

Healthy Child Uganda

**Community Health Workers and Community Case Management:
Policies and Progress in Uganda within a Global Context**

Review of the Literature and Situational Analysis

April, 2011

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DISCLAIMER

This review is offered as a starting point to inspire further research and to foster discussion.

This paper is not an exhaustive systematic review. It simply provides an overview of the main current works in the literature relevant to community health workers and community case management; it seeks to point out key references and research issues and gaps that bear further investigation. Due to time constraints, not all of the articles that were identified as being of possible relevance are discussed, though many are compiled and listed in an appendix. Since other well-conducted systematic reviews were available and used to obtain information for certain sections of this report, researchers citing articles from this review should refer to the original references for direct quotations and interpretation. In many instances, the source cited in this paper contains citations to previous or additional sources. Hence, this paper itself should not be used as a citation.

EXECUTIVE SUMMARY

Global interest in community health workers is resurging, particularly as a vehicle to address maternal and child health care in the face of critical shortages of health workers in rural, sub-Saharan Africa. At the same time, interest is growing in a new, integrated approach to community case management of illnesses in children under five years old. As these movements gain momentum, the literature is changing quickly and new policies and recommendations are emerging, both at international and national levels. This paper is an overview of the literature from the perspective of the current situation in Uganda. It identifies and summarizes findings from major systematic literature reviews and other relevant documents on CHW programming and community case management; the objective is to provide an appropriate contextual framework for research on integrated community case management currently being conducted by Healthy Child Uganda in partnership with the District Health Offices of Bushenyi in southwestern Uganda.

More than 7 million children under age five (“U5s”) die every year; almost half of these deaths occur in rural sub-Saharan Africa. Child mortality rates are falling, but not quickly enough to reach Millenium Development Goal 4 (“MDG 4”), which aims to reduce the mortality rate of U5s by two thirds before 2015. Most U5 deaths are due to five primary causes – pneumonia, diarrhoea, malaria, measles and malnutrition – conditions that are preventable with well-recognized, low-cost treatments that are easy to use. In large measure, this is due to a shortage of health care workers, particularly in rural areas.

The picture in Uganda is similar; most U5 deaths are due to malaria, acute respiratory infections/pneumonia or diarrhea, with malnutrition being an underlying factor. The situation for children in rural communities is even more severe. Since 2000, prompted in part by the need to meet MDG targets, the Government of Uganda has chosen to make a concentrated effort towards community empowerment and mobilization for health; its main initiative in that regard is “to establish, train and sustain Village Health Teams (“VHTs”) in all villages in Uganda” as a strategy for strengthening the national health system.

At the same time, and at a global level, limitations in the disease-specific approach to case management of childhood illnesses have been recognized. In recent years, development of a new generation of programs has emerged, which in Uganda is called *integrated* community case management (“iCCM”). This program model, which continues to use case-based management by community health workers, is intended to address *several* illnesses in U5 children. In 2010, Uganda introduced implementation guidelines for iCCM of diarrhoea, ARI/pneumonia and fever/malaria. As these are major causes of U5 deaths and because two or more commonly occur together in the same patient, iCCM is being heralded as an important means to reduce U5 deaths. In addition, iCCM is seen as a way to “operationalize” the VHT concept. Consequently, decision-makers at both district and national levels are seeking opportunities to pilot iCCM models for training and study.

These circumstances inspired Healthy Child Uganda (“HCU”) to undertake an iCCM pilot project in collaboration with Bushenyi District Health Services. Since 2004, HCU has been training volunteer community health workers in southwestern Uganda to promote simple, preventative interventions to reduce U5 illness and death. As of 2010, the HCU model has been modified slightly for integration into the government’s VHT program that is being implemented nationwide. As little is known about how to implement, support and monitor a cadre of lay persons to provide iCCM, especially in a Ugandan setting and particularly as a comprehensive package, the HCU-CHW model is being used to assess whether the current scope of responsibilities of community health workers can be expanded to include curative interventions such as iCCM, and if such an integrated approach can provide improved access to effective and safe treatment for children.

In order to provide a situational context for the study and its anticipated outcomes, this overview examined the literature for similar studies and any research relevant to engaging CHWs in iCCM. To date, there do not appear to have been many studies of integrated CHW programs.

As evidenced by pledges made recently at the G8 and MDG Summits in 2010, maternal, newborn and child health is an area of high priority on the current global health agenda. To bridge the serious shortage in needed human resources, attention is turning towards “task shifting,” a strategy based on the principle that health care should be provided by the least specialized health worker that can provide appropriate and cost-effective care. To assist countries choosing task shifting as a part of their national health strategy, guidelines have been launched at the international level and Uganda has been at the forefront of that initiative.

Studies from the literature show that a range of tasks can be delegated so as to effectively optimize the use of CHWs; moreover, CHWs can increase access and overall use of health services, adoption of healthier behaviours, and reduction in U5 mortality. Concerns over task shifting, often voiced by professional bodies, include quality of care, supervision and program sustainability. Despite such concerns, task shifting appears to be on the rise.

Given this growing interest and prospective investment, there is a real need for means to compare and evaluate CHW programs and to determine the requisite factors for success. Based on the literature the following factors are key, for both program effectiveness and volunteer retention: community preparedness and engagement; referral system and connections to formal health system; multi-stakeholder involvement; recruitment methods (by and from community); clear selection and performance criteria; at least some formal education of CHWs; hands-on training and regular refresher training; supportive supervision and evaluation; reliable equipment and supplies; motivation and incentives (monetary or otherwise).

In that regard, the HCU-CHW model is a noteworthy example; its success has been attributed to the aforementioned factors, specifically, attention to local needs and priorities, alignment with local health systems, careful CHW selection, training appropriate to the setting and regular supervision. Based on several operational and research studies, the HCU model is associated with significant improvements in child health. A pre/post intervention household survey found reductions in prevalence of reported diarrhoea, fever/malaria and underweight status compared

with controls and CHWs reported a significant (over 50%) in U5 mortality during their first 18 months. High CHW retention (over 85%) has continued even after 5 years, which is higher than often has been reported for volunteer programs and may, at least in part, be attributable to support by program officials and communities, clear selection process and criteria, training and regular supervision, perceived program value to communities and to CHWs and both monetary and non-monetary incentives.

Uganda's *Constitution* and the *Children Act* provide the legal framework for protection and promotion of child health. The government's *Health Sector Strategic Plan* ("HSSP") is the primary policy document that provides an overall framework for the health sector to guide the implementation of priority interventions that will contribute towards the achievement of MDG targets. There have been three such strategic plans; HSSP III covers the current period and sets out specific targets to be met by 2015 that include, for example, increases in the proportions of U5s that receive treatment for malaria/fever, diarrhoea, and pneumonia. In order to meet these targets with the goal of achieving MDG 4, HSSP III emphasizes implementation of the interventions outlined in the government's *Child Survival Strategy* (a priority package that effectively treats the five major causes of death for U5s) and *The Road Map for Accelerating the Reduction of Maternal and Neonatal Mortality*.

Establishment of VHTs is seen by the Government of Uganda as its commitment to the aspirations and principles of the *1978 Alma Ata Declaration* and the *2008 Ouagadougou Declaration on Primary Health Care and Health Systems in Africa*, two keystone declarations that emphasize community involvement in health and health care delivery. The MoH has recently produced its *VHT Strategy and Operational Guidelines* and related documents with the intention of a more harmonized approach taken towards communities by MoH and its partners. The guiding principles are community ownership, equity and access, and community support. Although program implementation began in 2003, progress has been slow; to date, only about half of the districts have functional VHTs (an estimate that itself is not definitive).

In a move expected to help mobilization of the VHT concept, iCCM for the three primary childhood diseases (diarrhoea, ARI/pneumonia and fever/malaria) has been integrated into the VHT program. Whereas VHT members already are being trained to deliver and promote *preventive* interventions (such as immunization, hand washing, complementary feeding and bednet use), the iCCM strategy adds *treatment* to the scope of VHT activities so that preventive and curative activities will complement each other. The goal of the VHT program is to reduce child mortality and morbidity resulting from these three diseases with specific objectives that are to be met by the end of 2015 including, for example, to increase to at least 80% the proportion of U5s receiving appropriate treatment within 24 hours of onset of these illnesses. The MoH plans to build capacity for iCCM through training at four levels (national, district, health facility and community) for trainers, supervisors, health worker and VHTs.

Although the literature contains numerous studies of CHW illness management programs, there are few reported studies of "integrated" CCM programs (i.e. multiple illness), most likely because the approach is still relatively new. As early indications suggest that complexity of integrated treatment algorithms may contribute to the CHW's difficulties, this is an aspect of

programming that should be monitored closely. In sub-Saharan Africa where malaria and pneumonia account for about half of all child mortality, these two diseases exhibit a great degree of symptom overlap; many intervention programs take a presumptive, single treatment approach, thus, this may call for further iCCM research.

This paper references several major literature review papers that categorize CHW programs in different ways, e.g. according to model type, by disease, by region or country. In addition to integrated CCM programs, this report considered studies of CHW programs for each of the three diseases and malnutrition. There have been many reported studies of malaria programs; this overview describes a few of them as well as major evaluations of Uganda's *Home Based Management of Fever (HBMF)*. Although HBMF accounts for about half of treated cases and the proportion of children being treated is increasing, progress is hampered by several challenges, such as delayed delivery of antimalarials and inadequately trained health workers, thus, the evidence is limited as to its effects on large-scale implementation. Although malaria studies abound, many of them do not have comparison groups and even fewer are "randomized," making it difficult to draw inferences about community-based malaria treatment. By contrast, most studies demonstrate that CHWs classify and manage ARI/pneumonia effectively; in fact, a major WHO/UNICEF review concluded that the program model in which CHWs assess the signs of ARI and treat with antibiotics if there are signs of pneumonia is the program type with the strongest evidence for its impact on mortality. Few programs train CHWs to identify signs of severe dehydration or dysentery; this is of concern, given some indications that knowledge and use of appropriate home therapies to successfully manage diarrhoea may be declining and given new types of oral rehydration therapy. Few countries have any national policy to detect and treat severe acute malnutrition, possibly because until recently there was no clearly effective treatment strategy and treatment was restricted to the facility-based approach. New evidence suggests that children with severe acute malnutrition can be treated in their communities with timely detection by trained CHWs. Many of the "lessons learned" about CHW programming in general that are described earlier in the paper are also applicable to these disease-specific CHW programs. As time constraints did not permit a review of all the many individual studies, additional references for papers not detailed in this report can be found in the appendices.

Several challenges lie ahead in scaling up iCCM interventions in the developing world, challenges that include a scarcity of health care professionals and limitations in the healthcare system. New technology, such as mobile devices, may alleviate some of these limiting factors. This paper highlights a few reported studies on the use of mobile devices in CHW programming. Although still in its infancy, this emerging field is ready for investigation.

While a broad overview such as this cannot be exhaustive, it offers the reader the opportunity for a wider perspective from which to consider research gaps and areas for possible study. In regard to CHW programs generally, additional research has been suggested in these areas: effectiveness (e.g. comparing volunteers with paid staff, objective assessment of CHW short and long-term impact), supervision (specifics as to frequency and type), retention and motivation, scaling up, program sustainability, cost, monitoring and evaluation. In regards to integrated CCM, suggestions for further research include program effectiveness (particularly

using solid research methodology), training methods, cost, program design and evaluation. Carefully designed research is encouraged, as is the publication of failed interventions, given that lessons can be learned from both successful and unsuccessful efforts. Most research is largely donor driven; might this explain why dissemination of research results and translating those results into effective policy remains a challenge for governments?

In conclusion, it seems that the HCU pilot study of iCCM in Uganda is timely and appropriate. To a large extent, the study has been designed and driven by local stakeholders with local expertise and regular input from Ugandan policy-makers. Study questions seek to address important research gaps that have been well-identified in the literature and which will contribute to effective iCCM undertaken by CHWs. It is anticipated that outcomes of this research will be directly applicable to the expanded scope of responsibilities of VHTs in Uganda in the implementation of iCCM for the management of major childhood illness and could thereby contribute significantly towards better child survival.

ACRONYMS & ABBREVIATIONS

ACT	Artemisinin combination therapy
ANC	Antenatal care
ARI	Acute Respiratory Illness/Infection
ARV/T	Antiretrovirals (drugs)/treatment
CCM	Community Case Management
CHW	Community Health Worker
CIDA	Canadian International Development Agency
C-IMCI	Community Integrated Management of Childhood Illness
CORP	Community Owned Resource Person
DHS	District Health Services
FBO	Faith Based Organization
GoU	Government of Uganda
HBMF	Home Based Management of Fever
HCU	Healthy Child Uganda
HIV	Human Immunodeficiency Virus
HSSP	Health Sector Strategic Plan
iCCM	Integrated Community Case Management
IDRC	International Development Research Centre
IMCI	Integrated Management of Childhood Illness
IPT	Intermittent preventive treatment (for malaria)
ITN	Insecticide-treated nets
MDG	Millennium Development Goals
MoH	Ministry of Health
MUST	Mbarara University of Science and Technology
NGO	Non-Governmental Organization
ORT/S	Oral rehydration therapy/salts
PHC	Primary Health Care
SSA	SubSaharan Africa
TBA	Traditional Birth Attendants
U5	Under five years of age
UDHS	Uganda Demographic Health Survey
UNICEF	United Nations Children's Fund
VHT	Village Health Team
WHO	World Health Organization
Zn	Zinc

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

More than 7 million children under age five (“U5s”) die every year; almost half of these deaths occur in rural sub-Saharan Africa [1]. Millennium Development Goal 4 (“MDG 4”) is to achieve a reduction in the mortality rate of U5s by two thirds between 1990 and 2015 [2]. Child death rates are falling, but not quickly enough, especially in Africa [2, 3]. Consequently, few sub-Saharan African countries are on track to meet this goal [1]. In Uganda, the U5 mortality rate is approximately 135 deaths per 1000 live births.¹ As is the case with other sub-Saharan African countries, the rate is higher in rural areas.

Most of these child deaths are preventable. Over 70% of child deaths globally are due to five primary causes – pneumonia, diarrhoea, malaria, measles and malnutrition [4]. Many children who fall sick from these illnesses and conditions will die, despite the existence of well-recognized, internationally recommended treatments that are low-cost, highly effective, and easy to use. A shortage of health care workers, particularly in rural areas, contributes to the challenges of getting treatments to children living in remote communities. In recent years, there has been a resurgence of interest among the international community in the use of community health workers as a way to bridge the gap in human resources and reduce these child deaths.

Over the last decade there has been growing interest in addressing the limitations of disease-specific approaches, which has led the World Health Organization (“WHO”) and UNICEF (“WHO/UNICEF”) to develop a strategy known as Integrated Management of Childhood Illness (“IMCI”). This broad-based child health program consists of three components, the third of which is improvement of household and community practices, referred to as Community-IMCI (“C-IMCI”). Sixteen actions have been identified as key family practices that comprise C-IMCI, which include both preventative and curative practices. Uganda has recently identified integrated Community Case Management (“iCCM”) as a practical way to improve access to curative care for diarrhoea, malaria and pneumonia through treatment by community health workers. As a strategy, iCCM “amplifies the treatment arm of C-IMCI” [5] (at p. 4) and is intended “to deliver lifesaving *curative* interventions for common childhood illnesses, in particular where there is little access to facility-based services” [5] (emphasis added).

Healthy Child Uganda (“HCU”) has been training community health workers in southwestern Uganda since 2004. In collaboration with Bushenyi District Health Services, HCU is presently conducting a research study to assess whether the current scope of responsibilities of community health workers can be expanded to include iCCM and if such an integrated approach can provide improved access to effective and safe treatment for children. In order to provide perspective and context for that research and its results, this literature review will examine similar studies and research relevant to engaging community health workers in iCCM. To date, there do not appear to have been many studies of such interventions [6].

¹ Statistics vary: The official document most frequently cited is the Uganda Demographic and Health Survey 2006 in which the U5 mortality rate is 137/1000; a study conducted by Rajaratnam, 2010, indicates the current rate as 117/1000.

1.2 Background

1.2.1 Healthy Child Uganda (“HCU”)

HCU is a partnership that has developed a model child survival program, which was conceptualized and implemented by Ugandans with Canadian support [7]. The partnership uses a community-based training approach to address the challenges facing rural Ugandan families accessing health care services; this is achieved through the training of community health workers who are selected by their own communities and who then serve as health educators and promoters. Since 2004, HCU has trained over 1000 such workers (approximately 70% of whom are female) in more than 275 villages serving a population of about 95,000 in southwestern Uganda [8]. Results have been significant; an impact evaluation conducted over a three-year period found a 53% decrease in U5 deaths reported by community health workers over the first 18 months, an 86% volunteer retention rate and significant reductions in the prevalence of diarrhoea, fever/malaria and underweight children [9].

As of 2010, the HCU model has been modified slightly for integration into the government’s Village Health Team (“VHT”) program that is being implemented nation-wide² [10].

1.2.2 HCU: The Next Phase - An Expanded Role for CHWs

HCU trains volunteer community health workers (“CHWs”) to promote simple strategies that prevent childhood disease, such as bed net use, improved hygiene, antenatal care attendance, improved nutrition and immunization. CHWs are also trained to assess ill children; they recommend home treatment for mild illness and refer those with severe danger signs to health centres. But transporting very sick children in remote areas is difficult and often futile, as government health centres are frequently unstaffed or lacking adequate medications. Thus, referral alone is not entirely effective.

HCU-trained CHWs have demonstrated the ability and willingness to expand the scope of their responsibilities; they can be empowered to assess and provide simple treatment for sick children. Moreover, their communities are supportive of such an expanded role [11].

These circumstances inspired the HCU research team to undertake an iCCM pilot project, specifically to develop and evaluate the effectiveness of the HCU-CHW model as a system for distributing antimalarials, antibiotics and oral rehydration salts (“ORS/Zn”) to sick children in rural areas. As little is known about how to implement, support and monitor a cadre of lay persons to provide iCCM, especially in a Ugandan setting and particularly as a comprehensive package, the HCU-CHW model is being used as a platform to examine questions concerning implementation of iCCM in rural Uganda.

² Community Health Workers (“CHWs”) are known by different names. In the communities where HCU operates, they have been referred to as Community Owned Resource Persons or “CORPs.” The Ugandan Ministry of Health has recently rolled out implementation of its strategy for Village Health Teams (“VHTs”). In this paper, the generic term “community health worker” or “CHW” will be used, unless a particular country program is being described. In describing Ugandan activities, the current terminology will be used (i.e. VHTs), unless the context requires otherwise, such as in reference to a publication (e.g. *HCU CORPs Model*).

1.2.3 What is *iCCM*?

Predating *iCCM* is the concept of Community Case Management (“CCM”), which is used globally to describe a decentralized approach to community-based treatment of common childhood diseases by CHWs who dispense basic medicines. CCM was initially promoted to treat a *single* illness; an example is Uganda’s Home-Based Management of Fever (“HBMF”) program for distributing Chloroquine [11].

Recent years have seen development of a new generation of programs, which in Uganda are called *integrated* CCM (“*iCCM*”). This program model also uses case-based management and CHWs, however, it is intended for management of *several* illnesses in children under five years old. In Uganda’s *iCCM* program, CHWs provide assessments and management through an algorithm that helps CHWs identify and then address three illnesses: diarrhoea, acute respiratory illness (“ARI”)/pneumonia and fever/malaria. Although there is almost universal agreement on the need and the ideal benefits of expanding community-based management in this way, the approaches that should be used to achieve this goal, and whether such approaches can be practical and effective, are less obvious [12]. Programming for *iCCM* by CHWs could play a critical role, especially in sub-Saharan Africa, and has potential as a child health care solution that does not require inordinate investments in infrastructure or an expanded civil service [13, 14].

1.2.4 *iCCM* in Uganda

Uganda’s Ministry of Health (“MoH”), together with development partners, has recently developed implementation guidelines for *iCCM* of diarrhoea, ARI/pneumonia and fever/malaria [15]. As these diseases are the major cause of deaths in U5s in Uganda, and because two or more commonly occur together in the same patient, *iCCM* is viewed as the way forward “(t)o facilitate access to and reduce (the) treatment gap for malaria, pneumonia and malaria” [15]. It is also seen as “part of the effort to operationalize the Village Health Team concept” [15]. Consequently, decision-makers at both district and national levels are currently seeking support and opportunities to pilot *iCCM* models of training and study.

1.3 Purpose and Objectives

1.3.1 Purpose

The purpose of this literature review is to provide a contextual analysis for the HCU study,³ which will assess whether and how the scope of responsibilities of CHWs, specifically Uganda’s VHTs, can be expanded to include *iCCM* and if such an integrated, community-based approach can provide improved access to effective and safe treatment of common illnesses among children under five years old.

The literature related to CHW activities and CCM is changing quickly as the CHW movement in sub-Saharan Africa gains momentum. New policies have recently been developed, new articles

³ The study is being funded by Canada’s International Development Research Centre (“IDRC”) through the Africa Health Systems Initiative (“AHSI”).

in major peer-reviewed papers have emerged, and international consultative meetings have produced significant policy documents. It is necessary to review this literature in order to provide an appropriate context for the formulation of research questions and to provide perspective for the eventual research results.

1.3.2 Objectives

The objectives of this literature review are as follows:

- to highlight the relevant literature on health resources, CHW, CCM and iCCM to provide a contextual framework for the within research study;
- to summarize current child survival data for the Ugandan and East African region;
- to document the current status of national policy and programming related to child survival and CHWs, and;
- to identify critical gaps in knowledge that the research should address.

1.4 Literature Research Methodology

This review of the literature is not a systematic review; it is more of an overview of published results by others who have already undertaken extensive and exhaustive research in the subject area. It begins by identifying these major systematic literature reviews and other works on CHW programming and community case management, which are listed below:

- In 2010, the Global Health Workforce Alliance (“GHWA”), a partnership hosted by the World Health Organization (“WHO”), published a commissioned work principally authored by Z. Bhutta, Z. Lassi, G. Pariyo, and L. Huicho, entitled *Global Experience of Community Health Workers for Delivery of Health Related Millenium Development Goals* (referred to hereinafter in this document as “WHO/GHWA Report”) [16].
- In 2010, a consortium comprised of CORE Group, Save the Children, USAID-funded BASICS and MCHIP, published *Community Case Management Essentials: Treating Common Childhood Illnesses in the Community. A Guide for Program Managers* (referred to hereinafter in this document as “CORE Guide”) [5].
- In 2010, a Cochrane Review was conducted by Z. Lassi, B. Haider, and Z. Bhutta, entitled *Community-based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes* (referred to hereinafter in this document as “Lassi Cochrane Review”) [17].
- In 2009, a review was published by the Task Force on the Effectiveness of Community-Based Primary Health Care of the International Health Section of the American Public Health Association, with H. Perry and P. Freeman as Study Directors, entitled *How Effective is Community-Based Primary Health Care in Improving the Health of Children? A Review of the Evidence: Summary Findings Report to the Expert Review Panel* (referred to hereinafter in this document as “Perry Report”) [18].

- In 2007, A. Haines, *et al* published a review article in *The Lancet*, which focussed on child survival and interventions that directly improve child health, entitled *Achieving child survival goals: potential contribution of community health workers* (referred to hereinafter in this document as “Haines”) [6].
- In 2006, a report was prepared by K. Gilroy and P. Winch, funded by WHO and the United Nations Children’s Fund (“UNICEF”) entitled, *Management of Sick Children by Community Health Workers: Intervention Models and Programme Examples* (referred to hereinafter in this document as “WHO/UNICEF Report”) [12].
- In 2005, a Cochrane Review was conducted by S. Lewin, entitled *Lay health workers in primary and community health care* (referred to hereinafter in this document as “Lewin Cochrane Review - 2005”) [19]. It was updated in 2010, entitled *Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases* (referred to as “Lewin Cochrane Review - 2010”) [20].
- In 2001, a report that had as its main contributors K. Bhattacharyya, P. Winch, K. LeBan and M. Tien was published by the Basic Support for Institutionalizing Child Survival Project (“BASICS II”) for the United States Agency for International Development (“USAID”) entitled, *Community Health Worker Incentives and Disincentives: How They Affect Motivation, Retention, and Sustainability* (referred to hereinafter in this document as “BASICS II Report”) [21].

These were reviewed to identify relevant trials, key search terms and gaps in the literature. Key terms for "community health workers," "child health," "child mortality," "community case management" and their related concepts were identified and used in searches conducted in MEDLINE, EMBASE, CINAHL and Global Health. Additional searches were conducted for the period not covered by the reviews (October 2009 to December 2010). A complementary search was conducted using Google Scholar to locate some additional publications and “grey literature.” A visual depiction of this process is included in Appendix A.

Government documents from Uganda’s Ministry of Health were also reviewed, including the following: *Health Sector Strategic Plan III (2010/11 – 2014/15)*; *Child Survival Strategy for Uganda 2008-2015*; *Road Map for Accelerating the Reduction of Maternal and Neonatal Mortality and Morbidity in Uganda 2006-2015*; *Village Health Team: Strategy and Operational Guidelines, Integrated Community Case Management of Childhood Malaria, Pneumonia and Diarrhoea: Implementation Guidelines*.

1.5 Relevance and Potential Impact

Maternal, newborn and child health (“MNCH”) is an area of high priority on the current global health agenda. At the G8 Summit in Canada in June 2010, leaders of G8 countries reaffirmed their “strong support to significantly reduce the number of maternal, newborn and under five child deaths as a matter of immediate humanitarian and development concern” and launched the *Muskoka Initiative*, pledging another US\$5 billion over five years in international development assistance on top of US\$4.1 million that members contribute annually towards

MDGs 4 and 5 [22]. At the MDG Summit in September 2010, UN Secretary-General Ban Ki-moon called on efforts by “all partners”⁴ to work towards these MDGs; the Secretary General's *Global Strategy for Women's and Children's Health* sets out key areas in financing, policy and service delivery where action is urgently required [23]. Pledges made at that MDG Summit total over US\$40 billion in resources over the next five years directed towards MNCH. Given these recent commitments, even more efforts now must focus on MNCH program implementation. An important starting point in that regard is to identify those MNCH initiatives that have been proven to be most effective.

Community-based care is recognized as being a critical means to achieving improved child survival; this is especially so in the poorest countries of the world, particularly among rural populations in sub-Saharan Africa where progress towards MDG 4 has been slow [19, 24-26]. Achieving significant reductions in child mortality through C-IMCI alone remains challenging. For more rapid progress in an era of severe shortages in human resources for health care, iCCM is being promoted as a way to narrow the gap between limited services and high community needs. Expanding the scope of responsibilities of CHWs to include iCCM could lead to an even larger impact on child survival with potential to influence the future direction of community health programming and policy.

1.6 What is HCU?

HCU is an international partnership between Ugandan and Canadian universities with active participation by local Ugandan communities. The Ugandan partners are Mbarara University of Science and Technology, Mbarara and Bushenyi Health Districts; the Canadian partners include the University of Calgary and the Canadian Paediatric Society. These groups share a common goal of improving child health in rural southwestern Uganda [8].

Mbarara University of Science and Technology (“MUST”) is a university in southwestern Uganda with a mandate to support community-based medical education while training students for work in underserved areas. MUST first developed relationships with local communities when it opened in 1989. The Faculty of Medicine is a research institution that trains professionals for practice in rural areas and supports medical services and programming for local communities [27]. The HCU-CHW model was envisioned by MUST faculty members; MUST has led community entry, implementation of training, and management of field activities [7].

Mbarara and Bushenyi District Health Services (“DHS”) have been partners with HCU since its inception, serving as an important guiding force in programming and community outreach. District Health Officers participate in strategic and logistical planning, while health centre staff supervise and train the VHTs. HCU health promotion activities are carried out using staff, medical supplies and equipment from local health centres and the DHS [7].

Canadian Partners – Canadian paediatricians began visiting MUST in 1999 to support training of medical students at the university. In 2002, members from MUST's Faculty of Medicine

⁴ Governments, civil society, community organizations, global and regional institutions, donors, philanthropic foundations, the United Nations and other multilateral organizations, development banks, the private sector, the health workforce, professional associations, academics and researchers.

approached the Canadian doctors with an idea to start a training program for volunteer community health workers. A submission to the Canadian International Development Agency (“CIDA”) for a seed grant was accepted with the Canadian Paediatric Society and MUST as main partners. This is how HCU began [7, 8].

HCU has solid relationships with the communities it serves and is considered by its community partners to provide ethical, bottom-up and responsive programming. It has close connections with policy-makers and stakeholders at local, district and national levels. The research team is mentored by a group of senior-level academics and experienced international clinicians and educators. HCU has disseminated its results in peer-reviewed journals [9, 28] and through other papers and presentations [7, 29-33]. It has been recognized nationally and internationally with several awards.⁵

2. CHILD SURVIVAL

2.1 The Global Picture

Globally, a staggering number of children die before the age of five.⁶ It is estimated that in 2010, there will be 7.7 million deaths of U5s around the world with almost half of these (49.6%) occurring in rural sub-Saharan Africa [1]. Although the numbers are dropping - there has been a 52% decrease from 16 million in 1970 and a 30% decrease from 11.9 million in 1990 [1] - the decline is not happening quickly enough [1, 2, 18, 34]. MDG 4 seeks to achieve a reduction in the mortality rate of U5s by two thirds between 1990 and 2015 [2]. In 1990, the baseline year, global U5 mortality rate was an estimated 90 deaths per 1000 live births; in 2008 the ratio was 65 per 1000, representing a decline of only 28% [34]. Progress has been slowest in sub-Saharan African [16], even though “there is clear evidence of accelerating rates of decline in U5 mortality” during 2000-2010 in comparison with 1990-2000 [1]. Over the past decade, the *Child Survival Movement* has been gaining momentum; there are calls by many international advocacy and programming partners to better understand and reduce the huge burden of child mortality in order to achieve MDG 4 [35, 36].

It is widely recognized that most U5 deaths are due to conditions that are largely preventable and treatable [12, 35, 37]; the primary causes are infectious diseases, especially pneumonia, diarrhoea and malaria [12, 38]. Many children who fall sick from these diseases will die, despite the existence of well-recognized, internationally recommended treatments that are low-cost, highly effective, and easy to use. It is estimated that nearly two-thirds of childhood deaths could be prevented by a few basic and inexpensive interventions [35].

However, these known interventions are not being scaled up sufficiently to reach the MDGs. Two major barriers in that regard have been identified: one is the critical need to strengthen

⁵ Winner: 2008 Outreach and Community Relations Award, Association of Commonwealth Universities; 2008 “Best Practice” Award, 2nd Place: Civil Society Capacity Building Programme of Uganda; 2006 Makerere University Vice Chancellor’s Annual Excellence Award for Innovations: 2nd Place.

⁶ Global estimates vary, depending on the source. The number of children dying annually before the age of five has dropped from 18.9 million in 1960 to 9.2 million today (Perry, 2009, citing Ahmad, Black and UNICEF, at p. 1).

health systems to ensure service delivery, especially to those living in remote communities where the burden of illness is often high; the second is the shortage of health care workers [16].

There is growing recognition that child health care programs that involve the community in partnership have great potential for reducing U5 deaths at minimal cost [18]. Many examples, of both large and small scale projects, have been documented in major reviews, providing evidence that “strengthening community-based primary health care has the potential to accelerate progress in reaching the MDGs” [18] (at p. 1). Studies of these projects, however, have given less attention to “the role of the community as partner” and “the manner in which these proven interventions have been successfully implemented at the community level” [18].

2.2 Child Health in Uganda

In Uganda, maternal and child health conditions carry the highest total burden of disease [39]. Approximately 190,000 child deaths from all causes occur every year nation-wide [38, 40]; thus, survival of U5s is a major public health concern [39, 40]. Although the mortality rate for U5s has fallen to 137 deaths per 1000 live births in 2006⁷ [41] (down from 186 per 1000 in 1990) [34], Uganda’s child mortality rate remains among the highest in the world [42]. The goal of the government’s *Child Survival Strategy* [40] is to reduce the rate to 56 deaths per 1000 live births by 2015 [39]. Although the *rate of decline* has increased (from 1.6% per annum during the 1990-2000 period to 2.0% per annum during the 2000-2008 period) [34], it is insufficient in order to meet MDG 4 [34, 39]. In other words, although Uganda’s U5 mortality rate is declining, it is not happening quickly enough.

Most of Uganda’s U5 deaths are preventable. According to MoH documents, U5 deaths are due to neonatal conditions (23%), malaria (25%), ARI/pneumonia (19%), diarrhoea (17%), other conditions including vaccine-preventable diseases (10%) and HIV/AIDS (6%); malnutrition is an underlying factor in 60% of all U5 deaths [39, 40]. Two primary constraints identified therein to the implementation of maternal and child health interventions are shortages of health service providers and of child survival commodities.

Although almost 75% of Uganda’s population lives within a five kilometre radius of a health facility, there is great variability in accessibility [15]; many people in rural areas cannot access care due to poor transport networks and road conditions. A full package of services including outpatient care for the sick child is available in only 50% of facilities [15]. Many facility-based workers neglect to promote preventive health interventions and less than half assess the sick child’s immunization status, weight, and feeding habits [15]. Moreover, caregivers are seldom given essential information for proper home care of sick children: less than 20% receive advice on fluid intake, food intake, and symptoms that require immediate return for facility-based care [15]. Visual aids that could be used to educate caregivers are in short supply and are rarely used during consultations [15].

⁷ Exact figures vary, but trends are relatively consistent. The most frequently cited rate is 137 per 1000 from the Uganda Demographic and Health Survey of 2006/07.

Despite these challenges, some achievements in child health have been recorded in recent years. Between 2004 and 2009, there was an increase in access for de-worming and micronutrient supplementation, such as Vitamin A; the proportion of sick U5s seen by health workers using IMCI guidelines has increased to 63% from 45%; implementation of national Child Days Plus has contributed to an increase in immunization coverage; results of pilots in community growth promotion and monitoring show improvements in screening and identification of underweight children; promotion of infant and young child feeding has been integrated into various programmes; the proportion of U5s with fever, diarrhoea and pneumonia seeking treatment within 24 hours has increased; and the proportions of U5s with acute diarrhoea who receive ORT and of those U5s with pneumonia who receive antibiotics have also increased [39].

2.3 Child Health in Southwestern Uganda

The health status of children living in rural communities, however, is even worse than the national average. In southwestern Uganda, the U5 mortality rate is 180 deaths per 1000 live births (as of 2008) [43], compared with the national U5 mortality rate (137 per 1000). In a baseline survey of 1123 households conducted by HCU in 2006 [32], more than one third of all households had experienced one or more U5 deaths. Based on maternal descriptions, HCU researchers categorized the most likely causes of death to be malaria/fever (36%), diarrhoea (11%), ARI (6%), and neonatal complications (25%). Twenty one percent of child deaths had occurred during the first month of life and three quarters of all child deaths had occurred outside health facilities. In response to survey questions regarding illness, caregivers reported that 80% of children less than two years of age had been ill during the previous two-week period, either with diarrhoea (43%), malaria/fever (32%), or rapid/difficult breathing suggestive of an ARI (15%). Over eight percent of children had reportedly passed worms in stool or vomit and twenty-two percent of children less than two years of age were moderately or severely underweight.

The HCU 2006 baseline survey [32] also assessed common health practices. Nutritional deficits in weaning diets were noted, even though breastfeeding for babies under six months of age was widely practiced (98%), and 58% of children 18 to 24 months of age were still receiving breast milk. Bed net use by the youngest child was very low (4%) and only 60% of children over one year of age had been vaccinated against measles. Most deliveries (70%) had occurred without a skilled birthing attendant present. Only 34% of mothers said they would first seek care for their sick child at a government health facility, rather than from a local drug shop or healer. Traditional treatment practices are still commonly used.

Child morbidity is complicated by extremely impoverished living conditions. The majority of the population in southwestern Uganda lives in remote rural areas where most villages are accessible only by murrum roads or walking paths. Homes are typically built from mud or local brick with thatched or iron-sheet roofing, and almost all lack running water and electricity. Sanitation is poor; most households use simple pit latrines and organized sewage systems are rare. The HCU 2006 baseline survey [32] revealed that it takes over 45 minutes, on average, to fetch water (often not from a clean source). Firewood, used for cooking and to boil water, is also scarce. Although southwestern Uganda is known for its fertile soil, communities often face food

insecurity due to population density, a lack of cash crops, famines due to intermittent crop failure, and other complex factors. Most families rely on subsistence farming to survive [7].

3. UGANDA'S HEALTH SYSTEM

3.1 Structure of National Health System

Uganda's MoH has the lead role and responsibility for the delivery of health services in the country [39]. The *Constitution* and the *Local Government Act (1997)* prescribe that central line ministries are responsible for policy, setting of standards and guidelines, supervision and monitoring, technical support and resource mobilisation; local governments are responsible for service delivery at district and lower levels [39]. In accordance with these legislative provisions, health service in Uganda is decentralised. Health districts and sub-districts play a key role and there is no "intermediate" administrative level (i.e. such as a province or state).

Health services are delivered by both the public and private sectors. The majority of facilities are government owned and operated; as of 2007, there were 2242 health centres and 59 hospitals in the public sector. By comparison, there were 613 health facilities and 46 hospitals owned and operated by private, not-for-profits and 269 health centres and 8 hospitals run by private health practitioners [39]. Most of the private, not-for-profit service providers are faith-based and located in the more remote locations [16].

Public health services are delivered through a progressive series of health centres ("HCs") at levels I through IV, general hospitals, regional referral hospitals and national referral hospitals [16, 39]. The range of health services offered is intended to increase with each level of care. The HC I has no physical structure but operates as a "virtual health centre" [16]; it is a team of people, the Village Health Team ("VHT") that works as a link between health facilities and the community [39].

Table 3.1 Uganda National Health Service Model

Health unit	Geopolitical unit	Population served	Services
HC I	Village	1000	Village health teams; community outreach
HC II	Parish	5000	Outpatient primary health care, basic staffing
HC III	Sub-county	20,000	Outpatient, maternity; staff includes a clinical officer and midwife
HC IV	Health sub-district (county)	100,000	Inpatient, complicated deliveries (including C-sections), basic operating theatre facilities, a laboratory, blood transfusions; staff includes a medical doctor
General hospital	District	100,000 – 1,000,000	Inpatient, secondary services, specialist services and staffing, laboratory and

			diagnostics
Regional referral hospital	Region (3-5 districts)	1,000,000 – 2,000,000	Specialist services
National referral hospital	National	20,000,000 +	Advanced tertiary care

Adapted from: Rutebemberwa, E., *et al.*, *Utilization of public or private health care providers by febrile children after user fee removal in Uganda*. *Malaria Journal*, 2009. **8**: p. 45.

Some resource constraints have been attributed to the decentralisation of health services; for example, because roles and responsibilities of district leaders have not yet been internalised. Supervision is often inadequate, both from the central level to districts and from districts to lower levels. Logistical problems frustrate the functioning of District Health Officers, especially in newly created districts and where there is inadequate funding [39]. Despite these constraints, a recent study shows that over the course of the last two decades while the health delivery system has been decentralized, its performance has improved significantly [39].

User fees were abolished in 2001 and health services are now free of charge in all public health facilities [39]. Although almost 75% of households are located within 5 km from a health facility (public or private, not-for-profit), facilities are under-utilized [39]. This is due to a variety of factors, including poor infrastructure, lack of medicines and other health supplies, shortage of human resources, and lack of accommodation at health centres [39].

Traditional and complimentary medical practitioners (“TCMPs”) also play an important role in Uganda’s health sector. TCMPs include herbalists, traditional bone setters, traditional birth attendants, hydro-therapists, spiritualists and traditional dentists and their services are available in rural and urban areas. About 60% of the population visit TCMPs first before visiting the formal sector [39].

The MoH has acknowledged that “75% of the disease burden in Uganda is preventable through improved hygiene and sanitation, vaccination against the child killer diseases, good nutrition and other preventive measures” [39] (at p. 14). Establishing VHTs at the community level is seen as a way to raise awareness about effective health interventions.

3.2 Health Care in Southwestern Uganda

Constraints in the health sector are generally more severe in rural areas. In 2006, HCU conducted an audit of health centres that serve the communities where HCU operates [32]. This revealed several constraints, with significant gaps between actual and proposed health services. For example, only 65% of HC II/IIIs had staff available at all times, either on site or on call; only 40% of HC IIIs had health workers trained to manage high-risk obstetrical complications; 91% of HC II/IIIs lacked organized transport for obstetrical emergencies; only

one of the three HC IVs was able to provide services for Caesarean sections and forceps deliveries. Although all HC IIs and IIIs reported that immunizations, vitamin A and deworming services were provided routinely and free of charge, 36% were unable to store vaccines on site due to a lack of refrigeration and 18% reported recent shortages of vaccines, needles or syringes. None of the HC II/IIIs had a full complement of recommended drugs, while 45% of HC II/IIIs and 100% of HC IVs reported recent shortages of anti-malarial drugs. The supply of other drugs was also variable, with notable deficiencies in antibiotics [7, 32].

During the HCU baseline survey [32], participants in focus group discussions identified important challenges regarding access to health care services. These included distance, poor transportation and under-serviced health centres [7, 32]. More than 25% of households are located more than five kilometres from a health facility [39], which may or may not be staffed and may lack essential health supplies. The travel required to reach facilities that provide advanced care, such as blood transfusions and obstetrical deliveries, can take hours, even days, and be extremely costly. Public transportation is limited and roads are either non-existent or in poor condition. During the rainy season, many roads are difficult to navigate [7, 32]. Although the MoH encourages routine immunization, access to vaccines remains a challenge for many children [7].

3.2.1 Bushenyi District⁸

Bushenyi is one of the districts where HCU operates and its health system is fairly typical for most districts in southwestern Uganda. It is the district where the iCCM study will be conducted. Bushenyi's health system consists of multiple players, including government, faith-based or non-governmental organisations ("FBO/NGOs") and private practitioners. The district is served by four hospitals: one is government owned, two are FBO/NGO and one is private. Only the government hospital is located in the rural area. The government health centres range from level two to four (HC II to HC IV). Various cadres of staff are mandated to run these facilities: there is one general practitioner at HCIV while other levels are managed by paramedical staff, nurses, midwives and aid nurses [43].

Malaria is widespread in the district. According to data from Bushenyi's local government, 39% of outpatients, 35% of inpatients and 25% of mortalities result from malaria (all ages) [43]. Cases are managed at HC II and HC III with severe cases referred to HCIV.

4. HUMAN RESOURCES FOR HEALTH

4.1 The Global Picture

One of the reasons that Africa is lagging furthest behind in reaching MDG targets is due to inadequate numbers of trained health care providers. In many African countries, large numbers of health care professionals are ill or dying from HIV/AIDS, poorly remunerated, inadequately supervised, and lacking equipment and drug supplies [16]. According to the WHO/GHWA

⁸ The political boundaries of Bushenyi District have been redrawn recently; although the following description is based on data from Bushenyi as previously delineated, it is nevertheless reflective of the situation throughout southwestern Uganda where HCU operates.

Report [16], 57 countries in Africa and Asia (36 in sub-Saharan Africa [44]) are facing health worker shortages and an estimated 4,250,000 are needed to fill this gap. This shortage of health personnel contributes even further to already weak health systems. Not only is there a shortage, there is also “maldistribution” of medically trained health professionals [44]; areas of greatest need are often in remote rural areas, which are frequently underserved. Despite considerable evidence that simple interventions can improve child health and survival, a major issue is the lack of sufficient numbers of trained health workers to scale up these interventions [16].

4.2 Human Resources in Uganda

Like many African countries, Uganda is experiencing a serious shortage in human resources in the health sector. In part, this is attributable to additional demands created by the HIV/AIDS epidemic; firstly, because special skills are required by health care providers working in HIV/AIDS prevention and treatment, and secondly, because many such workers have been affected by the disease themselves. Accordingly to government documents [39], the total number of health workers in Uganda (therein defined as doctors, nurses and midwives), including those in the private, not-for-profit sector, amounts to 59,000. This translates into a health worker/patient ratio of 1:1818, which is far below the WHO recommended minimum ratio of 1:439, the point at which a country is considered to have a critical shortage of health care workers [39].

The public health sector is plagued with vacancies at all levels; only 56% of positions are filled with qualified staff [15]. Many reasons are cited for these vacancies, including: insufficient training capacity, low levels of remuneration, poor working conditions, complex and lengthy recruitment procedures, lack of coordination between training institutions (which leads to hiring delays), and migration abroad in pursuit of more attractive opportunities [39]. Exacerbating the situation is inequitable distribution of health workers, as between the public and private sector, and also as between rural and urban areas. Almost 40% of the health workforce is working in the private sector [39]. Nearly 70% of medical doctors and dentists, 80% of pharmacists and 40% of nurses and midwives, are in urban areas serving 13% of the population [39].

4.3 Task Shifting to “Bridge the Gap”

As pressures mount to bridge this gap in human resources for health, interest is growing in the strategy known as “task shifting.” This is essentially a “rational redistribution” of scarce human resources; specific tasks are moved, where appropriate, from highly qualified health workers to those with less training and fewer qualifications [16, 45]. An underlying principle is that health care should be provided at the lowest effective level by the least specialised health worker that can provide appropriate and cost-effective care [46]. It is based on certain assumptions: first, that there is under-utilised capacity among less specialised health workers; secondly, that it is possible (and desirable) to shift certain tasks to less specialised health workers; and thirdly, that the number of less specialised health workers can be increased to accommodate increased responsibilities more cost-effectively [44].

While not a new concept⁹, task shifting has been receiving increasing attention as a possible way to strengthen and expand the health workforce, especially in countries that face a large HIV/AIDS burden, as in sub-Saharan Africa [45]. In 2008, at the first global conference on task shifting, a set of recommendations and guidelines were formally launched; these are intended to serve as a framework for countries choosing to adopt task shifting as a part of their national health strategy [45].

Shifting tasks to lay health workers has several advantages. It has been noted that CHWs can deliver most MNCH interventions cost effectively, that expanding the use of CHW's may reduce morbidity and mortality in U5s and neonates, and that training TBA's may improve perinatal outcomes and appropriate referrals [46]. Huicho compared results across four countries and found that health workers with less training performed as well as, and sometimes better than, those with training of longer duration; this was in relation to assessing, classifying, and managing episodes of routine childhood illness, and in counselling caregivers [47]. In an example from Uganda, little difference was noted in the safety of injections given by CHWs as compared with those given by more qualified clinical workers [48].

Task shifting has the potential to be cost effective; lay health workers could reduce health care costs if substituted for professionals, especially as they frequently can provide care closer to users. Studies have been done as to the estimated costs of CHW training in comparison with the costs of lives saved in Uganda, Ghana, Mexico, India, and Bangladesh [44] (citing Darmstadt study). However, the Lewin Cochrane Review – 2010 [20] found a lack of data on the costs and cost effectiveness of CHWs, suggesting further research is needed and careful program planning.

Opponents to task shifting see it as a “quick fix” approach that could dilute the quality of care and compromise the health system in the long term [46]. The argument does raise several issues that need to be addressed, including: how quality of care will be maintained; how workers will be remunerated to ensure program sustainability over time; and how supervision and worker retention will be encouraged [49]. Task shifting does not mean there will be a need for fewer staff; it requires more supervision by qualified health professionals of those less qualified. It also requires a functional referral system. This, in turn, requires training and incentives for qualified health professionals who are to provide supervision. It also requires supplies, equipment, and funding for implementation [46].

In some countries, policy makers are facing resistance to task shifting from professional bodies [47]. In Uganda, for example, the Professional Council of Pharmacists opposed training for pharmacy assistants, and the Nurses and Midwives Council opposed accelerated training for nursing assistants. Similarly, the Brazilian Medical Association opposed prescription of drugs by nurses, which hampered implementation of that country's IMCI program [47].

Despite such obstacles, task shifting appears to be a growing trend. Examples from several countries demonstrate that a range of tasks can be delegated so as to optimise the use of

⁹ In Ghana, task shifting was used “long before the term came into vogue.” The role of medical assistant was introduced in 1969 and this was followed by a number of similar initiatives (McPake, 2008).

CHWs, nursing assistants, nurses, midwives, clinical officers, and drug dispensers [46]. These less specialized workers, particularly CHWs, can deliver many of critical MNCH interventions, including: promotion of appropriate care seeking and breastfeeding; provision of supplies (e.g. contraceptives, clean delivery kits, supplements, and bednets); intermittent preventive treatment for malaria; improved diarrhoea management with ORS/Zn; detection and management of pneumonia; management of malaria; recognition, triage and treatment of severe acute malnutrition [46]. A note of caution has been given in that regard, however, that “these workers should not be expected to do many different tasks because quality of care is compromised by excess work load and complexity” [49].

Some countries that have implemented task shifting through CHW programming have achieved significant coverage. For example, in Brazil, CHWs provide service to 80 million; in Pakistan, Lady Health Workers (“LHWs”) cover 70% of the *rural* population [16] (emphasis added). As these examples demonstrate, not only can task shifting operate as a strategy to bridge the gap in human resources for health, “a range of tasks can be spread among various cadres of health workers who will improve access to essential care to *remote* populations” [47] (emphasis added).

On the other hand, as has been pointed out, task shifting “should not become an excuse for failing to remedy deficient public health services” [49]. It should not be “viewed as a panacea for the human resources challenges facing sub-Saharan Africa” [49]. Task shifting is just one part of an overall strategy that must also address a range of issues to maintain a healthy workforce.

4.4 Task Shifting in Uganda

Uganda has been implementing task shifting at an informal level “as a pragmatic response” to the health workforce shortage [46]. This has occurred, for example, in areas such as provision of antiretroviral therapy for HIV/AIDS, IMCI, and training of traditional birth attendants in obstetrical care. Much of this task shifting has occurred ad hoc, in the absence of clear policy or planning, and without monitoring or evaluation [46]. This may explain why there have been instances where task shifting is seen to conflict with certain professional regulations (e.g. training for pharmacy and nursing assistants, as noted above.)

At the same time, Uganda has been at the forefront of global policy initiatives that led to the task shifting guidelines and recommendations (having chaired the drafting committee) [44]. Since then, the MoH has initiated a process to formulate, using those guidelines, “a national policy on human resources for health aimed at reorganizing and decentralizing the health workforce” [44]. Whereas efforts are currently underway to develop a task shifting policy for the health workforce *as a whole*, a policy brief that focuses on task shifting *for the delivery of MNCH services* was produced in 2010 [46].

The term (for task shifting) used in Uganda is “optimising the use of health workers” to clarify that the focus is primarily on expanding the roles of less specialised health workers [44]. Regarding delivery of MNCH services, four options have been suggested for consideration, including the use of: 1) lay health workers (i.e. CHWs and traditional birth attendants); 2) nursing assistants; 3) nurses, midwives and clinical officers; and 4) drug dispensers. These four

options are viewed as complementary, the primary aim being “the optimal use of non-medically trained primary healthcare workers to ensure universal delivery of cost-effective MCH (*sic*) services” [46]. Given uncertainty as to costs and cost-effectiveness of all four options, “rigorous evaluation and monitoring of resource use and activities” is being recommended [44].

Consistent with this “task-shifting” approach, MoH has made nation-wide implementation of VHTs a top priority [10]. Noteworthy in that regard, “(e)xpanding the roles of less specialised health workers (task shifting) is unlikely to improve delivery of health care in the absence of a comprehensive policy. Consideration needs to be given to appropriate governance, financial arrangements, and effective implementation strategies to address the health workforce shortage, inequitable distribution of health workers, poor performance or inefficient use of health workers among others” [44] (at p. 33).

5. COMMUNITY HEALTH WORKERS (“CHWs”)

5.1 What are CHWs?

The term ‘community health worker’ (“CHW”) is used to encapsulate a wide range of actors with varying responsibilities. Generally, CHWs are individuals who are selected by their communities to receive condensed, simplified training on a range of health topics [50]. Some CHWs are trained to provide only promotion and prevention activities while others also take part in the management and treatment of illness. Some are trained to address only a single disease, while others receive training in a broad range of preventative, promotional and curative services [6, 16].

According to the literature, ideally, CHWs should be members of the communities where they work and should be answerable to those communities for their activities [16]. Unlike other health care professionals, CHWs may not be considered as formal employees of the health system; they should be supported by it, but are not necessarily a part of its organization [6, 16]. The training CHWs receive is typically shorter than that received by professional workers and although it may be recognized, usually does not result in tertiary certification [6, 16]. They are usually either paid nominally or not at all and often provide services on a part-time basis [6].

The CHW has been described as “a frontline public health worker, a trusted member of the community, considered the backbone of primary health care” [16] (at p. 179). The CHW is often the solitary means of household access to the health system and serves as a liaison between the community and health/social services. CHWs facilitate access to these services and often improve the quality and cultural competence of service delivery. They also build capacity among the community and its members by increasing awareness and self-sufficiency through a range of activities such as outreach and community education.

Community health worker programs are said to provide three main benefits: 1) health benefits, including improvement in health indicators, utilization of health services and changes in behaviours directly related to health; 2) non-health benefits to individuals, including information, culturally appropriate treatment and promotion of autonomy; 3) non-health social benefits, including community empowerment, sustainability and economic opportunities [16]. Primary

health care delivered by CHWs is a way to extend the reach of child health promotion interventions to rural communities [6, 16, 18].

5.2 Background and Current Trends

Community health workers became popular in the late 1970s as a key component of the Primary Health Care (“PHC”) movement. Building on China’s extensive use of “barefoot doctors” [51], the movement promoted community-based strategies to improve access to health services and information, and to address the wider socio-economic barriers contributing to poor health [52]. CHWs were viewed as a practical way to improve health for underserved groups in developing countries. Historically, their role has been shaped by two philosophical orientations: one which perceives CHWs primarily as health extension agents, the other as change agents for community empowerment [6]. Today CHWs are generally viewed as bridges between the health system and communities [50].

During the 1980s, CHWs were considered a cornerstone for PHC, as envisioned by the *Alma Ata Declaration* [6, 16]. In the 1990s, however, enthusiasm waned because of challenges in scaling up programs while retaining effectiveness and because of a shift in focus towards vertical programs [6]. Given the increasing interest in integrated primary care and recognition of the “enormous mismatch” between disease prevalence and optimal care, “it is now evident that this change in direction was misplaced” [16] (at pp. 13, 48).

Over the past decade, enthusiasm for CHWs has regained momentum. Major donors are supporting efforts to train tens of thousands of CHWs in developing countries, with particular emphasis on sub-Saharan Africa [53, 54]. This push for CHW training reflects international efforts to scale up interventions that will help achieve the MDGs and to strengthen health infrastructure on a global scale.

5.3 CHWs in Uganda

5.3.1 Experiences to Date

In Uganda in the 1980s, the Uganda Community Based Health Care Association, which is an extensive consortium of NGOs, began promoting community based health care; this was done with the support of the MoH, but working outside of its official structure [7]. Little information is available about the Association’s activities in subsequent years. Then in 2000, driven by a desire to meet MDG targets, the Ugandan government began efforts to harmonize various initiatives in community empowerment and mobilization for health [16]. Consequently, all three successive Health Sector Strategic Plans of the MoH have included a formal strategy to implement a nation-wide Village Health Team (“VHT”) program (described below Section 7.3).

Efforts to roll out the VHT program began in 2003 but progress has been slow [16]. Teams have been established in 75% of the districts in Uganda but only 31% of these districts have trained

VHTs in all villages¹⁰ [39]. The program is still considered to be in its infancy, although it now has the support of most stakeholders [16].

Uganda's VHT program is one of eight in-depth country evaluations covered by the WHO/GHWA Report on CHWs [16]. According to this report, assessment of the program has revealed that "the recruitment and initial training of the community health workers is highly functional. The clarity of role, supervision, performance evaluation and community involvement, documentation, information and management are functional but gaps still remain. Ongoing training, supply of equipment and supplies, provision of incentives and integration in a referral system are not adequately done. Worse still, there is no professional advancement offered" [16] (at p. 354). Attrition is quite high, which, according to government documents, is because of "lack of emoluments" [39] (at p. 5). The program has been described as having "a relatively strong supervision system, but within a weak health system" [16] (at p. 7).

Since 2004, HCU has been working to design, implement and evaluate a model CHW program in southwestern Uganda, as fully described in the *HCU CORPs¹¹ Model Report* [7]. Between 2004 and 2010, HCU implemented its program in 175 villages in the districts of Bushenyi and Mbarara. Since 2010, HCU-trained CHWs have been fully integrated into the VHT program and HCU continues to support training activities of VHTs in these two districts. To date, HCU has trained over 1000 VHT members in 275 villages, serving a population of 95,000 of whom 15,000 are children under five [8].

5.3.2 Future Direction

Some HCU-trained VHTs have expressed interest and willingness to expand the scope of their responsibilities beyond prevention, to include curative services such as the provision of basic medicines [7]. Indeed, studies in Uganda have demonstrated that VHTs are able to diagnose and treat pneumonia effectively [55], that they can successfully deliver injectable contraceptive [48], and in some districts, they are the service providers of drugs for Home-Based Management of Fever ("HBMF") [11, 56].

This context sets the stage for the next development phase in Uganda's VHT strategy. The MoH together with its development partners, has recently developed implementation guidelines that promote the use of iCCM by trained VHTs for the assessment and treatment of diarrhoea, ARI and fever/malaria [15]. This complements the government's objective to strengthen the national health system through its stated strategy "to establish, train and sustain VHTs in all villages in Uganda" [15]. (The government's policies for its VHT program and iCCM are described below in Sections 7.3 and 7.5, respectively).

¹⁰ Figures vary, because coverage is a constantly moving target. This figure is from *Annual health sector performance report 2008/09*. Kampala: Ministry of Health) (FN 4, in [3]; in contrast with HSSP III which states only 50% of the districts have functional VHTs.

¹¹ CHWs are known locally as "CORPs" – Community Owned Resource Person.

5.4 CHWs: Are They Effective?

With increasing interest and levels of investment in CHW programs, there is a growing need to ensure that these programs are effective [6]. Given the mixed results of such programs in the past and the difficulties of scaling up, evaluating their effectiveness and determining the contributing factors becomes particularly important [6].

As there are many different kinds of CHW programs, however, attempting to compare program effectiveness can be challenging. If evaluation is to be meaningful, the CHW programs being compared should be of similar program typology. One simple method is to group programs as follows, as to whether: (1) CHWs provide preventative interventions only without referral; (2) CHWs provide preventative interventions, assess and refer; (3) CHWs provide curative interventions (a) for only one type of illness; or (b) for several types of illnesses. A different method was used, as described in the WHO/UNICEF Report [12], wherein CHW programs are classified according to use of antimicrobials, type of referral system, type of antimicrobial and use of systematic process to classify sick children. The WHO/UNICEF Report classifies programs as one of the following seven types: Model 1: CHW basic management and verbal referral; Model 2: CHW basic management and facilitated referral; Model 3: CHW-directed fever management; Model 4: Family-directed fever management; Model 5: CHW malaria management and surveillance; Model 6: CHW pneumonia case management; Model 7: CHW integrated multiple disease case management [12].

5.4.1 Review of the Evidence

Over the last ten years, a growing number of program studies and systematic reviews have shown that CHWs improve access to and use of health services, adoption of healthier behaviours, and actually reduce mortality [6]. This section looks at some of these major reviews and their findings.

- **WHO/GHWA Report**

In 2010, the Global Health Workforce Alliance (“GHWA”), a partnership hosted by the World Health Organization (“WHO”), published a commissioned work principally authored by Z. Bhutta, Z. Lassi, G. Pariyo, and L. Huicho, entitled *Global Experience of Community Health Workers for Delivery of Health Related Millenium Development Goals* (“WHO/GHWA Report”) [16]. This was a systemic review of studies that “had relied upon CHWs in community settings,” and included randomized, quasi-randomized, before/after trials, as well as “other less rigorous study designs.” Studies were eligible if they detailed the role of CHWs and if outcomes related to health and nutrition MDGs; ultimately, 231 papers were included in the review. The report also included eight in-depth country case studies, one of which was conducted in Uganda and examined the national VHT program.

A key finding was that although services offered by CHWs have helped in the decline of maternal and child mortality rates, coverage and progress is very slow, and relates to fragile health and economic systems [16]. Reviewers found that “almost all of the CHWs (*sic*) driven interventional studies showed a significant impact on reducing maternal, perinatal and neonatal

mortality and improvement in perinatal and postpartum service utilization indicators” [16] (at p. 23). “Overall, the role of CHWs in services delivery for MNCH, nutrition, malaria, and tuberculosis is profound and showed improved maternal and child health...in their catchment areas”[16] (at p. 360). Results from the eight country studies “confirm that CHWs provide a critical link between their communities and the health and social services system” [16] (at p. 22).

The results of the WHO/GHWA Report [16] were also summarized according to the type of CHW intervention. In reviewing 9 nutrition-focused CHW programs, it was noted that “simple promotive interventions lead to create an impact on the nutritional status of children” [16] (at p. 50). Of 44 studies with a maternal health focus, almost all were shown to have significantly reduced maternal, perinatal and neonatal mortality. Of 22 studies of interventions with a focus on birth and newborn care, in those where CHWs received refresher training, interventions consistently had a greater impact. Of 30 programs that focussed on childhood illnesses and immunization, those using literate CHWs demonstrated significant contributions towards achieving MDG 4. Analysis of 29 intervention studies related to malaria prevention found “positive outcomes especially in studies with regular supervision” [16] (at p. 125).

- **CORE Guide**

In 2010, a consortium comprised of CORE Group, Save the Children, USAID-funded BASICS and MCHIP, published *Community Case Management Essentials: Treating Common Childhood Illnesses in the Community. A Guide for Program Managers* (“CORE Guide”) [5]. This guide covers basic information about CCM and the process of designing and managing a CCM program. In the course of doing so, several helpful case studies are provided as illustrations.

- **BASICS II Report**

In 2001, a report that had as its main contributors K. Bhattacharyya, P. Winch, K. LeBan and M. Tien was published by the Basic Support for Institutionalizing Child Survival Project (“BASICS II”) for the United States Agency for International Development (“USAID”) entitled, *Community Health Worker Incentives and Disincentives: How They Affect Motivation, Retention, and Sustainability* (referred to hereinafter in this document as “BASICS II Report”) [21]. The paper examined the use of various incentives to motivate and retain CHWs, particularly those serving as volunteers in child health and nutrition programs. It was based on a literature review and staff interviews from many organizations. The report states as its most important conclusion that “there is no tidy package of three incentives” rather, it is a complex set of factors that affects CHW motivation and retention [21] (at ix).

- **WHO/UNICEF Report**

In 2006, a report was prepared by K. Gilroy and P. Winch, funded by WHO and the United Nations Children’s Fund (“UNICEF”) entitled, *Management of Sick Children by Community Health Workers: Intervention Models and Programme Examples* (“WHO/UNICEF Report”) [12]. The review focussed on CHW programs to improve child health and manage sick children, and while larger-scale programs were sought, many smaller scale examples were also included.

Programs were identified through systematic search of major databases, through documents, by organizations and individuals, including interviews. The review classified CHW programs according to type, but “did not seek to formally analyse the effectiveness of different intervention models” [12] (at p. 4). It was noted that the overall available documentation varied in quality and relevance.

The WHO/UNICEF Report found that the most widely used approach is Model 1, where the CHWs’ role is to create awareness about prevention and treatment and to refer sick children verbally. The authors note that relatively little is known about its effectiveness, other than that knowledge of appropriate health practices among caregivers is increased and that “...increased levels of care seeking have made a significant contribution to reductions in mortality among U5s” [12] (at p. 6). In Model 2, the CHW performs comparable activities, except that its distinguishing characteristic is the element of “facilitated referral,” which includes promotion, monitoring, supervision, and addressing barriers to referral. An evaluation of this program in Peru found that over four years, the percentage of children under two years of age with suspected pneumonia that were seen by a qualified provider had increased from 32% to 60%.

Models 3 and 4 involve presumptive treatment of fever with anti-malarials and are most commonly implemented in malaria-endemic areas in sub-Saharan Africa. In Model 3, responsibility for the sick child is primarily the CHW, whereas in Model 4, responsibility lies primarily with the family with support from the CHW. In reality, programs fall along a continuum and the same program may function differently even from one village to another. In Model 3 the CHW classifies and treats febrile children and maintains a supply of antimalarials. An example of Model 3 is Uganda’s Home Based Management of Fever program (described below in Section 8.2). In Model 4, the family takes the lead role; examples of this Model are the CHW programs in Burkina Faso and Ethiopia.

Studies have found that Model 3 intervention programs can increase the number of patients receiving treatment, increase the correct administration of drug regimens in the home, and decrease malaria morbidity and parasitological indices, however, the impact on malaria mortality has been inconclusive. Interventions falling under Model 4 have been associated with improved administration of antimalarial drugs in the home and reductions in the incidence of severe malaria. A study of one Model 4 program examined its impact on mortality; it found that treatment of malaria by mothers in the home had resulted in an observed reduction of 40% in mortality among U5s.

Model 5 is more common in parts of Latin America and Asia where malaria transmission is not as intense and fever episodes may be attributable to other causes. This Model is typically implemented through national malaria control programs. These interventions generally function similarly to those in Model 3; the need for treatment is based on presence of fever, the CHW provides antimalarials and takes a blood smear that is used to confirm (and possibly modify) diagnosis. Two examples of Model 5 are CHW programs from Latin America and Thailand; several studies have evaluated these program outcomes with favourable results.

In Model 6, CHWs assess the signs of respiratory infections in young children, treat with antibiotics if there are signs of pneumonia, and refer severe cases to a health facility. It has been noted that, “of the seven intervention models, this is the model with the strongest evidence for an impact on mortality as well as a record of success in scaling up” [12] (at p. 12). Examples of Model 6 include CHW programs in Bangladesh, Nepal and India.

In Model 7, CHWs manage multiple diseases, typically the diseases targeted by IMCI, using an integrated algorithm that has been simplified for use by CHWs. They dispense medications and refer serious cases according to developed referral guidelines. The evidence suggests that CHW’s ability to manage multiple diseases is generally adequate; moreover, programs that expand the role of CHWs to include curative treatments have been found to improve the use of CHW services. The impact of these types of programs on health outcomes, however, has been little studied. Examples of Model 7 are the CHW programs in Kenya and Pakistan.

- **Haines Article**

In 2007, A. Haines, *et al* published a review article in *The Lancet*, which focussed on child survival and interventions that directly improve child health, entitled *Achieving child survival goals: potential contribution of community health workers* (“Haines Article”) [6]. It was based on literature searches by several of the authors and other materials. Authors concluded that, “although CHWs are not a panacea for weak health systems, the evidence base, despite limitations, does suggest they can have an important role in increasing coverage of essential interventions for child survival...” [6] (at p. 2129).

- **Perry Report**

In 2009, a review was published by the Task Force on the Effectiveness of Community-Based Primary Health Care of the International Health Section of the American Public Health Association, with H. Perry and P. Freeman as Study Directors, entitled *How Effective is Community-Based Primary Health Care in Improving the Health of Children? A Review of the Evidence: Summary Findings Report to the Expert Review Panel* (“Perry Report”) [18]. The Task Force carried out a literature search, the principle inclusion criteria being that researchers had implemented one or more interventions using a CBPHC approach and had carried out either a direct or indirect assessment of child health status. The report was based on findings from 416 published articles and other program documents and 53 published literature reviews of appropriate community-based interventions. The goal was to describe achievements of and potential for community-based approaches in improving child health and to identify knowledge gaps.

- **Lassi Cochrane Review**

In 2010, a Cochrane Review was conducted by Z. Lassi, B. Haider, and Z. Bhutta, entitled *Community-based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes* (referred to hereinafter in this document as “Lassi Cochrane Review”) [17]. It included 18 cluster-randomised/quasi-randomised controlled studies that evaluated the impact of community-based interventions to prevent maternal illness and

death in improving newborn health outcomes. The authors conclude that the review “offers encouraging evidence of the value of integrating maternal and newborn care in community settings through a range of interventions”...delivered through CHWs and health promotion.

- **Lewin Cochrane Review 2005/2010**

In 2005, a Cochrane Review was conducted by S. Lewin, entitled *Lay health workers in primary and community health care* (referred to hereinafter in this document as “Lewin Cochrane Review - 2005”) [19]. The 2005 review analysed 43 studies, mostly in USA, Canada and the UK to determine whether CHW programs are effective. The authors concluded that CHWs show “promising benefits in promoting immunisation uptake and improving outcomes for acute respiratory infections and malaria, when compared to usual care.” It was updated in 2010, entitled *Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases* (referred to as “Lewin Cochrane Review - 2010”) [20] to include 82 studies, 55 of which were from high income countries. The authors concluded that “CHWs provide promising benefits in (*inter alia*) reducing child morbidity and mortality when compared to usual care.” They found that use of CHWS compared to usual healthcare services “(*inter alia*) may lead to slightly fewer children who suffer from fever, diarrhoea and pneumonia; and may lead to fewer deaths among children under five.”

- **Country Studies**

Review of the individual or country studies also supports these conclusions regarding CHW effectiveness. A well-publicized CHW program in Gadchiroli, India, has been studied over the past decade, in comparison with a control group [57]. Dr. Bang and his team have demonstrated that “home-base neonatal care and management of sepsis can more than halve neonatal mortality in [their] high-mortality setting” [6] (at p. 2124).

Another very large and successful program, the Brazilian Family Health Program, has shown decreased infant mortality by 32% in 5 years [50]. Other programs have shown similar success; in Nepal, a meta-analysis of nine programs that utilized CHWs showed a 24% reduction in U5 mortality [58]; in India, a pilot health education program using locals to educate villagers on safe newborn care was found to reduce by one half the number of newborn deaths in three years [59]. In Bangladesh, a CHW program of preventative and curative care including antibiotic therapy resulted in a 34% reduction over 24 months in neonatal mortality [60, 61]. Following the introduction of CHWs in a health promotion only role in Armenia, “exclusive breastfeeding increased 31%, maternal knowledge of child illness signs increased 30%, knowledge of HIV increased 28%, and physician attended deliveries increased 15%” [62].

The use of CHWs to deliver high impact child interventions has helped Nepal make significant progress towards achieving MDG 4 (one of only 5 countries to do so) [63]. Thailand, too, has shown significant progress in that regard [59]. But the case of Thailand (and Brazil), illustrate one of the challenges in measuring effectiveness; although both have extensive CHW programs, they have concurrently invested heavily in improving facility-based services, thus, making attribution of success specifically to CHW interventions especially difficult [59].

Although the literature on CHW effectiveness is “becoming increasingly robust” [50], it is not entirely favourable; not all interventions and programs have been equally successful [6, 64, 65]. The Haines Article [6] found that, in certain cases, CHWs did not provide services consistently and quality was poor (citing [66]). A study that assessed the Lady Health Worker program in Pakistan found variance in quality of care depending on tasks; performance in recognising and treating ARIs was weaker than other skills such as diarrhoea management [6]. A study from Ghana actually reported negative health outcomes; in villages where primarily male CHWs were used, U5 mortality increased by 14% [65]. Moreover, efforts to evaluate program effectiveness illustrate the need for careful study design; one study in Gambia showed reductions in child morbidity in the intervention area but also in the control areas [6].

Apart from effectiveness, CHW programs have been beneficial in other ways. The Haines Article reviewed several studies and found “persuasive evidence” that CHW programs can be cost effective in comparison with other kinds of programs [6] (at p. 2125). Another benefit is that CHWs can be deployed in emergency situations; after an earthquake in Pakistan, over 8000 CHW were mobilized to provide preventative and curative services in remote and inaccessible populations [6].

5.4.2 Lessons Learned

- **Limitations in the Evidence**

As important as it is to assess whether or not a CHW intervention has been effective, of equal or perhaps even greater interest, is identification of those factors that contribute towards success. In this regard, the evidence base would only benefit from a greater willingness to publish failures and inconclusive results. One of the difficulties in identifying and evaluating contributing factors is incomplete documentation. For example, out of the total number of studies that were examined in the WHO/GHWA Report [16], few (36) indicated whether or not the CHWs were paid either a salary or an allowance for meals and transport. This lack of documentation precluded an evaluation of these as financial incentives, prompting the authors to call for more complete documentation on this, as well as information regarding level of formal education, content of training, refresher training, balance of practical/theoretical sessions, remuneration and time commitment for CHW activities, which would be helpful in better understanding the effect of these key program factors on CHW performance and effectiveness.

- **Factors for Success**

Nevertheless, the WHO/GHWA Report [16] identified several program factors that seemed to be associated with positive CHW program outcomes consistently, as follows. The *level of formal education* of CHWs had a positive influence on outcomes, with even a few years of formal schooling resulting in greater impact. The most effective *type of training* seemed to be a combination of didactic training with interactive sessions, practicum and field work. *Duration of training* on its own, however, did not seem to be associated with improved mortality outcomes. *Supervision* and ongoing *refresher training* was associated with good CHW performance. In some cases, a very strong *referral system* (in which CHWs would refer complicated cases to

nearby health facilities after initial management) improved outcomes. High *retention* of CHWs also contributed towards improved CHW effectiveness.

The WHO/GHWA Report [16] highlights success factors consistent with those identified by other review authors. The Haines Article [6] summarizes CHW program lessons learned as follows: supervision and support increase CHW effectiveness and sustainability; CHWs perform better with clearly defined roles and limited set of tasks; incentives (monetary or otherwise) probably reduce attrition and improve performance; community support and involvement helps sustain programs. The Haines Article [6] also groups the determinants of CHW program success into four broader contextual categories, but notes that their relative importance is likely to vary from one setting to another. These categories are: (1) national socioeconomic and political factors (macroeconomic policies, political will, poverty levels, governance and participatory structures, levels of corruption); (2) community factors (leadership, location and infrastructure, local epidemiology, health beliefs and concepts of illness, community mobilisation and empowerment); (3) health system factors (appropriate policies, use of effective interventions, drug distribution systems, remuneration, management and supervision, health systems research); and (4) international factors (donor policies, migration flows, technical assistance, biomedical research). Community programmers can perhaps exercise some influence over the factors in the second category, while more coordinated advocacy may be critical to influence in the other categories.

- **Limitations to Effectiveness**

Authors also have identified certain factors that seem consistently to limit the effectiveness of CHWs. In the WHO/GHWA Report [16], *low levels of formal education* among CHWs was identified as a major limiting factor. Other limitations that were identified include *traditional beliefs and practices, inadequate supplies of equipment and drugs, lack of refresher training, lack of interest by government, inadequate staff, lack of community involvement and high rates of attrition*. “CHW programs are often held back by unrealistic expectations, poor initial planning, problems of sustainability and the difficulties of maintaining quality” [16] (at p. 48).

High levels of CHW attrition obviously would have a negative impact on the effectiveness of programs. Relationships take time to develop, and connections that the community has with its CHWs may be lost when turnover rates are high, thereby reducing trust and further diminishing chances of future engagement. Reselection and retraining new CHWs adds to program costs and logistics. Factors identified in the literature thought to contribute to high attrition among CHWs include perceived low socio-economic status, long travelling distances, inconsistent medical supplies, inadequate stipends, lack of career structure or advancement, and not being equipped to communicate effectively with client families. Having too great a variety of tasks can add to job stress, which contributes towards drop out. CHW attrition can be alleviated with supportive supervision, incentives (both financial and otherwise) and standardized training and certification that provide a career pathway.

5.4.3 Contributing Success Factors

The following section looks at the factors that have been identified by researchers as associated with CHW program success. Retention success is discussed elsewhere, in Section 5.5.

- **Community preparedness and engagement** - The relationship between the community, the CHW program and the formal health system may affect the way the program has been introduced, by the degree of consultation and involvement of the community [6]. The Perry Report [18] found that in over half of the CHW programs reviewed, community participation, as well as linkage between the community and the health system, had contributed to the success of the program in improving child health. Authors of the WHO/GHWA Report [16] agree that community involvement, while vital is rarely practiced.
- **Referral system and connections to formal health system** - Interface between the CHW program and the formal health system may be important, from the perspective of engaging support from health services. If those within the formal system who will be required to supervise the CHWs are left out of program planning or lack an understanding of the CHW concept, they may subsequently fail to support the program. According to the WHO/GHWA Report [16], proper linkages between CHWs and the formal health system need to be established right from outset.
- **Multi-stakeholder involvement** - Development of CHW programs should consider involvement from all relevant stakeholders and be formally authorized by the MoH [16]. Strong links between partners improve program capacity, although the balance of the roles of each partner can vary with the program [12].
- **Recruitment methods** - The WHO/GHWA Report [16] emphasized that CHWs should be chosen from the communities they will serve and that communities should have a say in selection. Authors recommend that CHWs should be chosen by the households that they will work with, however, noting that “participatory selection processes remain an ideal that is relatively rarely practiced, particularly in large scale programs”[16] (at p. 27).
- **Recruitment criteria** - Criteria for CHW selection should be standard and transparent. Being a permanent resident in the community appears to be most important. Other criteria may include literacy, numeracy aptitude, competence and motivation. The WHO/GHWA Report [16] recommends that for programs involving maternal and child health care interventions, CHWs should preferably be female and married, and if they have any children, they should preferably be less than 5 years of age.
- **Education** - An educated person within a community has social standing and respect, which may make it easier for that person to impart knowledge and to effect a shift towards healthier attitudes and practices [16].
- **Training** - Described as “the most crucial element” [16] (at p. 360), training varies dramatically across programs in terms of length, depth, organization, approaches and responsibility. As already noted above, the most effective programs often involve didactic training with ample interactive sessions that include small group discussions, role playing and field activities. The WHO/GHWA Report [16] recommends classroom training for at least 6 months with an additional 6 months of hands-on training.

- **Refresher training** – Many programmers consider these sessions almost as important as initial training; a number of studies have demonstrated that where regular refresher training is not available, acquired skills and knowledge are quickly lost [16].
- **Supervision** – Much CHW literature acknowledges the importance of regular and reliable CHW support and supervision. Unfortunately, supervision is often the weakest link; the WHO/GHWA Report [16] recommend detailed supervisory guidelines and possible supervision by members of the community trained in supervisory skills. Authors note that the success of small scale projects may be due to effective support and oversight, often from the community itself. That is more difficult in scaled up programs, where supervisory roles are not clearly defined or are inconsistent. Participatory and supportive supervision is recommended, with two-way communication and effective role model supervisors.
- **Equipment and Supplies** – The WHO/GHWA Report [16] notes that reliable transportation for CHWs, consistent and regular supplies of drugs and equipment are important to the success of CHW programs. Without these, not only are CHWs unable to perform many of their duties, their standing within the community can be undermined.
- **Evaluation** – The WHO/GHWA Report [16] recommends that programs evaluate their own performance annually and that third party evaluations be conducted every 4-5 years. Such outside evaluations should be published, so that lessons learned can be disseminated.

Based on their review of numerous CHW studies, the WHO/GHWA Report [16] recommends that CHW program planners and managers ensure that the roles and responsibilities of CHWs are established and defined; that criteria and methods for recruitment are clear; that competency-based training is conducted; that necessary tools (such as job aids and algorithms) are provided to enhance and maintain performance; that actions are taken to maintain performance, including supervision and support; and that performance is measured regularly to identify problem areas and provide feedback.

5.4.4 The HCU Model: Its Effectiveness

Healthy Child Uganda (HCU) has developed and implemented a volunteer community health worker model to promote child health in rural southwestern Uganda that has been operating since 2004 [7]. From 2004 to 2010, the model involved volunteer CHWs in the role of MNCH health promotion.

Although the HCU-CHW model is not included in the above-mentioned CHW program review papers, it is worth brief discussion owing to its high retention, significant effect on child health, and notable community spin-offs [7]. An impact evaluation using quantitative and qualitative tools was conducted between 2006 and 2009 to assess the effect of volunteer HCU-trained CHWs serving in a “health promotion-only” role on child morbidity, mortality and household health promoting behaviours. The evaluation included a household survey with baseline and post-intervention comparisons of intervention and control populations, retrospective review of a community health worker registry, community health workers’ monthly birth and child death reports, and focus group discussions. Intervention communities were comprised of 12 parishes

(total population ~61,000; under five years ~12,300) and 8 control parishes were used for comparison. Intervention communities received child health promotion provided by trained community health workers while control communities received the usual government and non-governmental health services only [9].

The impact evaluation demonstrated reduced rates of malnutrition and child morbidity from common illnesses, complemented by evidence of improved child health practices and reductions in reported deaths. In particular, household surveys revealed absolute reductions of 10.2% in diarrhoea prevalence, 5.8% in fever/malaria and 5.1% in underweight children which were statistically significant by comparison to controls. Household mosquito net use and measles vaccination were significantly improved with absolute increases of 37.2% and 10.6%, respectively. Monthly CHW reports revealed a 53% decrease in deaths of U5s during the first 18 months of the intervention [9].

The HCU study provides important evidence of success in sub-Saharan Africa with volunteer CHWs serving in a health promotion-only role [9]. Its results are consistent with findings from controlled intervention studies in south Asia (Bangladesh and India) that were noted above where CHWs had significant impact on child health.

Child health improvements in areas served by HCU-trained CHWs have been explained in the study as likely attributable to a range of factors; these include, but are not limited to parental health education, insecticide-treated mosquito nets, and active community and volunteer engagement in efforts to improve health outcomes. The latter may encourage impact beyond direct health outcomes to broader determinants of health like gender and economic opportunities, as attributed to CHWs by focus group participants. Success factors of the HCU model may also include: attention to local needs and priorities, alignment with local health systems, careful CHW selection, training appropriate to the setting and regular supervision [9]. These are factors that have also been identified in other successful community-based CHW programs, as noted above [6, 12, 16, 18, 67].

5.5 CHWs: Retention, Incentives and Motivation

5.5.1 Overview

CHW program planners worldwide are challenged by how to retain CHWs and understanding what keeps them motivated. Retention rates vary, but have been reported as low as 33% [21]. Volunteer-based CHW programs were previously noted to be associated with lower retention [68]; but retention is not necessarily better for paid CHWs. In recent studies, retention was reported as 33% among volunteer CHWs in Kenya (after 11 months) [69] and 52-70% among paid CHWs in Bangladesh (after 36 months) [70]. The HCU program boasts retention rates that are much higher, at over 85% after 5 years [9]. Mere retention, of course, is not enough; CHWs must also be motivated to carry out their duties [59]. Retention has been defined as the “length of time that an individual CHW actively performs appropriate community primary health care tasks” and motivation refers to the “desire to serve and perform effectively as a CHW” [21] (at p. 3).

Low retention and motivation have been cited as key problems hampering the cost-effectiveness, impact and sustainability of CHW programs [50]. High drop-out rates among CHWs disrupt relationships with the community and program continuity, increase costs and undercut capacity building [12, 16, 21, 71]. Another concern is that CHWs who leave may “set up shop” to provide unauthorized and unsupervised services [12]. Given that selecting and training CHWs represents a considerable investment of money, time, and human resources, reducing turnover and providing motivation are crucial for controlling costs, promoting program effectiveness and fostering sustainability.

Many of the factors that contribute directly towards program effectiveness also affect CHW retention. Although these factors have already been discussed in relation to their contribution towards CHW effectiveness (section 5.4.3), they are reviewed here in relation to their contribution towards CHW retention and motivation.

From the literature it is evident that the following are considered as key factors contributing towards CHW retention and motivation that must be addressed in every program: community participation, recruitment, selection, training, supervision and compensation [21, 50]. These contributing factors can be grouped into three categories: 1) operational inputs of the program; 2) importance of program to individual CHW and community; 3) monetary and non-monetary incentives [12].

5.5.2 Operational Inputs

Operational inputs may affect retention and include factors such as clarity about the roles of CHWs, characteristics of CHWs, selection process, program supervision, and support from ministry of health or program officials.

Clarity on Roles and Responsibilities: Clear CHW roles and responsibilities are likely important to retention because the community, health staff and CHWs themselves all may have different expectations [12]. Challenges identified by studies include when communities may expect CHWs to deliver more services than they are qualified to provide. Communities and CHWs may view the role of the CHWs as primarily curative, whereas program planners may see the need for preventative services. It has been suggested that planners include a written job description for CHWs that outlines the proportion of time spent on curative versus preventative activities, the number of households for which a CHW is responsible, and the position of CHWs within the health system hierarchy.

Selection Process: There is a growing body of evidence that meaningful community participation in selection is strongly correlated with improved retention [7, 9, 59, 72]. In Senegal, modification of the selection process to one involving in-depth community-wide discussions resulted in a dramatic drop in attrition rates [59]. In Bangladesh’s BRAC program, careful community selection has been identified as contributing towards its low drop-out rate through the 1990s [59]. By contrast, where CHWs have been selected by health staff or by local leadership, the result is often higher drop-out rates [68, 73]. Local leaders often select “on the basis of status or position,” rather than choosing those who are suited and committed to the role [59] (at p. 68, citing [21, 74]). Achieving a representative selection process is challenging,

however, especially if marginalized groups are to be included, and it requires more time and resources [59] (citing [21]).

Selection Criteria (Characteristics of CHWs): The literature does not seem to distinguish between “selection criteria” and “characteristics;” both terms are used to refer to gender, age, education, marital status - attributes that have been found to affect retention [12]. Examples indicate that single female volunteers have a higher turnover rate than male or married workers and that older and more educated CHWs are more likely to drop out [12]. The HCU experience has not noted any statistically significant difference in retention between male and female CHWs [9].

In addition to attributes such as age and gender, the traits of an individual such as “sheer personality, capability and enthusiasm” also play a major role [68] although it is unclear whether this is a factor in effectiveness generally, or specifically affects retention and motivation. There does not appear to be much study in this area [59]. Community selection may favour the recruitment of individuals with these characteristics, who are also the most likely to stay on the job [7].

Supervision: The literature suggests that regular supervision can improve retention [12, 21, 72, 74]. In one program, volunteer CHWs who reported that the frequency of malaria slide collection by supervisors was insufficient were significantly more likely to drop out [12]. Another study found that attrition rates were two to three times lower among Guatemalan CHWs that were supervised compared to those that were not [59] (citing [21]). Some studies have found that supervision also has “the potential to improve motivation” as well as support professional development [6]. Supervision provides a support mechanism for the discussion of problems and for requesting assistance, while enhancing legitimacy in the community [52, 68].

Intensifying supervision, however, adds to program costs and requires motivation. The cost of supervision can “represent 40% of the total cost of a CHW” [59] (at p. 81 citing [75]). Moreover, without financial incentives and with the difficulties frequently encountered in accessing rural communities (poor roads, lack of fuel, inadequate or expensive transport), supervisors often lack the necessary motivation themselves to carry out supervisory responsibilities [59]. Emerging technology, such as cell phones, may help in that regard, and strengthen connections between CHWs, their supervisors and the health system [59].

Peer support, which arises during meetings and refresher training, has also been suggested to contribute towards improved retention and motivation [59]. Findings from several countries “show that peer support is as important to CHW performance as supervisory feedback” [59] (at p. 82, citing [21]).

Support of Program Officials and Community: The support of ministry of health or program officials, in the form of regular meetings and visits, may be an important aspect of retention [12]. Not surprisingly, lack of community support has been suggested as a major cause of low motivation and retention [21].

5.5.3 Value of Program to Individual CHWs and Community

According to several studies, many CHWs continue to participate because of the value that they themselves and their communities see in the program [12]. CHWs often appreciate the opportunity to learn new skills and assume new responsibilities, which can increase their self esteem and enhance their standing in the community [12]. They may also appreciate the program's impact on the health of their own families and others in the community [12]. Evaluation of a program in Mozambique with exceptional rates of volunteer retention found that the primary reasons given by CHWs for remaining were the following: learning opportunities, health changes in their own families, and because their activities were valued by the community [12]. Similar reasons were given during evaluation of a CHW program in Kenya [12] and in observations from Colombia [12]. HCU CHWs cited "improved child health in my community" and "improved educational opportunities" as the top two motivating factors to volunteer [9].

Curative vs Preventative Care: Some studies have found that curative treatment is usually more valued by the community than disease prevention activities [12]. Where CHWs are trained only in prevention, there can be "a disconnect between the demand for curative services sought by the community and the preventative role with which the CHW has been tasked" [59] (at p. 75, citing [68, 72, 76]). This diminishes the perceived value of the CHW's role, both by the community and the CHW [59] (at p. 75 citing [72]). Not surprisingly, CHWs trained exclusively in preventative services have sometimes been associated with lower rates of retention [59].

CHWs whose services include curative care may have higher levels of motivation [12]. A regular supply of drugs is important in such programs in order to maintain both CHW motivation and their credibility in the community [12, 76]. In deciding whether to include curative services within the scope of CHW activities, programmers need to consider the capacity of the health system to ensure regular drug supplies [74].

Training: One of the main reasons cited by CHWs as to why they volunteer is to learn new skills [21] while "inadequate training" has been linked to low confidence and high rates of turnover [77]. The literature strongly emphasizes the importance of participatory learning over purely theoretical, classroom instruction [75, 77, 78] as well as refresher training [59, 72]. Continuous training may enable CHWs to reinforce and develop their skills over time, build confidence, engage in a supportive environment with peers, and maintain regular contact with the health system [59] (citing [21, 72, 76]). For these reasons, authors strongly link refresher training to retention and motivation [21, 59, 72].

5.5.4 Monetary and Non-monetary Incentives

Although much of the early literature implies that the volunteer CHW program is the ideal, most programs pay their CHWs either a salary or an honorarium [6]. According to Walt *et al*, unremunerated CHWs may be difficult to retain, except under specific conditions, for example, in those countries where a strong tradition of volunteerism is founded on religion or social values, such as the Buddhist tradition in the case of programs in Thailand [68]. Even under these circumstances, volunteer retention has been challenging: in Sri Lanka, CHWs volunteered their services in hopes of subsequent employment; in Mozambique, volunteer CHWs began to

demand payment once the country shifted towards capitalism [59] (at p. 83, citing [21]). Reviewers conclude that there are almost no examples of volunteer CHW programs that have been sustained by the community over long periods [6, 50]. Of note, however is the HCU program - with its high retention success (over 85% over 5 years) among volunteers and an emphasis on non-financial incentives, it suggests that volunteer retention may indeed be possible in rural sub-Saharan Africa [9]. This is an area that requires further study, as little is understood about volunteerism among the poor in developing countries [59, 68].

Monetary Incentives: Financial incentives can include regular payments, such as salaries, as well as allowances for meals, transport, or training. An example of a paid CHW program is the Lady Health Worker in Pakistan; CHWs are on one-year contracts with the ministry of health, considered civil servants, and retention is quite high [12]. A similar program in Brazil pays CHWs approximately twice the average local income but no information on retention is available [12]. In the Haines Article [6], among the reasons volunteers continued, training and transport allowances were most commonly cited.

Financial incentives also include performance-based payments. For example, volunteer CHWs in the BRAC program are provided with a small loan to create a revolving fund that enables the purchase of drugs that can be sold at a profit. Their ability to earn an income is considered extremely important for motivation and retention [72]. There is concern, however, that fee for service or payments associated with drug sales “may encourage inappropriate treatment at the expense of prevention and overuse of medications” [6] (at p. 2127). Tied monetary incentives may also lead to a decreased emphasis on preventative activities [12].

Although a main advantage for paying CHWs is increased motivation and retention [12], other considerations include increased time commitment, greater accountability, and the ability to use negative reinforcement, such as dismissal. Of course, financial remuneration dramatically increases program cost and it also raises concerns over program sustainability. Payments that are delayed, irregular or too low can also lead to attrition or demands by CHWs for increases [21]. Payment inconsistency may lead to resentment between those CHWs who receive financial payments and those who do not or may create competition between programs. Financial incentives may lead to a shift in loyalty among CHWs, from being accountable primarily to their community towards greater commitment to program officials [12].

Non-monetary Incentives: “Program-related incentives” can be small items that show affiliation, such as identification badges, T-shirts, or uniforms, which may provide a material incentive, a sense of pride, recognition and status in the community and group solidarity [12]. “Work-related incentives” include items directly related to CHW duties, such as stop watches, supply carry bags, or other job aids; these also can have a positive effect on motivation [12]. “In-kind donations” can come from the community in the form of agricultural or household labour [12]. Some programs offer free or preferential treatment at health facilities for the CHW and family [12].

Training, which was discussed above, may be a valuable non-monetary incentive. Closely related to training is potential for professional advancement. The chance for a supervisory role or even a paid position can serve as an incentive, control attrition and maintain enthusiasm.

Programs in Nigeria and India have been cited as examples where job seeking has been a motivation for volunteerism [6].

There are many reasons why CHWs continue to participate; witnessing improvements to child health, declines in morbidity and mortality, a sense of personal accomplishment and service to the community are non-financial incentives that have been rated by volunteer CHWs as strong motivators [68]. Assuming that motivations are wholly financial or self-serving undermines “the ethos of public service” [79].

Recommendations: Maintaining motivation and retention of CHWs is an ongoing challenge. Perhaps the best approach, and one that has been recommended, is that policy makers consider using a mix of financial and non-financial incentives [6] and that these are varied over time.

6. COMMUNITY CASE MANAGEMENT: GLOBAL PERSPECTIVES, POLICY & PROGRESS

6.1 A Note on IMCI and C-IMCI

In the mid 1990s, a new strategy known as Integrated Management of Childhood Illness (“IMCI”) was developed by WHO/UNICEF that brought together numerous vertical and disease-specific global child health programs [4]. A primary focus of IMCI was to improve the quality of care for U5s in first-level health facilities through introduction of standard treatment guidelines and training of health workers [4]. Subsequently, IMCI evolved into a broader strategy consisting of three components: (1) health workers – training for improved case management of common childhood illnesses; (2) health system – improved support with supply of medicines and better facilities; and (3) household and community – improved practices related to prevention of illness, nutrition and care-seeking [4].

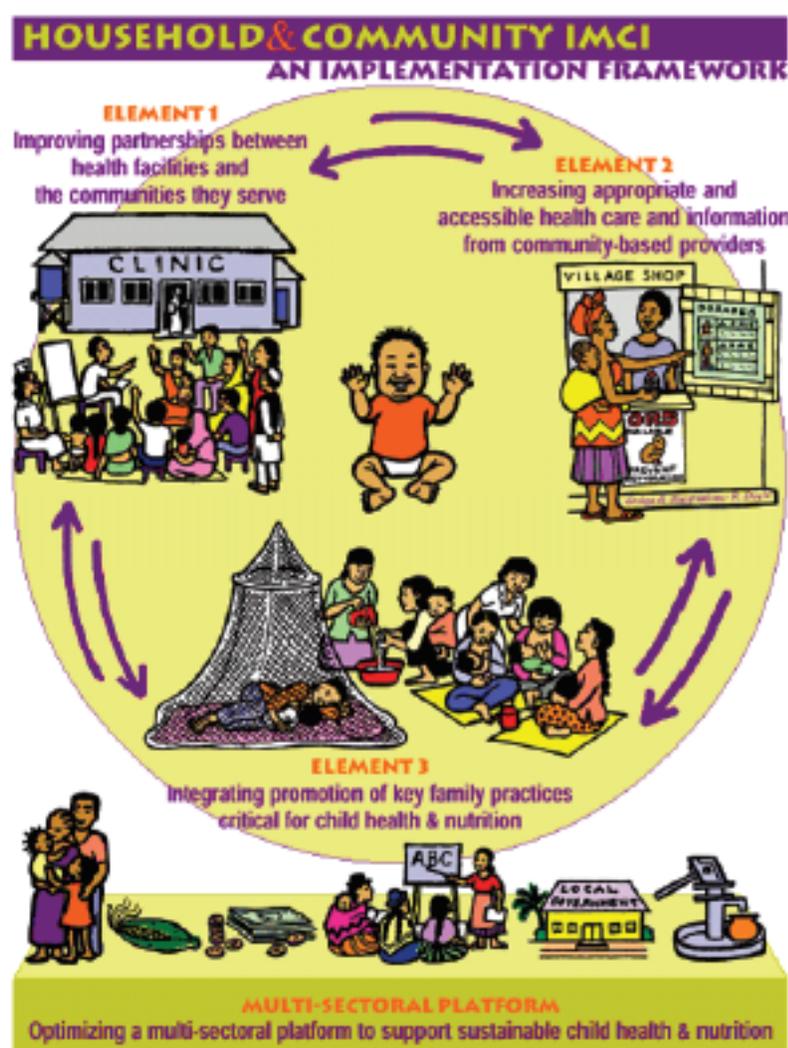
This third component is referred to as Community-IMCI (“C-IMCI”) or Household and Community IMCI (“HH/C-IMCI”) [4]. Unlike the first component, for which guidelines could be developed from existing disease-specific programs, C-IMCI has been more difficult to describe and implement [4]. Accordingly, WHO and UNICEF compiled a list of 16 key family practices to assist in program planning [80], which have been described as “the backbone of the C-IMCI strategy” [4]. These practices have been divided into four groups: (1) physical growth and mental development; (2) disease prevention; (3) appropriate home care; and (4) seeking care [80]. Although these practices define ‘what’ C-IMCI is intended to target, “determining ‘how’ to implement C-IMCI has been more problematic” [4].

Efforts to clarify C-IMCI implementation resulted in a “framework” that describes several categories of activities at the community level necessary for a comprehensive child health program [4, 81]. The three programmatic elements of this framework include (1) improving partnerships between health facilities and the communities they serve; (2) increasing appropriate and accessible care and information from community-based providers; (3) integrated promotion of key family practices critical for child health and nutrition [81]. At the base of the framework is a multi-sectoral platform, which is an implicit recognition that in order to achieve sustained improvements in health, the determining factors of ill health, namely poverty,

illiteracy and lack of access to water and sanitation, must also be addressed [4]. This framework now forms the core of the C-IMCI strategy that is advocated by WHO in Africa [4]. The concept has been graphically represented in the diagram that follows.

Studies have shown that the integrated approach of IMCI has potential to produce significant improvements in the quality of child health care [12, 82-85]. Impact of IMCI has been limited, however, because of the low percentage of sick children that seek care at health facilities [12] (citing [83, 84]). Moreover, the C-IMCI component, which has the potential to reach a much larger percentage of children, remains difficult to implement and to scale up.

Figure 1. Household & Community IMCI Implementation Framework



Adapted from Winch, P.J., et al., *An implementation framework for household and community integrated management of childhood illness*. Health Policy and Planning, 2002. 17(4): p. 345-53.

6.2 CCM and iCCM

What is Community Case Management? CCM is a term often used to describe “a strategy to deliver lifesaving *curative* interventions” (emphasis added) particularly in areas with poor access to facility-based services [5] (at p. 1). It has been said that CCM “amplifies the treatment arm of C-IMCI” while still supporting preventative measures [5] (at p. 1, 4). In CCM, CHWs assess patients and provide community-based treatment for illnesses, including conservative treatment, medicine and/or referral (i.e. task shifting). The term “CCM” could technically apply to CHW treatment of anyone or for treatment of a variety of illnesses (i.e. fever, pneumonia, HIV/AIDs); it is not necessarily limited to curative interventions for the treatment of children. CCM is usually taught and delivered using standardized algorithms.

What is integrated Community Case Management? iCCM describes delivery of curative interventions by CHWs using an “integrated” approach for the treatment of multiple diseases (i.e. more than only one disease at a time). In Uganda, iCCM describes a national program that targets three conditions in children; malaria, pneumonia, and diarrhoea.

It should be noted that in some of the literature, the term “CCM” is used to describe *any* curative intervention by CHWs, whether it is a single disease treatment or an integrated approach. By contrast, the term iCCM refers specifically to an integrated approach for multiple diseases.

6.3 The Need for integrated CCM

The need for an integrated multiple disease case management approach to treatment of major childhood illnesses has been recognized in several studies [6, 12, 86]. Because children may be afflicted with multiple illnesses at one time or may present with symptoms that could represent more than one possible diagnosis, CHW programs that target one specific disease are potentially limited in their impact [12].

Moreover, analyses from a number of countries indicate that scaling up high impact *curative* interventions - especially for treatment of pneumonia, diarrhoea and malaria, newborn care, and malnutrition - is critical in order to reach MDG 4 [5]. This is because these five conditions are the leading causes of death among U5s (pneumonia (17%); diarrhoea (16%); malaria (7%); neonatal causes (37%) about one-quarter of which are newborn sepsis/pneumonia [12]; and under nutrition is an underlying cause in 35% of these U5 deaths [5] (citing [12, 82]).

Broadening the role of CHWs to include curative interventions can serve to upgrade the skills of existing cadres of CHWs and, at the same time, strengthen connections between the community and existing health facilities [5]. Moreover, with an expanded role that includes curative treatments, it has been found there is greater use of CHW services overall [12](citing [76] and see example in footnote 12, below).

6.4 Overview of Global Efforts and Results

Global Efforts: Although a named global coalition of organizations dedicated specifically to advocacy and support for CCM does not yet exist, the Global Action Plan for the Prevention and Control of Pneumonia (GAPP) brings together UNICEF, WHO, and other partners “to focus on

actions to scale up community-based treatment of pneumonia, in the context of integrated interventions, including those addressing diarrhoeal diseases, malaria, and other conditions—the interventions that comprise CCM” [5] (at p. 223).

Nevertheless, a number of countries already have well-established national CCM programs (for example, Nepal, Pakistan, Honduras, and Senegal). Over forty countries have initiated some CCM activities, although most are not yet at scale [5].

Effectiveness of CCM: In the WHO/UNICEF Report [12], authors examined specific programs where CHWs use integrated management to assess and treat sick children having one or more of childhood diseases and noted that the impact of such programs on health outcomes has been little studied. The CORE Guide [5] also noted that there has been “limited experience with integrated programming for all five conditions” (at p. 4). In the Perry Report [18], community-based interventions that had the strongest evidence of reducing child deaths were found to be the following: promotion of oral rehydration therapy and zinc supplementation for children with diarrhoea; community-based treatment of childhood pneumonia; community-based rehabilitation of children with protein-calorie malnutrition through provision of food supplementation; and community-based treatment of malaria.

Effectiveness of disease-specific versus integrated CCM: The literature indicates that top-down vertical approaches to implement single interventions at community level can be very effective at scale (immunization probably being the best example), however, programs that have achieved success using an integrated approach have been on a smaller scale, at least as documented to date. There is some evidence, however, that an integrated approach can actually improve overall coverage of all interventions¹² [18].

Abilities of CHWs to diagnose and treat: Studies have shown that well-trained, supervised and supported CHWs, whether or not they are literate, can successfully diagnose child pneumonia, malaria, or diarrhoea and can provide effective treatment [5]. Their ability to manage multiple diseases is generally adequate, although inconsistencies have been noted in studies, often varying by disease and severity [12]. Experience with at-scale interventions from several countries demonstrates that iCCM actually increases the total numbers of children receiving appropriate treatment; it does not merely change the place where they receive it [5]. The research also indicates that allowing well-trained CHWs to provide treatment results in increases in appropriate care and that the quality of care provided they provide can equal or even exceed the quality of care in public health facilities [5].

Cost-effectiveness: Although community-based interventions for improving child health are among the most cost-effective interventions known, evidence for the cost-effectiveness of *integrated* interventions is less well-developed [18] (emphasis added).

¹² A study in Cameroon, Nigeria and Uganda that compared the coverage of ivermectin (for onchocerciasis) in control communities with coverage in intervention communities where CHWs provided integrated services. It was found that “not only were high levels achieved for the additional interventions, but coverage of ivermectin was greater in the communities with integrated services” (cited in Perry, 2009).

Future Directions: There is growing demand for CHWs to take on the management of the entire range of childhood illnesses and conditions targeted by IMCI, including not only malaria and pneumonia, but also diarrhoea and neonatal infections [12]. To move forward in that direction, simultaneous efforts are needed to strengthen health systems and ensure that the overall workload of CHWs is reasonable [12].

7. UGANDA'S NATIONAL HEALTH POLICIES RELEVANT TO CHILD HEALTH

7.1 Overview

The Government of Uganda's priorities are outlined in the current *National Development Plan*, which covers the period 2009/10 to 2013/14 [39]. In the sector of health, the government's stated priority is implementation of the *National Minimum Health Care Package*. Other priorities are promotion of health and prevention of disease, strengthening health systems, and programs of national interest, namely reproductive health and child survival, HIV/AIDS and tuberculosis, malaria and nutrition [39].

Under the stewardship of the Ministry of Health (MoH), the government has developed the second *National Health Policy* ("NHP II") for the approximate ten-year period 2010 to 2020 [39]. The *Health Sector Strategic Plan* ("HSSP") is the primary policy document to operationalize NHP II and the health sector component of the *National Development Plan* [39].

The HSSP provides an overall framework for the health sector; its aim is to guide the implementation of priority interventions that will contribute towards the achievement of MDG targets and the government's goal as stated in the *National Development Plan*, namely, to accelerate economic growth in order to reduce poverty [39]. There have been three such strategic plans; the third and current plan ("HSSP III") covers the period from approximately 2010 to 2015 [39]. It is stated to have been prepared with participation from many stakeholders to ensure their "ownership" of the plan and to harmonize it with other policy initiatives. In the process, various emerging issues are said to have been considered, as well as the international treaties and conventions to which Uganda is a signatory, particularly the MDGs relating to health and numerous international health partnerships [39].

7.2 Policies for Child Health

Uganda's *Constitution* and the *Children Act* provide the legal framework for protection and promotion of child health [40]. The *Poverty Eradication Action Programme* ("PEAP") is the national planning framework to promote economic growth and eradicate poverty; it extends beyond the health sector for broad, multi-sector activities that affect child health [40]. The PEAP targets are similar to the MDGs, especially with regard to women and children [40].

7.2.1 HSSP III and Child Health

The HSSP III defines broad objectives in 16 subject areas and sets out specific targets and strategies to meet those objectives. Child health is one subject area, although many of the strategies in other subjects have a bearing on child health (e.g. nutrition, malaria, and control of communicable diseases). The stated objective for child health is "to scale-up and sustain high,

effective coverage of a priority package of cost-effective child survival interventions in order to reduce under five mortality"[39] (at p. 87).

The HSSP III [39] sets out specific targets to be met by 2015 that include the following:

- The proportion of U5s receiving correct treatment for malaria within 24 hours of onset of symptoms is to be increased from 25% to 85%.
- The proportion of U5s with fever, diarrhoea and pneumonia seeking care within 24 hours of illness is to be increased from 30% to 80%.
- The proportion of U5s with acute diarrhoea receiving ORT is to be increased from 37% to 80%.
- The proportion of sick U5s seen by a health worker according to IMCI guidelines is to be increased from 60% to 100%.
- The proportion of underweight in U5s is to be reduced from 16% to 10%.
- The proportion of stunted children in U5s is to be reduced from 38% to 32%.
- Vitamin A deficiency among children 6-59 months is to be reduced from 20% to 10%.

In order to meet these (and other related) targets with the goal of achieving MDG4, HSSP III emphasizes implementation of the interventions outlined in the Child Survival Strategy, as described below.

7.2.2 Child Survival Strategy

The *Child Survival Strategy for Uganda (2008-2015)* [40] specifies a priority package of interventions that have been recognized in the literature [35, 36, 87-91] as ones that can effectively treat the five major causes of death for U5s, can be feasibly implemented on a national scale, and that, if universally implemented, could reduce U5 mortality by more than 60% [40] (at p. 27). They are as follows:

- Malaria prevention and treatment: insecticide-treated bednets (ITNs), anti-malarials for fever, anti-malarial intermittent preventive treatment in pregnancy (IPT);
- Appropriate treatment of major childhood diseases: ORT, antibiotics for dysentery, ARI-related antibiotics for pneumonia (IMCI is used as a proxy for these interventions);
- Vaccinations for preventable diseases: tuberculosis, diphtheria, tetanus, pertussis (DPT), polio, measles, Hepatitis, *Haemophilus influenzae*, pneumococcal, rotavirus;
- Nutrition interventions: exclusive breastfeeding for 6 months, complementary feeding, integrated management of acute malnutrition, vitamin A supplementation, zinc;

- Newborn health and care: Tetanus toxoid, clean delivery, antibiotics for neonatal sepsis, newborn resuscitation, antenatal steroids, newborn temperature management and/or antibiotics for premature rupture, Nevirapine, and replacement feeding;
- Water and sanitation interventions: clean water, proper sanitation, hygiene improvement;
- Interventions targeted at reducing maternal mortality and lowering fertility: modern contraception, focused ANC, emergency obstetric care.

The delivery mechanisms to be used to achieve universal coverage with these interventions are grouped into three “service delivery modes.” One of these is “family-oriented/community based services” that are to be “delivered on a daily basis by trained Village Health Teams with periodic supervision from skilled health staff” [40] (at p. 8). Phase I of the Strategy was to have coincided with HSSP II, whereas Phase II is to coincide with the current HSSP III (2011-2015). Some interventions (notably ITN for U5s, ORS among others) were to have been scaled up during Phase I while other interventions (e.g. antibiotics for community neonatal pneumonia) are to be scaled up in the current Phase II.

Although there is some overlap between the *Child Survival Strategy* and the *Road Map*, described immediately below, it has been noted that “this overlap should be used as strength to give the enemy of children a decisive blow” [40] (at p. 13).

7.2.3 Road Map for Accelerating Reduction of Maternal and Neonatal Mortality

The *Road Map for Accelerating the Reduction of Maternal and Neonatal Mortality* in Uganda (2006-2015) [92] was developed to help the country achieve MDGs 4 and 5. It has three objectives focusing on service provision, increasing demand for services and prevention of maternal and neonatal mortality. Strategies to achieve these objectives focus on legal framework and policy environment; availability, accessibility and utilization of services; human resources, allocation and distribution of resources, coordination and management, community involvement and participation; and monitoring and evaluation.

7.3 Village Health Teams (“VHTs”)

7.3.1 HSSP III and VHTs

Prompted by the need to meet the MDGs and PEAP targets, the Government of Uganda has chosen to make a concentrated effort towards community empowerment and mobilization for health [16]. Both HSSP I and II promoted community participation in the management of local health services; this was seen as an important strategy to enable communities to take responsibility for their own health and well-being [16, 39]. To that end, two structures were established: the Village Health Team (“VHT”) and the Health Unit Management Committee. It was, however, “(practical) and massive benefits of a sustained universal community empowerment and mobilization intervention,” the *Home Based Management of Fever Program*, and other similar programs (e.g. Guinea worm Eradication), which made it clear that “an all embracing integrated community empowerment and mobilization strategy, the VHT strategy, could indeed be practicable” [16] (at p. 341).

The importance of VHTs to the government's health sector strategy and to the delivery of health care services is implicit throughout the HSSP III document. More explicitly, the first stated objective is to strengthen the national health system and one of the given strategies towards that end is "to establish, train and sustain VHTs in all villages in Uganda" [39] (at p. 46). Reliance on VHTs is either specified or implied in the interventions outlined in several of the subject areas, many of which have relevance for child health, for example, to provide antimalarial drugs for case management at a community level [39] (at p. 69).

Another of the relevant subject areas is the *National Minimum Health Care Package* which includes the following five clusters: (i) Health Promotion, Disease Prevention and Community Health Initiatives; (ii) Maternal and Child Health; (iii) Nutrition; (iv) Prevention, Management and Control of Communicable Diseases; and (v) Prevention, Management and Control of Non-Communicable Diseases [39] (at p. 49). The role and potential value of VHTs in all of these clusters is perhaps self-evident, but it is specified in several instances. For example, "establishment of VHTs at community level to facilitate creation of awareness, community participation and delivery of efficient and effective health interventions at community level" is seen as the "major thrust" towards health promotion and disease prevention [39] (at p. 50).

Implementation particulars are not included; it is noted that to operationalize HSSP III, additional working documents are required [39] (at p. 112). These would include, for example, the *Child Survival Strategy*, described above, and the *VHT Strategy*.

7.3.2 VHT Strategy and Operational Guidelines

Apart from the demonstrated value of VHTs, as noted above, establishment of VHTs is seen by the Government of Uganda as its commitment to the aspirations and principles of the *1978 Alma Ata Declaration* and the *2008 Ouagadougou Declaration on Primary Health Care and Health Systems in Africa*, two keystone declarations that emphasize community involvement in health and health care delivery [10] (at p.7).

The MoH has recently produced its *VHT Strategy and Operational Guidelines* [10] and related documents [93-98]. The Ministry considers the VHT program as different from previous, sometimes parallel, programs that undertook community activities in a vertical manner, which often led to fragmentation, duplication, wasted resources and conflicting messages. To that end, it has stipulated that "the MoH will not allow creation of parallel or competing community structures apart from the VHTs" [10] (at p.5). The intention is to harmonise arrangements so that MoH and its partners approach the communities in an organised fashion.

VHTs are viewed by MoH as the vehicle to engender community participation in health, to link communities to the formal health service delivery system, and to help bridge the gap in human resources, especially in rural areas. The guiding principles for the VHT Strategy are community ownership; equity and access; and community support. The strategy sets out selection criteria, qualities of VHT members, objectives and responsibilities. Provision for coordination of the program is made at district and national levels, with a National Coordination Committee that is responsible for leadership, policy guidance, oversight, technical guidance and mobilization of funding for implementation. Roles and responsibilities are outlined for the various stakeholders,

which include the MoH, local governments, development partners, NGOs, health facilities, local councils, and communities. The document includes an implementation strategy and operational guidelines. It also includes a chapter on motivation and sustainability with suggested incentive mechanisms.

7.3.3 VHT Program

The WHO/GHWA Report [16] conducted several in-depth country case studies, one of which was a review of Uganda's VHT program. The following description of the VHT program is based on that report.

The VHT program begins with a sensitization session in the community; a facilitator from the District Health Office or Health Centre explains the program and the need for volunteers. The selection criteria for volunteers are as follows: maturity (over 18); village resident; literacy in the local language; good community mobilizer and communicator; dependable and trustworthy; interested in health and development; with a demonstrated spirit of volunteerism. Preference is given to those already serving as CHWs.

The intention is to include members on the VHT from different backgrounds (community medicine distributors, extension workers, peer educators, traditional birth attendants, water source committee members, etc.). Training is done so that by the end, every member has acquired skills to handle all of these roles. Training guidelines have been developed by the MoH on technical issues (diagnosis and treatment) and management issues (planning, coordination, and data management).

Trainers are usually drawn from the local health centres and then trained by the District Health Team. Initial training is intended to be 10 days, but this depends on available resources and capacity. Subsequent trainings are needs-based sessions that are conducted at quarterly meetings. The MoH has developed a training module comprised of 9 modules that cover the following topics: VHT concept; communication; community mobilization and empowerment; child growth and development; control of communicable diseases; sexual and reproductive health; environmental health; common non-communicable diseases; and monitoring.

Supervision of VHTs is intended to provide support and guidance, monitor patients in case of adverse reactions, monitor the program, and to provide and track supplies as distributed. VHTs are to be supervised by the local health facility with support from the community.

There is no official provision of a stipend or remuneration. In districts where development partners are participating, some VHTs have been provided with one or more of the following: bicycles, umbrellas, T-Shirts, gumboots and allowances. As these are not usually available in districts where the program is run only by the government, this can create competition.

Insofar as professional advancement is concerned, although no formal certification is provided, some VHTs accumulate experience and then go on to train others. Apparently attrition has been high among young VHTs who get married or leave the village in search of work opportunities elsewhere [16].

As outlined in the MoH's VHT Strategy [10] and related documents [93-98], VHT responsibilities can be summarized as follows:

- Identifying the community's health needs and taking appropriate measures;
- Mobilizing community resources and monitoring utilisation of all resources for their health;
- Mobilizing communities for health interventions such as immunisation, malaria control, sanitation and promoting health seeking behaviour;
- Maintaining a register of members of households and their health status;
- Maintaining birth and death registration;
- Serving as the first link between the community and formal health providers; and
- Community based management of common childhood illnesses including malaria, diarrhoea, and pneumonia; as well as distribution of any health commodities availed from time to time.

As was summarized in the WHO/GHWA Report [16], the (current) primary role of Uganda's VHTs is to prevent disease through health promotion and to refer seriously ill patients to the health facility; they are involved in curative services only in those programs where they have been provided with basic medicines. However, as has been outlined in recent documents, now "the iCCM strategy...is integrated with the MoH's current effort to operationalize the Village Health Team (VHT) concept" [15]. The iCCM strategy (described below) adds treatment to the scope of VHT interventions so that preventive and curative activities will complement each other [15].

7.3.4 Progress on VHT Policy Implementation

The government began to roll out its VHT strategy in 2003, but implementation has been slow. To assist with these efforts, the MoH called for support from development partners [16]. The government's target had been that, by the end of the HSSP II (i.e. 2009), VHTs would have been formed in all the villages in Uganda [39]. The current HSSP III reports that to date, only 50% of the districts have functional VHTs, a lack of funding being cited as a major constraint [39]. HSSP III cites studies indicating that where VHTs are functional, because they effectively manage treatment of minor illnesses, health facilities have become less congested [39] (at p. 29).

7.4 Integrated Management of Childhood Illnesses (IMCI) in Uganda

Uganda's MoH recognizes Integrated Management of Childhood Illness ("IMCI") as "a key strategy for delivery of integrated child health services through improvement of health worker skills in regard to integrated assessment and management of malaria, acute respiratory infections, diarrhoea, and malnutrition, which contribute to over 70% of overall child mortality" [99] (at p. 34). It has been reported that Uganda was one of the first countries to initiate IMCI-based programming, beginning in 1995 [7].

Although comprehensive country-wide IMCI coverage has not yet been achieved, progress is being made. During the period covered by HSSP I (2000/01-2004/05), targeted coverage was not reached because of “piecemeal intervention and a lack of synchronization” [99] (at p. 34). The subsequent plan (HSSP II) emphasized integrated scale up of services at the decentralized level; it set specific targets to increase the proportion of U5s seen by a health worker using IMCI guidelines, those seeking care within 24 hours and receiving oral rehydration therapy [99] (at p. 34). By the end of HSSP II, the proportion of sick U5s seen by health workers using IMCI guidelines had increased to 63% in 2008/09 from 45% in 2004/05 [39] (at p. 12). In the current plan (HSSP III), the target is to increase such coverage from 60% to 100% [39] (at p. 90). Official documents acknowledge that “the existence of policies, strategies and guidelines for the health sector informed by international agreements (such as IMCI among others) constitutes a major strength that MoH and other stakeholders should build on” [39] (at p. 35).

7.5 integrated Community Case Management (iCCM) in Uganda

7.5.1 Overview

A total of 33 million cases of malaria, diarrhoea and pneumonia go untreated in Uganda every year [15] (at p. 6). To address this large “treatment gap,” the Ministry of Health together with its development partners has developed a set of implementation guidelines for integrated Community Case Management (“iCCM”) for the treatment of these three diseases [15]. The iCCM strategy is intended to complement the IMCI-facility based strategy to treat sick children; it is integrated with the MoH’s current effort to operationalize the Village Health Team (VHT) concept and will operate alongside the health system.

VHT members will be trained to deliver and promote *preventive* interventions, such as immunization, hand washing, complementary feeding and insecticide treated nets. The iCCM strategy adds *treatment* by VHT members to the scope of VHT activities so that preventive and curative activities will complement each other [15] (at p. 8).

7.5.2 Program Goals and Objectives

The following description of Uganda’s iCCM program is based on the aforementioned implementation guidelines [15]. The goal of the program is “to reduce childhood morbidity and especially mortality by providing case management for malaria, pneumonia and diarrhoea to sick children within their communities as well as identifying and referring sick newborn babies.” The strategy aims “to increase the correct use of life-saving treatments by making them available, assuring that their delivery is good quality, and mobilizing demand for them” (at p. 9).

The objectives that are to be met by the end of 2015 include the following (at p. 9):

- To increase to at least 80% the proportion of U5s receiving appropriate treatment for malaria, pneumonia and diarrhoea within 24 hours of onset of illness;
- To increase to at least 80% the proportion of children with severe malaria, pneumonia and diarrhoea and newborns with danger signs who are promptly referred by VHT members to health facilities;

- To increase to at least 60% the proportion of VHT members trained on iCCM who have zero stock outs of first line treatment of drugs for malaria, pneumonia and diarrhoea;
- To increase to at least 80% the proportion of trained VHT members with capacity to correctly manage simple cases of malaria, diarrhoea and pneumonia.

7.5.3 Capacity Building

The iCCM strategy “relies on a participatory process to train and support VHTs to deliver curative interventions;” it is viewed as a way to help communities develop their own capacities and also to empower mothers to manage illness (at p. 11). Activities will be conducted at different levels - national, district/HSD, health facility and community.

- At the **national** level, activities include advocacy and mobilization of resources; sensitization and orientation of districts and other stakeholders; design and oversight of rollout plans; building initial capacity for district training and supervision; monitoring, supervision and evaluation; research to guide implementation; ensuring medicines and commodity security; pre-packing and color-coding the drugs for iCCM.
- At the **district** level, activities include sensitizing and guiding communities in selecting VHTs for iCCM; training VHT trainers and supervisors; training public and private health facilities to manage referred cases; medicine and commodity procurement and supply; supervising and monitoring iCCM at lower levels; pharmaco vigilance (monitoring safe of drugs or medicines).
- At **health facilities**, activities include supporting communities to select VHTs for iCCM; managing referred patients; training, supervising and replenishing medicines and supplies for VHTs; managing medicine supply chain; summarizing VHT records; reporting to district level; advocating for iCCM and maintaining good linkage with communities; encouraging caregiver of newborns with danger signs to seek care from the health facility; report adverse drug reactions.
- In **communities**, activities include mobilizing participation in iCCM; selecting VHTs for iCCM; motivating VHTs distributing medicines for iCCM; monitoring distribution of medicines. Activities of the VHTs themselves include treating children and counseling mothers; referring children to health facilities; follow up with children treated; home visits for mothers and newborns; keeping records of patients seen and reporting to the nearest health facility; keeping alert for and reporting adverse medicine reactions.

The MoH plans to build capacity for implementation of iCCM through training at these four levels that will be provided for trainers, supervisors, health worker and VHTs. A team of 24 national masters drawn from technical programs in the MoH will be trained in a 6-day course. These “master trainers” will then train district trainers at the regional level, who in turn will train VHT trainers and supervisors, persons drawn from the health facilities who already have had case management training, through IMCI or otherwise. VHTs will be trained in iCCM during a 6-day course, with 30-35 participants and a trainer/trainee ratio of 1:10. It is expected that training two VHTs in iCCM should suffice for most communities unless they are very dispersed or large. By the end of the course, VHTs should be able to use iCCM job aids to manage sick children; complete VHT registers and reports at the health facility; and liaise and mobilize communities.

Program materials for iCCM have already been developed, including implementation guidelines, facilitators guide, job aids and course certificate [15, 96, 98, 100, 101].

7.5.4 VHT iCCM Program Activities

As described in the implementation guidelines [15], the main components of the iCCM strategy are as follows: VHTs are supplied with a kit of pre-packaged medicines, commodities, and supplies, including diagnostic tools; VHTs mobilize communities to demand, support and use the iCCM program; VHTs treat U5s with fever, cough and diarrhoea and counsel mothers on home care and care seeking; VHTs refer immediately any newborns with danger signs and severely ill children and give pre-referral rectal artesunate; VHTs collect and report iCCM data; VHTs conduct peer supervision; trained health facility staff manage referred cases and supervise VHTs in their catchment area and monitor program progress. The pre-packaged kit for VHTs is to contain medicines for malaria, pneumonia and diarrhoea (including Amoxicillin for non-severe pneumonia, ACTs for uncomplicated malaria, low-osmolarity ORS and zinc for diarrhoea, and rectal artesunate for pre-referral patients), diagnostic commodities (e.g. respiratory timers, MUAC tape) and job aid cards.

7.5.5 Program Components

Interactive and active learning methods are being incorporated into VHT training to stimulate energy, enjoyment, and learning. Interactive methods will include ice-breakers, brainstorming, plenary discussion, small group discussion. Active methods will include practice, role-play, and games. The trained VHT members will be given certificates in a series of ceremonies overseen by the district leaders, equipped with the required drugs and supplies and immediately deployed in sensitized communities.

Community engagement is stressed, it being important that “communities own the iCCM program and support VHTs who have undergone training” (at p. 23). Villages will apply selection criteria to propose VHT candidates for iCCM training, taking into consideration age, literacy levels, and gender, although different districts and sub-districts may choose different criteria.

Incentives: iCCM-trained VHTs are volunteers who are not paid a salary, but they should receive transport refund and safari allowances to attend quarterly meetings. To retain their skills, they must maintain a certain activity level and they need to be motivated to do so. Communities are expected to help motivate the VHTs in delivering this program.

Sustainability: it is recognized that “improving supply chain for iCCM drugs and commodities constitutes one of the most critical aspects for performance and sustainability of the program” (at p. 23). In order to achieve that, certain supply chain management practices will be institutionalized; for example, MoH will work closely with the National Drug Authority to reclassify, pre-package and colour code iCCM medicines; funds for the program will be made available and incorporated into the government’s credit line.

Supervision is regarded as an integral part of the implementation phase of iCCM. The main aim is to provide ongoing support; identify best practices, challenges and coping mechanisms; and to generate information for monitoring and evaluation. For effective supervision, it will be

made an integral component of ongoing activities; for example, at the health facility level, it is suggested that quarterly meetings be conducted for all VHTs in the catchment area, with support from health officials, and an LC representative. These should be supplemented with monthly community visits for at least the first three months after training to identify problems quickly and to coach those with difficulties.

Monitoring and Evaluation have also been addressed in the guidelines (see p. 32).

7.5.6 Progress on iCCM Policy Implementation

As the program is so new, there does not appear to be any published data available on whether any VHTs have been trained in iCCM.

8. COMMUNITY CASE MANAGEMENT – CASE STUDIES

8.1 Multiple Disease Treatment

8.1.1 Integrated Programs - Classification

In the WHO/UNICEF Report [12] that classifies CHW programs, one program type is “CHW integrated multiple disease case management.” In programs of this type (Model 7), CHWs use integrated management to assess and treat sick children having one or more of the diseases or conditions targeted by IMCI. The CCM approach is considered “integrated” if it has the following 5 characteristics: (at p. 13)

- CHWs are trained to systematically detect signs of the major causes of mortality among U5s in the area where they are working;
- CHWs classify the child as having one or more of these conditions using an integrated algorithm or other decision-making tool
- If the area is malarious, the algorithm or tool may take into consideration the clinical overlap of malaria and pneumonia;
- CHWs provide treatment for *all* of the conditions identified, or refer if the child is severely ill or requires a treatment the CHW does not keep in stock;
- CHWs counsel the caregiver of the sick child on how to administer all of the treatments provided.

Under an iCCM approach, as in Uganda, the CHW is required to perform a broader patient assessment than the CHW would for single disease case management alone; in integrated multiple disease case management, the CHW takes a brief symptom history (i.e. as to fever, cough, feeding) and performs a physical examination that includes detection of chest indrawing and determination of respiratory rate, as well as checking for fever and dehydration (i.e. assessment for pneumonia, malaria and dehydration). Integrated CCM training programs are often based on health worker IMCI algorithms and training materials, which are then simplified for use by CHWs. In iCCM, CHWs dispense antimalarials and antibiotics, as well as basic treatments such as ORS and antipyretics. Referral guidelines tend to be more developed and record-keeping is emphasized [12].

8.1.2 Interventions - CCM Case Studies

Not many examples of integrated CCM programs have been studied [12]; this is most likely because the approach is still relatively new. One example is an iCCM program in Kenya, the Community Initiatives for Child Survival in Siaya (CICSS) Project, which was initiated in 1995 [102]. It uses a simplified IMCI algorithm for multiple diseases that enables CHWs to classify and treat malaria, pneumonia and diarrhoea/dehydration concurrently. CHWs are trained for three weeks and assigned to 10 households in their community. Community-based pharmacies serve as resupply points for drug kits. CHWs sell the drugs to community members and use monies from sales to restock their kits with drugs in a revolving fund scheme [12]. An evaluation of the Siaya project found that the CHWs could adequately assess, classify and treat the majority of malaria cases, but they had difficulties managing pneumonia and severe disease. It was hypothesized that the complexity of the treatment algorithms contributed to their difficulties.[12]

Another iCCM program example is Pakistan's National Program for Family Planning and Primary Health Care, which was initiated in 1993. The program employs a cadre of salaried, female Lady Health Workers ("LHWs"); they currently number about 69,000 and cover about 1/5 of Pakistan's population, with each LHW responsible for approximately 1000 individuals. Initial training is three months, followed by one week each month for at least another year. Each CHW is provided with a drug kit and referral forms, and uses WHO case management guidelines to classify pneumonia and treat fever presumptively [12].

In a Malawi program, each community has 2 CHWs who classify and treat malaria, provide ORS and other treatments. CHWs are trained to recognize signs of pneumonia and to refer cases of pneumonia and severe malaria to health facilities [12].

One iCCM program that has been evaluated is a program in the Gambia that centred on the management and treatment of malaria, pneumonia, diarrhoea and malnutrition by CHWs. It found that although child morbidity decreased in the primary health care area, declines were similar in areas without such interventions [12].

8.2 Malaria

8.2.1 Malaria – The Disease

- **Global Situation**

Malaria is a significant cause of U5 mortality; globally, a child dies of malaria every 30 seconds [16]. Approximately 300-500 million episodes of malaria occur each year and result in over a million deaths worldwide. Over 90% of these deaths occur in Africa, and most are deaths of children [103]. Actual numbers are difficult to determine because many children die at home and because of indirect effects of malaria on other infections that result in death [104]. Malaria also contributes to anaemia, a major cause of poor growth and development [16] and leads to high morbidity.

If detected early enough, however, malaria can be treated; if treatment occurs within 24 hours of the onset of symptoms, its impact and the cost of treatment can be significantly reduced [43]. The disease is caused by protozoan parasites belonging to the genus *Plasmodium* [104]. But where laboratory testing is not readily available, in resource-poor rural areas diagnosis is based on clinical signs and symptoms. The most common and earliest symptom is fever and it can be hard to differentiate malarial fever from that caused by other childhood ailments [43].

- **Uganda's Situation**

In Uganda, malaria is one of the major causes of morbidity and mortality; it accounts for 25% to 30% of U5 deaths, or approximately 70,000 to 100,000 deaths every year [40]. Bushenyi District in southwestern Uganda where the within pilot project will take place, is in a location with both endemic and epidemic prone areas. Malaria is a leading cause of illness and deaths in the district, accounting for almost 40% of outpatient attendances [43].

8.2.2 Treatment Options

- **Global Initiatives – Roll Back Malaria**

Malaria can be treated with drugs. In rural communities, immediate treatment at health centres is difficult, however, because by the time the symptoms are recognized as malaria, and a decision is made to make an arduous journey across difficult roads, valuable time is lost. Consequently, the international health community has looked to another option, which is to train CWHs in the application of first line anti-malarial drugs [43]. The *Roll Back Malaria* (“RBM”) movement was launched in 1998 by WHO, UNICEF, UNDP and the World Bank; two years later, several African heads of state committed their governments to halve the malaria mortality for Africa’s people by 2010, through implementing RBM strategies [103]. RBM has been described as an effort “to generate a dynamic societal movement” and to encourage communities “to take individual and collective actions to prevent and control malaria” [103].

- **Uganda's Efforts - RBM and Home Based Management of Fever**

In Uganda, malaria control strategies as stipulated by the RBM Initiative as well as a WHO strategy of fever management have been embedded into the Ministry of Health’s national control program¹³ [43]. This program includes various prevention strategies, such as promotion of the use of insecticide-treated bed nets and indoor residual spraying, as well as early and effective case management [39]. Specifically as regards U5s, the program promotes adequate and timely treatment of any child presenting with febrile illness in malaria endemic areas, protection of children at night or when sleeping using bed nets, and indoor residual spraying [43]. Malaria treatment is free of charge at government health facilities [43].

Uganda’s national malaria policy includes the program for *Home Based Management of Fever* (“HBMF”) [39]. Under this program, two volunteer drug distributors (“DDs”) are recruited from each village and then trained for 3 days in drug distribution, counselling caregivers on the signs

¹³ Due to time constraints, it has not been possible to refer to the source documents for Uganda’s “national malaria control program” and “national malaria policy” to determine whether they are the same or complimentary policies.

of malaria, drug dosage and administration. The DDs distribute pre-packed antimalarials free of charge in age-specific doses (called Homapaks), assess the need for treatment and refer children with persisting fever or danger signs to the health centre [12]. As of 2004, the HBMF program covered 10 of Uganda's 30 districts, with partial coverage in another 5 districts [12].

It has been pointed out that HBMF has its limitations, due to ineffective drugs or poor treatment adherence [43]. Although HBMF accounts for up to 40-60% of treatment, evidence is limited as to the effects it has had on large-scale implementation and its role in the broader health system [11]. Moreover, it has been noted that, as the cost-effectiveness of HBMF varies substantially with malaria transmission intensity, while it may be useful in settings with higher transmission and limited health care and diagnosis, it is not appropriate for all settings [105].

Official government documents report that progress is being made; between 2004 and 2008, the proportion of children with malaria who received effective treatment within 24 hours after the onset of symptoms increased from 25% to 71% [39] (at p. 16). Progress is hampered, however, by several challenges, including inadequate procurement and delayed delivery of antimalarials; inadequate trained health workers in health facilities; and weak laboratory infrastructure for malaria diagnosis [39]. In 2004 Uganda switched to a new first-line drug (from SP Fansidar to artemether-lumefantrine, or Coartem); consequently, due to concerns over cost, limited supply and possible drug resistance, it is possible that distribution of the new antimalarial is being limited to health facilities [12].

Under the current strategic plan (HSSP III), the focus is on “a rapid scale up” and an enabling environment for implementation of interventions. “There will be deliberate efforts to implement a comprehensive policy on malaria diagnostics and treatment, strengthen the procurement and delivery of malaria commodities, and strengthen RBM coordination mechanisms as well as M&E and general health systems.” The goal is, by 2015, to halt and begin to reverse the incidence of malaria in Uganda and thereby minimise the attributable social effects and economic losses [39].

8.2.3 Malaria and Pneumonia Symptom Overlap

In most countries in sub-Saharan Africa, malaria and pneumonia together account for about half of all child mortality and exhibit a great degree of overlap in their clinical presentation [12]. For example, in a study at 14 health centres in Uganda, it was found that 30% of U5s had symptoms compatible both with malaria and pneumonia; of all malaria cases, 37% also had pneumonia [106].

However, most programs follow an intervention model where CHWs assess and presumptively treat sick children for malaria only. This ignores the substantial overlap in the clinical presentation of malaria and pneumonia and puts the caregiver in the position of needing to make a presumptive diagnosis of either disease. If a child sick with pneumonia or concomitant pneumonia and malaria is treated solely with an antimalaria, this can precipitate delays in proper treatment of both illnesses [6, 12, 86].

Under the IMCI algorithm, “malaria” in high-risk settings is defined as presence or history of fever, a symptom which also occurs in children with pneumonia. Under IMCI, “pneumonia” is defined as cough or difficult breathing with fast breathing, symptoms that may also indicate malaria [106]. Algorithms that attempt to differentiate malaria from other causes for fever in U5s using clinical features alone “have not proved sensitive or specific enough;” consequently, it has been recommended that, in areas where malaria is endemic but parasitological diagnosis cannot be undertaken, children with fever be given antimalaria treatment according to IMCI guidelines, even if another diagnosis such as pneumonia is likely [104].

In the WHO/UNICEF Report [12], an integrated CCM approach is recommended “if national policy allows both antibiotics and antimalarials to be provided by CHWs, and safe and inexpensive antimalarials are still effective.” Integrated CCM programs are not as feasible where more expensive combination therapy is being used and drugs are only available at health facilities (in which circumstances “facilitated referral” by CHWs may be more appropriate).

8.2.4 Malaria Interventions - CCM Case Studies (Global)

The literature describes programs that promote “home treatment” and “community-based treatment” of malaria, but there is no standardization of these terms [12]. Moreover, although malaria studies abound, many of them do not have comparison groups and even fewer are “randomized,” making it difficult to draw inferences about community-based malaria treatment. It has been noted that “the impact of community-based treatment of malaria has been widely studied in sub-Saharan Africa without conclusive results” [12] (at p. 4).

In the WHO/GHWA Report [16], an extensive review was conducted of CHW studies categorized according to disease type. It examined 29 studies that involved malaria control interventions and 8 country programs. In the malaria control studies, the role of the CHWs was to promote the use of bed nets and provide treatment for uncomplicated malaria. In the 8 country studies, the main role of CHWs was counselling and referral for bed nets, Intermittent Preventative Treatment of pregnant women and rapid diagnostic tests. In most of the malaria control studies (21 of 29), the CHWs were community residents; in some cases all were literate, while others included both literate and illiterate individuals. Some programs used a didactic training method and some used a combination of didactic training with a practicum. In those programs with refresher trainings, reviewers found that this did have a positive impact on outcomes as compared to programs without refreshers. Supervision was also found to be an important factor; reviewers concluded that “(malaria prevention) interventions...have shown positive outcomes especially in studies with regular supervision” [16] (at p.125). A major limitation in many programs was frequent shortages of nets and drugs. Reviewers concluded that key problems revolved around the limited scope of the CHW practice and their ambiguous role within the health system.

The WHO/UNICEF Report [12] found that “programs employing the presumptive treatment of malaria by CHWs can increase the number of patients receiving treatment, increase the correct administration of drug regimens in the home, and decrease malaria morbidity and parasitological indices” (at p. 10).

The following is a summary of some key findings from the literature, based largely on the WHO/GHWA report [16], followed by a description of some of the major case studies; additional studies are included in Appendix B.

The WHO/GHWA Report [16] summarized that most interventions are those where CHWs have been trained to treat uncomplicated malaria with Chloroquine; in one program, CHWs distributed Chloroquine free of charge in all fever cases. In some programs, CHWs have been given additional training, for example, to take samples, to refer cases where fever has persisted for 3 days, to check haemoglobin, and to conduct laboratory diagnosis. A program/study was conducted where CHWs were unpaid, but provided free medical services at government hospitals. Their role was to provide education on malaria prevention, make blood smears, offer presumptive treatment and maintain patient records. They identified 9% and 47% of malaria cases in Thailand and Latin America, respectively. In another program/study in Ecuador, Colombia and Nicaragua, CHWs received initial training to diagnose and treat uncomplicated malaria and then refresher workshops once a month. It was found that in the group that had received refresher training, knowledge of malaria had increased, as compared to the control group.

A randomised trial was conducted in Tigray Ethiopia, where peer counsellors helped mothers recognize and treat symptoms of malaria and recognize adverse effects of treatment. The result was a 40% reduction in U5 mortality in the intervention communities. Researchers concluded that “a major reduction in U5 mortality can be achieved in holoendemic malaria areas through training local mother coordinators to teach mothers to give under-5 children antimalarial drugs” [107].

In southern Mali, more than 300 villages were given village drug kits. The kit “manager” (i.e. CHW) received 35 days of literacy training followed by 1 week of training in drug-kit management; antimalarial treatment was given presumptively. An evaluation of this program found that the drug kits were successful in increasing availability of antimalarials at the village level, however, there were concerns over treatment of children with ARI or severe malaria. To address these and other deficiencies, additional training was given and a referral system was introduced. This resulted in improved rates of referral; 42% for children in the intervention compared with 11% in the control group [12].

A program in Burkina Faso promotes treatment of uncomplicated malaria with pre-packaged drugs at the household level. Caregivers and CHWs are trained in symptom classification using a simple algorithm based on the presence of fever and absence of danger signs. Caregivers diagnose malaria presumptively and severe cases are referred. CHWs sell pre-packaged Chloroquine under a cost-recovery scheme with a 10% incentive margin. Health centre nurses conduct the training and supervision [12]. An evaluation of the program concluded that “CHWs played an important role; the use of drugs was highly correlated to the number of CHWs per population” [12] (at p. 52).

In the Democratic Republic of the Congo, between 1985 and 1987, CHWs treated approximately 65% of community cases of malaria, which contributed to a 50% decline in malaria morbidity compared to control areas [59] (at p. 56, citing [50]).

8.2.5 Malaria Interventions - CCM Case Studies (Uganda)

An evaluation of Uganda's HBMF program in 2004 found that children in the program areas were "five times more likely to receive an appropriate antimalarial than children in comparison districts"[12].

Another assessment of the HBMF program was conducted in 2004, as to overall referral rate, causes of referral, referral completion and reasons for non-completion. It found the overall referral rate was 8%, with fever being the main reason that caregivers sought out DDs and why DDs gave referrals. Of "urgent referrals," 93% of caregivers did access referral care but 31% delayed for more than 24 hours, usually waiting for completion of antimalarials. Researchers concluded that the HBMF program "has high referral compliance and extends primary health care to the communities by maintaining linkages with formal health services" [108].

Another study assessed the HBMF program as to improvements in the accumulated proportion of patients treated, those treated within 24 hours of illness onset, and those treated with the recommended antimalarials at an adequate dosage and for the correct duration. It was found that, combined with the antimalarial drug efficacy, the program resulted in a 10.4% improvement in the community effectiveness of malaria treatment [11].

In one study in western Uganda, Focus Group Discussions were held with child caretakers in three rural communities to explore local understanding and treatment practices for childhood fever illnesses and discuss implications for the HBMF strategy. Researchers found that Homapaks (i.e. antimalarials) are likely to be used only where "western" treatment is perceived as appropriate; thus, delayed and undertreatment of potential malaria are expected to continue. They concluded that HBMF strategies need to address local perceptions of febrile illness and adapt materials accordingly [109].

(For Additional Malaria CCM Case Studies, see Appendix B)

8.3 Acute Respiratory Illness ("ARI")/Pneumonia¹⁴

8.3.1 The Disease

- **Global Situation**

ARIs are among the top causes of mortality among children under five; approximately 2 million children die from pneumonia every year [35, 37, 110, 111].

- **Uganda Situation**

In Uganda, ARIs are among the major causes of morbidity and mortality of children under five. According to the government's 2006 health survey, 45.1% of U5s had symptoms of ARI/fever in the two weeks preceding the survey [40].

¹⁴ The term "ARI" can include pneumonia, but not all ARIs are pneumonia; therefore, because these terms are not interchangeable, the term that was used in the source document is used in this section.

8.3.2 Treatment Options

When children suffering from pneumonia are treated promptly and effectively with antibiotics their chances of survival increase significantly [111]. Newer vaccines against pneumonia do exist, but are not widely available in developing countries and target only a limited spectrum of causes [111]. Since many sick children in developing countries do not reach health facilities, treatment needs to be brought closer to the sick children [111].

Treatment of pneumonia with antibiotics by CHWs, however, is relatively uncommon, especially in Africa [12]. This is partly due to a prevailing belief that only health professionals at a health facility should treat pneumonia; concerns being possible misuse of antimicrobials and increased drug resistance [110]. When ARIs are treated by CHWs trained in IMCI algorithms, however, it has been found that this can actually reduce the improper use of antibiotics for cough and cold and increase their proper use [110] (citing [85]).

CCM of ARIs requires that CHWs be supervised and that quality of care is monitored [110, 111]. CHWs can be trained to use algorithms to assess danger signs in children with a cough, count respiratory rates, and look for chest in-drawing to classify respiratory illness; they can be trained to recommend and dispense oral antibiotics for cases classified as simple pneumonia and to refer young infants or children with danger signs or chest in-drawing to health facilities [110, 111]. As studies have demonstrated, CHWs have the ability to classify pneumonia [55], they can manage ARI/pneumonia effectively, and they can prescribe antibiotics appropriately [112-114] with few exceptions [102] (cited in [110]).

Successful CCM of ARIs requires knowledge of the community, adequate training of CHWs, supervision, close links with functional health centres and adequate drug supplies. It also requires national policies that support CCM of ARIs by CHWs, that authorize the use of appropriate antibiotics in the community, and that reinforce the link between CHWs and health facilities [111].

In order to increase coverage, as CCM for ARIs is introduced and scaled up, existing facility-based health care must be expanded and reinforced [110]. As WHO and UNICEF have stated jointly, “community-level treatment of pneumonia can be widely implemented and is sustainable;” they recommend that “community-level treatment [of ARIs/pneumonia] be carried out by well-trained and supervised CHWs” [111].

8.3.3 Interventions - CCM Case Studies

In the WHO/UNICEF Report [12], one of the CHW program models is where CHWs assess the signs of ARI and treat with antibiotics if there are signs of pneumonia. The authors find that this program type has the strongest evidence for its impact on mortality [115] as well as a record of success in scaling up. Case studies in CCM of ARI/pneumonia are almost exclusively from Asia; there are few studies from Africa.

A meta-analysis of nine community-based studies on the effect of CCM of pneumonia on mortality in neonates, infants, and preschool children found reduced overall mortality in children

0–4 years by 24% and pneumonia-specific mortality in children 0–4 years by 36% [6, 110, 111] (citing [115]).

In Indonesia, a community-based program involving health education by CHWs was found to increase care-seeking for pneumonia from health facilities [12]. A study from Thailand offers similar evidence. Evaluation of a community-based programme in Bangladesh provides some evidence that active case detection and referral by CHWs can have a beneficial effect on pneumonia mortality [12].

Studies have been undertaken in Nepal since the 1980s [114]. Early research at that time determined that pneumonia case management by community-based workers decreased under-five mortality by 28%. Community-based management of pneumonia doubled the total number of cases treated compared with districts with facility-based treatment only. Over half of the cases were treated by female CHWs. The programme was phased in over 14 years and now 69% of Nepal's under-five population has access to pneumonia treatment [63]. What that study found was that the uninterrupted supply of antibiotics, timers and recording forms is essential to maintaining credibility of CHWs in the community. Supportive supervision and review meetings are key to assuring quality of care, maintaining motivation, and providing on-the-job refresher training [63].

A well-known and longstanding CHW project was undertaken in Gadchiroli, India. Early on during the study it was found that illiteracy among CHWs necessitated special training and supervision; they made many errors initially, but this was reduced with continued education and corrective supervision. Their inability to count up to 50 prevented some CHWs from using the respiratory rate as the main diagnostic criterion. Successful management of pneumonia greatly increased credibility of CHWs and the project offered them dignity and respect [116].

In rural Bangladesh, a targeted programme designed to treat children with ARI was implemented in 1988 in a primary health care project. The findings suggest that the combination of specific and nonspecific interventions can reduce ARI mortality by as much as 50% and the overall mortality among under-5-year-olds by as much as 30% [117].

The WHO/UNICEF joint statement has references to additional studies of programs in the Gambia, Siyena Kenya, Honduras, Nepal and Pakistan.

(For Additional ARI/Pneumonia CCM Case Studies, see Appendix B)

8.4 Diarrhoea

8.4.1 The Disease

- **Global Situation**

The annual mortality rate for children under five suffering from acute diarrhoea is still over 1.5 million as of 2002 [118]. The causes of diarrhoea are many, including intestinal infections, food allergies and malnutrition [119].

- **Uganda Situation**

In Uganda, diarrhoea is a major cause of childhood morbidity and mortality. According to the most recent health survey, 25.8% of under-fives had diarrhoea in the two weeks preceding the survey [40].

8.4.2 Treatment Options

Oral rehydration salts (“ORS”), also known as oral rehydration therapy (“ORT”), as adopted by UNICEF and WHO in the late 1970s, were successful in managing diarrhoea among children. Now, two recent advances are being promoted: newly formulated ORS containing lower concentrations of glucose and salt, and success in using zinc supplementation [118]. These new methods, when used in addition to prevention and treatment of dehydration with appropriate fluids, breastfeeding, continued feeding and selective use of antibiotics, will reduce the duration and severity of diarrhoeal episodes and lower their incidence [118]. This is especially important, given indications in some countries that knowledge and use of appropriate home therapies to successfully manage diarrhoea may be declining [118]. “Families and communities are key to achieving the goals set for managing the disease by making the new recommendations routine practice in the home and health facility” [118].

8.4.3 Interventions – CCM Case Studies

In the WHO/UNICEF Report [12], reviewers pointed out that they did not systematically identify programs that train CHWs to assess and treat children with diarrhoea. Few programmes train CHWs to identify signs of severe dehydration or dysentery [57]. However, recommendations in the recent WHO/UNICEF policy statement on management of diarrhoea in children [118] could be integrated in different ways into all types of CHW intervention models [12].

One case study was found from Karachi, Pakistan, where CHWs provided weekly education to households on proper handwashing in squatter camps. Between 2002 and 2003, there was a 53% lower incidence of diarrhoea among intervention neighbourhoods than in control neighbourhoods [59].

(For Additional Diarrhoea CCM Case Studies, see Appendix B)

8.5 Severe Acute Malnutrition

8.5.1 The Disease

- **Global Situation**

It is estimated that there are nearly 20 million children who are severely acutely malnourished and that about 1 million die every year; most of them are in south Asia and in sub-Saharan Africa [120]. Severe acute malnutrition can be a direct cause, or contribute indirectly when children are also suffering from diarrhoea and pneumonia [120].

Severe acute malnutrition is defined by a very low weight for height, by visible severe wasting, or by the presence of nutritional oedema. In children aged 6–59 months, an arm circumference less than 110 mm is also indicative of severe acute malnutrition [120]. One out of every four U5s in the developing world is underweight and at increased risk of an early death [16]. Moreover,

malnutrition during childhood can have serious lifelong effects on the health of the individual [16].

- **Uganda Situation**

In Uganda, malnutrition is strongly associated with U5 mortality and accounting up to 60% of deaths. According to the most recent health survey (2006), 38.1% of U5s are stunted, with 15.0% being severely stunted; 6.1% being wasted; and 15.9% being underweight [40]. Apparently these figures have not changed much over the past 15 years [39].

8.5.2 Treatment Options

Few countries have any national policy to detect and treat severe acute malnutrition, possibly because until recently there was no clearly effective treatment strategy and treatment was restricted to the facility-based approach [121]. New evidence suggests, however, that large numbers of children with severe acute malnutrition can be treated in their communities; the community-based approach involves timely detection by CHWs who have been trained to use strips to measure mid-upper arm circumference (“MUAC”) and to identify nutritional oedema [121]. Children so identified must then be assessed to determine whether to treat within the community or refer to health facilities [120]. Early detection makes it possible to start treatment before the onset of life threatening complications. Evidence shows that about 80 per cent of children with severe acute malnutrition who have been identified can be treated at home with ready-to-use therapeutic foods or other nutrient-dense foods [120]. “If properly combined with a facility-based approach for those malnourished children with medical complications and implemented on a large scale, community-based management of severe acute malnutrition could prevent the deaths of hundreds of thousands of children” [120].

In addition, there are other justifications for establishing community-based management of severe malnutrition within routine health systems. CCM could benefit children by reducing exposure to hospital-acquired infections and providing continuity of care after discharge; it could benefit families by reducing the time caregivers spend away from home; it could benefit the health system through capacity-building, closer integration of curative and preventive services and through lower costs if fewer cases are referred to hospitals [122]. Strong community participation and active screening linked to health service provision at the local level is paramount for sustainable assessment and referral of severe acute malnutrition [123].

WHO and UNICEF have recommended national policies and programs that provide, inter alia, training and support for CHWs to identify children with severe acute malnutrition and training to improve management of severe acute malnutrition at all levels using an integrated approach that includes community- and facility-based components [120].

8.5.3 Interventions – CCM Case Studies

In the WHO/GHWA Report [16], nine studies involved interventions for malnutrition. Although the role of CHWs in these cases was “promotive in nature,” the reviewers concluded that “simple promotive interventions lead to create an impact on the nutritional status of children” (at p. 50).

A review was conducted of 33 studies of community-based management programs under four types of delivery systems (day-care nutrition centres, residential nutrition centres, primary health clinics, and domiciliary rehabilitation) for the period 1980–2005 [122]. Effectiveness was defined as mortality of less than 5% and an average weight gain of at least 5 g/kg/day. Eleven (33%) programs were considered effective and of the subsample of programs reported since 1995, 8 of 13 (62%) were effective. None of the programs operating within routine health systems without external assistance was effective. Reviewers concluded, however, that “with careful planning and resources, all four delivery systems can be effective” [122] (at p. S46). It is unlikely that a single system would suit all situations, (but) “(w)here children have access to a functioning primary health-care system and can be monitored, the rehabilitation phase of treatment of severe malnutrition should take place in the community rather than in hospital” [122] (at p. S46).

Community-based therapeutic care (“CTC”) is a new approach for the management and treatment of severe acute malnutrition; until 2001, emergency response to high levels of acute malnutrition was predominantly through therapeutic feeding centers [121]. A review was conducted of 21 such CTC programs that had been implemented between 2000 and 2005 in Malawi, Ethiopia and North and South Sudan [123]. These programs, which had coverage of approximately 73%, achieved recovery rates of 79.4% and mortality rates of 4.1%. Of the severely malnourished children who presented, 76% were treated solely as outpatients. Based on initial data, reviewers concluded that these programs are affordable.

(For Additional Malnutrition CCM Case Studies, see Appendix B)

9. Application of New Technologies

Several challenges lie ahead in scaling up iCCM interventions in the developing world, which include a scarcity of health care professionals, limitations in the healthcare system, and poor transportation infrastructure, particularly in rural areas. Mobile devices have the potential to address these limiting factors. They can facilitate instant and frequent communication between CHWs in remote communities and professional health staff, thereby acting as a useful aid in task shifting. This can increase access of CHWs to trained staff in central locations, reduce the need for supervisors to travel to outlying areas, reduce the costs and time involved in such travel. Use of mobile technology is still in its infancy, but there are a few reported studies.

One study in southwestern Uganda looked at the use of portable phones among smallholder farmers to link them with market outlets and other service providers who contribute towards agricultural productivity [124]. Research findings showed that the phone was appreciated by rural communities as an easy, fast and convenient way to communicate and get prompt answers to problems. Use of phones in the study area was accompanied by other positive outcomes, such as emerging strong collective action among social groups with farmers coming together to market their produce [124].

A pilot program was conducted in 2006 in Uganda, in which CHWs were trained in mobile phone use to monitor patients in a rural ART program. Phones were used to send text messages containing clinical data to higher trained providers for review and triage and to make

calls to a central clinic for guidance on illnesses, urgent care needs, and concerns about drug side effects. Survey results from clinical staff indicated that 44% strongly agreed and 56% agreed that the intervention had improved the overall health of patients. “The mobile phones allowed us to use local technology to improve communications between (CHWs) and higher level providers in a rural setting with poor transport infrastructure” [125].

In a project in Malawi, a group of 75 CHWs were supplied with cell phones and trained to utilize the network for a variety of usage cases, including patient adherence reporting, appointment reminders, and physician queries. At the end of the pilot, the hospital had saved approximately 2,048 hours of worker time, \$2,750 in net fuel savings, and had doubled the capacity of the tuberculosis treatment program. Although this was a retrospective observational study, and therefore subject to several caveats, it was noted that the majority of CHWs had never used a cell phone but had adapted to the technological demands within hours and that local staff “took complete ownership of project within two weeks” [126].

Another pilot project was conducted in 2008 in Kenya where treatment supporters were asked to take daily videos of the patient swallowing their medications. Patients submitted the videos for review by the health professionals and were asked to view motivational and educational text messages. It was found that “both patients and health professionals appear empowered by the ability to communicate with each other and appear receptive to remote mobile direct observation of treatment (MDOT)” [127].

10. TOPICS FOR FURTHER RESEARCH

10.1 Research Gaps in CHW Programs

Research gaps remain in the community health worker literature; at the same time, as new treatment approaches are emerging, such as integrated community case management, research gaps in iCCM are becoming evident there as well. Although there is inevitably some overlap, this section offers a summary of topics for which additional research has been suggested, on CHW programs generally, followed by research on iCCM more specifically.

Context Specific Studies:

- Most large CHW studies have been from south Asia; there are few studies from Africa [6, 18].

Effectiveness:

- CHW effectiveness trials are needed, tailored to local health needs & circumstances [18].
- Assessments are required as to whether programs promote equity and access [16].
- Studies are needed to compare the effectiveness of paid CHWs and volunteers [16].
- Evaluations of the quality of care provided by CHWs as compared with professional health workers are required in the fields of health education, promotion and management of specific health problems [16].
- Effectiveness of CHWs serving in a “health promotion-only” role has not been well established, despite potential cost and sustainability benefits [16].

- Investigation is needed into the potential impacts of expanding the practice scope of CHWs to include curative care (effect on retention, outcomes, etc.) [9].
- Research is needed on “whether promotion by CHWs of care-seeking from health facilities, combined with verbal referral and, in some CHW programs, active case detection, is effective in increasing the proportion of children requiring antimicrobial treatment who receive an appropriate course of treatment from a health facility” [12] (at p. 7).
- More research is needed on the effectiveness of behaviour change packages at the household level and on which type of CHWs are best able to provide community-level interventions that promote maternal, perinatal and neonatal health [18].

Supervision:

- Supervision of CHWs is insufficiently described and analyzed in the literature [16]. Despite recognition of its importance, there is little evidence to show how much and how often supervision is required, and how other forms of community and peer support can help improve CHW performance [7].

Retention and Motivation:

- Relatively few published studies report CHW retention, especially amongst volunteers.
- More information is needed on how to retain CHWs once they have been trained [18, 21] and how can they be retained over longer periods [9].
- Volunteerism in developing countries is poorly understood; few studies have looked at how monetary and non-monetary incentives influence CHW retention and motivation [7].
- Studies could consider how communities can participate in CHW program evaluation and how that participation affects motivation, retention and effectiveness [59].
- Research is warranted on the positive association between characteristics of CHWs (marital status, education and gender) on retention, motivation and effectiveness; and whether or not a balanced representation between male and female CHWs improves effectiveness [59].
- Research into the length and frequency of CHW training that is required to retain skills and motivation would help improve program design and implementation [59].

Scaling Up:

- Research is required on how CHW programs can be integrated into existing government health systems [6, 12, 18].
- Similarly, research is needed on how CHW programs can be effectively scaled up to become national programs [6, 9, 16].
- Analysis is required on the volume of work, type of work, and the number of CHWs needed to complete different tasks; results thereof would help to determine the size of CHW workforce required and their functional needs [16].

Program Sustainability:

- Further research is needed to determine the factors that affect the sustainability of CHW programs [16]; specifically, by examining examples of reliable, sustainable volunteer CHW programs that already exist (e.g. in Nepal and Nicaragua) and determining whether there are lessons that can be transferred to other settings [5] (at p. 222).
- Community ownership is insufficiently described and analyzed in the literature [16].

Cost:

- The cost effectiveness of CHW programs, particularly for different health issues, is an area of further study [16, 18].

Monitoring & Evaluation:

- There is a need to involve communities in CHW monitoring, evaluation & research [18].
- Few evaluations of CHW programs have been conducted at scale and “none (have) followed an a-priori experimental design or impact assessment process” [16] (at p. 38).

Other Research Areas:

Reliable data on births, deaths, and causes of deaths is required in order to target disease control programs and primary health care services. Data gaps and inadequate vital registration systems is most acute in those countries with the highest mortality and least resources, particularly in sub-Saharan Africa [38]. Research could be conducted to assess whether CHWs can be enlisted to effectively track births and deaths in such areas [9].

The WHO/UNICEF report that classified CHW programs found very little evidence for “Model 2” (programs where CHWs provide basic management and facilitated referral); research is said to be “urgently needed... (on) how facilitated referral can be made to work” [12] (at p. 15).

Other Research Considerations:

Due to inadequate funding, shortage of human resources and inadequate logistics, CHW research is largely donor driven. Dissemination of research results and translating those results into effective policy remains a challenge for governments [39]. Lessons can be learned from both successful and unsuccessful CHW programs, therefore, publication of failed interventions should also be encouraged [18]. Lastly, is the need for carefully designed CHW research; in one study in Gambia, although child morbidity had reduced in the intervention area, there had also been reductions in the control areas [6].

10.2 Research Gaps in Community Case Management

As CCM and iCCM programs are being rolled out, areas for further research are already becoming apparent. Some topics that overlap with research needed on CHW programming generally, if already mentioned above, are not repeated below. Some topics overlap, however, the research being suggested is from a perspective that is unique to CCM; those suggestions, as well as research topics specific to CCM, include the following:

Effectiveness, particularly at scale:

- There are “few high-quality studies of the effectiveness of *integrated* [CCM] programs” and more of those studies are needed, “particularly using stronger research methodologies for programs at scale” [18] (at p. 15).
- “There is a notable lack of studies of [CCM] interventions in routine field settings at scale over longer periods of time, and a notable lack of studies of both types – short term in highly controlled field settings and long-term in more routine settings – of combinations of interventions (so-called “packages”) and of programs providing more comprehensive services” [18] (at p. 20).
- Assessing the effectiveness of combinations of [CCM] interventions at scale requires new methods to determine: whether the interventions reach those for whom they were intended at an acceptable level of quality; whether there is evidence that child health improved; and whether those improvements in child health can be attributed to the interventions [18].
- For [CCM] interventions with strong evidence of effectiveness, now the challenge is to implement these at scale, with “rigorous external and independent assessment” [18] (at p. v).
- Given the evidence that strengthening community-based primary health care (CBPHC) is required to achieve the MDG for child health, what is needed are more field sites that can test different versions of CBPHC at scale [18] (at p. 29).

Training Methods:

- Although hands-on clinical training is highly beneficial, it can be costly to bring CHWs to a large facility. Research could be conducted into the use and adequacy of videos, role-plays, and other teaching methods, which could include cost-benefit analysis of these alternate methods [5].

Role of New Technologies:

- Various new technologies could be applied for use in CCM, including Rapid Diagnostic Tools and mobile devices, such as cell phones and handheld computers. Research could be conducted to consider their suitability (for example, as job aids and communication aids for referral or consultation), especially as costs decrease [5].

Cost effectiveness:

- Because CCM targets hard-to-reach areas that typically have high mortality rates, the strategy may be more costly per capita; however, the beneficial effect may be greater, yielding a favourable cost-effectiveness ratio. This requires some study [5] (at p. 7).
- Research into the cost effectiveness of iCCM is important, given the limited resources of many countries. The feasibility of some of the technologies for iCCM implementation also need more of a local evidence base [15].

Disease-Specific Research:

- Further evidence is required in a variety of field settings on community-based rehabilitation of children with protein-calorie malnutrition “through the Positive Deviance/Hearth approach” [18].
- Similarly, such evidence is required on reduction of household smoke by placement of improved cooking stoves (to reduce childhood pneumonia) [18] (at p. iii).
- There is a need for case studies & country examples based on the iCCM Framework [4].
- “Few publications address process assessment of breastfeeding and nutrition promotion, integrated child health, or programs for MNCH. For example, UNICEF’s high profile Accelerated Child Survival Programme for implementing the C-IMCI strategy in several African countries has not been rigorously assessed externally for impact on mortality”[6] (at p. 2124).

Program Design:

- Research is needed to address how CCM for newborns and children is best integrated and whether it is best to add newborn CCM to a child CCM platform or vice versa [5].
- It is necessary to consider how curative interventions can be delivered to communities that are so remote from facilities that could serve as a base for CCM that the necessary ongoing support and supervision of CHWs is not feasible [5].
- Research is required on ways to strengthen the formal health system to support interventions that cannot be carried out in the community without commodities and technical support, such as iCCM of childhood pneumonia and malaria [18].
- As epidemiology evolves, with a changing disease panorama, CHWs may be expected to take on responsibilities other than those of CCM. This may have a negative effect on CCM and its design [5].

Research Design:

- Standardization of terminology could facilitate comparison of CHW CCM programs and outcomes. For example, “home treatment” and “community-based treatment” are not defined and the differences are blurred in much of the documentation [12] (at p. 14).

Evaluation:

- Better methods are required for conducting evaluative community-based research; these would include alternative methods (mixed methods, case methods, realistic evaluation) and methods that more accurately measure the effect of complex interventions in challenging settings. [128-130].

11. Conclusions

The HCU pilot study of iCCM is timely and appropriate. To a large extent, it has been designed and driven by local stakeholders with local expertise and regular input from Ugandan policy-makers. Study questions seek to address important research gaps that have been identified in the literature as critical to effective iCCM undertaken by CHWs. It is anticipated that outcomes of this research will be directly applicable to the expanded scope of responsibilities of VHTs in Uganda in the implementation of iCCM for the management of major childhood illness and could thereby contribute significantly towards better child survival.

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APPENDIX A

SEARCH STRATEGY

Search A

Search Terms: (see PDF A1) (to follow)

Databases:

MEDLINE (1950 - present) 1476 results	EMBASE (1980 - present) 1109 results	CINAHL (1981 - present) 1522 results	Global Health (1910 - present) 643 results
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Search A1

Search Terms: (as above)

Data Bases: (as above, date range limited: January 1, 2009 to October 14, 2010)

MEDLINE (01/01/09 – 10/14/10) 115 results	EMBASE (01/01/09 – 10/14/10) 152 results	CINAHL (01/01/09 – 10/14/10) 259 results	Global Health (01/01/09 – 10/14/10) 82 results
TOTAL REFERENCES 608 results			
AFTER DEDUPLICATION 405 results			

Search B (run on Nov 21)

Search Terms:

OUTCOMES	INTERVENTIONS	COUNTRIES
(child\$ adj5 health\$.ti.ab exp Infant Mortality/ exp Child Mortality/ (child\$ adj5 mortality).ti,ab (infant\$ adj5 mortality).ti,ab Exp Pregnancy Outcome (pregnan\$ adj5 outcome\$.ti,ab	exp Prenatal Care/ exp Community Health Aides/ community health aid\$.ti,ab community health worker\$.ti,ab lady health worker\$.ti,ab village health worker\$.ti,ab community based intervention\$.ti,ab female village health worker\$.ti,ab village health volunteer\$.ti,ab village health guide\$.ti,ab lay health worker\$.ti,ab mid level health worker\$.ti,ab community health volunteer\$.ti,ab primary health care.ti,ab exp Primary Health Care/ task shifting.ti,ab birth attendant\$.ti,ab traditional birth attendant\$.ti,ab exp Community Health Services/	exp Developing Countries (developing adj5 countr\$.ti,ab exp Africa/ exp Asia/ exp South America/ exp Latin America/ exp Central America/

MEDLINE (1950 – 11/21/10) 2,964 results	EMBASE (1981 – 11/21/10) 993 results	CINAHL (1980 – 11/21/10) 2,867 results	Global Health (1910 – 11/21/10) 824 results
TOTAL REFERENCES 7,648 results			
AFTER DEPLICATION 5,647 results			

APPENDIX B

References to Articles for Additional Research, Listed by Subject and by Country

(some, but not all, have been referenced in the text)

MULTIPLE DISEASES

DEMOCRATIC REPUBLIC OF CONGO:

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