of neonatal and childhood illness in India. J Health Popul Nutr. 2011 Dec;29(6):629-38

11. Yasuoka J, Poudel KC, Ly P, Nguon C et al. Scale-up of community-based malaria control can be achieved without degrading community health workers' service quality. Malaria Journal 2012, 11:4

12. Maes K,Kalofonos I. Becoming and remaining community health workers: Perspectives from Ethiopia and Mozambique. Social Science & Medicine 2013 87:52–59

13. Glenton C, Scheel IB, Lewin S, Swingler GH. Can lay health workers increase the uptake of childhood immunisation? Systematic review and typology. Trop Med Int Health. 2011 Sep;16(9):1044-53

14. Foreit J, Raifman S. Increasing access to Family Planning and Reproductive Health services through task-sharing. A Literature Review. USAID February 2011

15. Intrahealth.org. Rwanda: One of the First National Palliative Care Policies in Africa. 2011

16. USAID 2013 - USAID CHW Reference Guide- 2013

17. Malawi Country Profile 2015 http://www.unaids.org/en/regionscountries/countries/malawi

19. Malawi Poverty and Health Care : Our Africa http://www.our-africa.org/malawi/poverty-healthcare 2013

20. Perry H and Crigler L, editors. 2014. Developing and Strengthening Community Health Worker Programs at Scale: A Reference Guide and Case Studies for Program Managers and Policymakers. USAID/MCHIP. http://bit.ly/1AUBjtS

21.Gopinathan U, Lewin S, Glenton C. An analysis of large-scale programmes for scaling up human resources for health in low- and middle-income countries. 2012

22. Dynes M, Buffington ST, Carpenter M, et al. Strengthening maternal and newborn health in rural Ethiopia: Early results from frontline health worker community maternal and newborn health training. Midwifery; 2012

23. Banteyerga H. Ethiopia's Health Extension Program: Improving Health through Community Involvement. MEDICC Review 2011; 13(3)

24. Oxford Policy Management. Lady Health Worker Programme: External Evaluation of the National Programme for Family Planning and Primary Health Care 1999-2002: Final Report: Oxford Policy Management March 2002

25. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. Lancet 2011; 377(9,779): 1,778–97

26.Starfield B. Primary Care: Concept, Evaluation, and Policy. New York: Oxford University Press; 1992

27. World Health Organization. Community Health Workers: what do we know about them? the state of evidence on programmes, activities, costs and impact of health outcomes of using health workers. Geneva: World Health Organization; 2007

28. Rocha R SR. Evaluating the Impact of Community- Based Health Interventions: Evidence from Brazil's Family Health Program. Discussion Paper Series. IZA DP No. 4119. Discussion Paper No. 4119. Bonn, April 2009

29. Svitone EC, Garfield R, Vasconcelos MI, Craveiro VA. Primary health care lessons from the Northeast of Brazil: the Agentes de Saúde Program. Rev Panam Salud Publica 2000; 7(5): 293–302

30. Macinko J, Guanais FC, de Fatima M, de Souza M. Evaluation of the impact of the Family Health Program on infant mortality in Brazil, 1990–2002. Journal of epidemiology and community health 2006; 60(1): 13–9

31. Kluthcovsky AC, Takayanagui AM. Community health agent: a literature review. Revista latino-americana de enfermagem 2006; 14(6): 957–63

32. Bhutta ZA, Lassi ZS, Pariyo GW, Huicho L. Global Experience of Community Health Workers for Delivery of Health-Related Millennium Development Goals: A Systematic Review, Country Case Studies, and Recommendations for Integration into National Health Systems. In: WHO and Global Health Workforce Alliance, editor. Geneva; 2010.

33. Haq Z, Iqbal Z, Rahman A. Job stress among community health workers: a multi-method study from Pakistan. International journal of mental health systems 2008; 2(1): 15

34. Haq Z, Hafeez A. Knowledge and communication needs assessment of community health workers in a developing country: a qualitative study. Human resources for health 2009; 7: 59

35. Oxford Policy Management. Lady Health Worker Programme: External Evaluation of the National Programme for Family Planning and Primary Health Care – Systems Review, 2009. Available at: http://www.opml.co.uk/projects/lady-health-worker-programme-third- party-evaluation-performance

36. Gottlieb, K. (2013). The nuka system of care: Improving health through ownership and relationships. *International Journal of Circumpolar Health, 72*, 1-6 doi:10.3402/ijch.v72i0.21118