



International Literature Review

Close-to-Community Providers

**An analysis of systematic reviews on effectiveness and a synthesis of studies
including factors influencing performance of CTC providers**

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Abbreviations and acronyms

ACT	Artemisinin Combination Therapy
ANC	Antenatal care
ANM	Auxiliary Nurse Midwife
ART	Antiretroviral therapy/treatment
ASHA	Accredited Social Health Activist
CBSV	Community-Based Surveillance Volunteer
CBW	Community-Based Worker
CDI	Community-directed intervention
CHEW	Community Health Extension Worker
CHW	Community Health Worker
CHV	Community Health Volunteer
CI	Confidence interval
CMD	Community Medicine Distributor
CTC	Close-to-community
DMPA	Depot-medroxyprogesterone acetate
HCW	Health Care Worker
HDA	Health Development Army
HEP	Health Extension Package
HEW	Health Extension Worker
HMM	Home-based management of malaria
HSA	Health Surveillance Assistant
IMCI	Integrated management of childhood illnesses
IMNCI	Integrated management of neonatal and childhood illnesses
LHV	Lady Health Visitor
LHW	Lay Health Worker/Lady Health Worker
LMIC	Low- and middle-income country
MDG	Millennium Development Goal
M&E	Monitoring and evaluation
NGO	Non-governmental organization
NMR	Neonatal mortality rate
OR	Odds Ratio
PLWHA	People living with HIV and AIDS
PMTCT	Prevention of mother-to-child transmission
PNC	Postnatal care
PPH	Postpartum haemorrhage
QA	Quality assurance
RCT	Randomized controlled trial
RDT	Rapid diagnostic test
RR	Risk ratio/relative risk
SP	Sulfadoxine-pyrimethamine
TBA	Traditional Birth Attendant
VMW	Village Malaria Worker
WHO	World Health Organization

Executive summary

Introduction

This literature review is part of the context analysis undertaken for REACHOUT — linking communities and health systems. REACHOUT is an ambitious five-year international research consortium funded by the European Commission and aims to generate knowledge to develop the role of close-to-community (CTC) providers of health care in preventing, diagnosing and treating major illnesses and health conditions in rural and urban areas in Africa and Asia.

CTC providers are health workers who carry out promotional, preventive and/or curative health services and who are often the first point of contact at community level. They can be based in the community or in a basic primary health care facility. A CTC provider has at least a minimum level of training in the context of the intervention that they carry out and not more than two to three years of professional training. They can improve access to services and contribute to better health outcomes. CTC providers include a variety of different types of health workers, of which Community Health Workers (CHWs) are a large group.

Policymakers and people implementing health services are increasingly looking to CTC providers to help them overcome various impediments to universal access to health care. But there is currently little evidence of which CTC provider strategies work best in different settings. This literature review has two main objectives:

- to give an overview of the available evidence regarding the effectiveness of CTC providers; and
- to identify factors that form barriers to or enablers of the performance of CTC providers and the services they provide, with a focus on:
 - a. broad contextual factors;
 - b. health system factors; and
 - c. intervention design factors.

Methodology

We searched six databases for relevant literature on CTC providers and retrieved both systematic reviews (to address our first objective) and single qualitative or quantitative studies (to address our second objective). Papers were included or excluded using set criteria. Separate data extraction forms were developed for reviews and single studies based on a draft conceptual framework, and filled in after reading the full text of papers. Studies included in the review regarding our second objective were read twice. Quality assessment of reviews was conducted using Amstar, and the quality assessment of single studies was conducted with a quality assessment checklist based on CASP. Themes and categories were identified by assessing all data extraction forms.

Results: effectiveness of CTC providers

Evidence of moderate quality emerging from the existing systematic reviews shows the effectiveness mainly of health promotion activities of CHWs on end-user outcomes, and, as yet, limited conclusive evidence on mortality and morbidity is available. The evidence reported here is primarily based on

reviews that have applied rigorous review criteria. There is evidence of moderate quality that care provided by CHWs, compared to usual care, leads to the following outcomes:

- probably an increase in immunization uptake in children;
- an increase in the number of women who initiate breastfeeding;
- an increase in the number of women who breastfeed their child at all;
- an increase in the number of women who breastfeed their child exclusively for up to six months;
- probably a reduction in neonatal mortality (many studies only from Asia);
- probably an improvement in cure rates for pulmonary TB; and
- little or no effect on completion of TB preventive treatment.

There is low-quality evidence that CHWs, when compared to usual care, may reduce child morbidity and mortality (most evidence comes from studies on malaria interventions). CHWs may increase the likelihood of seeking care for childhood illnesses when compared to usual care. They also may reduce maternal mortality, but the quality of the evidence is again low, partly because of a lack of quality studies. Evidence on the effectiveness of CHWs in promoting and providing family planning, such as condoms and contraceptive pills, is available. There are few studies available about the role and tasks of CHWs in the promotion and provision of other types of contraceptives, although there are some studies available that focus on their role in the administration of injectable contraceptives. The World Health Organization (WHO) recommends initiation and maintenance of injectable contraceptives using a standard syringe by CHWs only with targeted monitoring and evaluation (M&E). Regarding HIV and AIDS, CHWs seem to have a positive impact on end-user outcomes, such as condom use, counselling and testing and treatment adherence, but conclusive evidence on impact level is still missing.

Recent evidence on the effect of CTC providers in their occasional role as facilitators of women's groups shows that they can have an effect on both maternal and neonatal mortality [1]. Evidence on effectiveness of trained Traditional Birth Attendants (TBAs) on outcomes regarding maternal health is, as yet, not convincing, while their effect on neonatal health seems promising. Regarding auxiliary nurses and auxiliary nurse midwives, evidence shows that they are effective in conducting various maternal and neonatal health and family planning tasks.

The above shows that most available evidence refers to CHWs and less to other CTC providers, such as auxiliary staff. For several health subjects, such as child health and HIV and AIDS, more studies are needed to strengthen evidence on the effectiveness of CTC providers in these fields.

Results: factors influencing CTC providers' performance

We developed an a priori framework as a basis on which we interrogated the literature. The framework divides the factors influencing the performance of CTC providers into three categories:

- broad contextual factors, which include:
 - community context (social networks, gender norms, cultural practices, beliefs);
 - political context (type of policy, security); and
 - other contextual factors (legal system, environment, economy);
- health system factors; and

- intervention design factors.

Broad contextual factors

Gender roles and norms and social and cultural norms and values are community contextual factors that can have an influence on the performance of CTC providers and/or the effectiveness of CTC interventions. For example, social and gender norms, such as inheritance, polygamy and male sexual and reproductive entitlement to wives' younger sisters, have a bearing on the effectiveness of CTC interventions around sexual health and HIV. Community factors that directly relate to the design of CTC interventions are community acceptance, trust and respect, community expectations and community ownership and support. For example, the involvement of community members in the selection of CTC providers could enhance CTC providers' performance, as reported by several studies.

Evidence shows that political commitment and backing for implementation are key factors for the effectiveness of large-scale CTC interventions. Policy choices related to consistency between roles and absorption of capacities of those mandated with oversight and implementation of CTC services, particularly in the context of decentralized political systems, has a bearing on how well CTC interventions are implemented at the local level. Coherence or the lack thereof with other policies, particularly those concerned with the legality of certain cadres providing certain services, also determines the effectiveness of CTC interventions. The extent to which CTC interventions meet these conditions has a bearing on the performance of CTC providers.

Other broad contextual factors that we identified in the literature are: poverty and economic challenges, geographical factors, conflict/security and disease prevalence.

Health system factors

The literature review identified a number of health system factors that influence CTC providers' performance, which we divided into: the presence of functioning services, infrastructure and supply systems; the presence of an operational referral system; clarity on roles of CTC providers and their operating procedures; the health system's ability to accommodate CTC providers' expectations; the presence of a monitoring and supervision system; and an explicit buy-in (or the absence of buy-in) from various state agencies.

Intervention design factors

The literature revealed that various aspects related to the design of the CTC intervention had a major effect on CTC providers' performance. We discuss factors relating to three focus areas: human resource management, programme quality and M&E.

The literature consistently shows that CTC providers find monetary and material incentives important, whether on a regular basis, incidentally or performance-based. Incentives are in many cases a combination of monetary and material support. Non-monetary incentives are important for the volunteers who do not receive other incentives, as well as the ones who do. Typical examples of factors that motivate CTC providers to become and stay on as a volunteer are expressed as job satisfaction, community recognition and associated status, and also recognition by health staff and managers. A key factor affecting CTC providers' performance highlighted by a number of authors is a

working supervision system, whereby providers from the formal health staff (and sometimes others — for example, project or research staff) monitor, guide, give feedback to and motivate CTC providers. Across various studies, the importance of adequate supervision (in terms of both quality and quantity (frequency)) was emphasized by both the host organizations as well as CTC providers themselves. Very few studies reported on performance appraisal systems for CTC providers.

Regarding programme quality, the literature findings mostly dealt with training and related issues. Many studies reported initial training as being important, whereby the duration varies by subject, scope of work and CTC provider cadre. Regarding the content of training, a combination of theory and (various forms of) practice is widely accepted as a requirement, although the mix of both varies and seems in need of more discussion. The need for (regular) refresher training and training of both CTC providers and their supervisors was also emphasized by some, as well as follow-up of training with skills assessment and monitoring of performance with quality assessment tools. The literature reviewed hardly addressed the use of guidelines and protocols.

Programme monitoring was mentioned in some studies as being relevant to CTC providers' performance, although no relevant details regarding how it influenced their performance were shared.

Other intervention design factors that had a bearing on the performance of CTC providers were: the need for a reliable and robust referral system; institutional arrangements such as good collaboration across service levels and teamwork; clarity of roles and responsibilities; presence of standard operating procedures and explicit oversight mechanisms; and the importance of engaging beneficiary communities to ensure their buy-in.

Discussion

The initial health themes of interest of the six REACHOUT countries are: maternal and newborn health (Ethiopia and Indonesia), child health (with a focus on malaria) (Mozambique and Malawi), HIV and AIDS (Kenya and Malawi) and sexual and reproductive health (Bangladesh). Generally, evidence on the effectiveness of CTC providers regarding newborn health is of moderate quality, while on the other health themes of interest the quality is low. Still, interventions on these health themes can draw on single studies that were part of the included reviews, as far as they are comparable to the setting of the specific REACHOUT country and area of implementation.

The literature brings to the fore many different types of intervention design factors that could be the focus of the interventions that are going to be developed. Research into different measures that address these factors and different combinations of these measures could yield more information about which factors have the potential to improve the performance of CTC providers and the effectiveness of the services they offer. Based on this literature review, the following intervention research areas could be interesting for REACHOUT:

- supervision mechanisms;
- community support mechanisms;
- measures that address communication of CTC providers with health professionals;
- referral systems;
- the balance between curative and promotive/preventive tasks of CTC providers;

- the influence of the CTC provider profile on the effectiveness of the programme;
- the effects of various types of non-financial incentives that are provided by the programme/ health system;
- M&E; and
- different types of continuous learning programmes.

The main limitation of this literature review is that only English-language (systematic) reviews and studies from 2007 to July 2013 were covered.

Conclusion

There is a wide range of literature available on CTC providers. Still, more in-depth evidence is needed on the factors that influence CTC providers' performance, because many studies do discuss these factors but do not specifically study them. Mechanisms that make interventions work or not are often not fully investigated, and context-specific factors are not always described. It is the ambition of REACHOUT to conduct research in six countries, taking into account these aspects, with the CTC provider at the centre, with the ultimate goal of improving community health.

1. Introduction

1.1 Background to this literature review

This literature review is part of the context analysis undertaken for REACHOUT — linking communities and health systems. REACHOUT is an ambitious five-year international research consortium funded by the European Commission. REACHOUT helps to understand and develop the role of close-to-community (CTC) providers working on improving the health status of communities in rural and urban areas in Africa and Asia. The aim of REACHOUT is:

To maximize the equity, effectiveness and efficiency of CTC services in rural areas and urban slums in six countries: Bangladesh, Ethiopia, Indonesia, Kenya, Malawi and Mozambique.

REACHOUT has four specific objectives:

- to build capacity to conduct and use health systems research to improve CTC services;
- to identify how community context, health policy and interactions with the rest of the health system influence the equity, effectiveness and efficiency of CTC services;
- to develop and assess interventions with the potential to make improvements to CTC services; and
- to inform evidence-based and context-appropriate policymaking for CTC services.

This international literature review focuses primarily on the effectiveness and performance of CTC providers and is one of the outputs of the context analysis, which is addressing the second objective. Besides this international literature review, the context analysis consists of six country-level context analyses, in which country-specific desk studies are combined with stakeholder mappings and, most importantly, qualitative research on evidence for interventions which have an impact on the contribution of CTC providers to the delivery of effective, equitable and efficient care, and identification of contextual, health system and intervention design factors that form barriers to or facilitators of the performance of CTC providers and services.

The literature review will support the development of a common analytical framework. The purpose of the framework is to guide the inter-country comparative context analysis and the primary focus of the CTC intervention improvement cycles that will take place in the six REACHOUT countries during years 2 to 5 of the programme.

1.2 Close-to-community providers

Who are close-to community providers?

Many countries are striving to achieve the Millennium Development Goals (MDGs) and universal health coverage. In the 1970s, countries invested in Community Health Workers (CHWs) who received basic training and were often volunteers. However, from the 1980s onwards, programmes involving CHWs went into decline due in part to political instability, economic policies and difficulties in financing, but also due to doubts regarding the effectiveness, cost benefits and quality of CHW

interventions and problems with keeping up the necessary support systems (human resource management, logistics etc.) [2, 3].

Health systems are once again turning to strengthening CTC services through the use of CTC providers. There are many types of CTC providers, including but not limited to CHWs, village midwives, Traditional Birth Attendants (TBAs), informal private practitioners and lay counsellors, delivering a wide range of services in different contexts. Their roles include education, counselling, screening and point-of-care diagnostics, treatment, follow-up and data collection. The scope of their work ranges from maternal and child health to HIV counselling and testing or TB diagnosis. What these approaches have in common is their reliance on staff who work and (often) live at the community level, engaging with people in their own dwellings or workplaces and in facilities that are the first point of contact with the health system. By meeting people in their homes and communities, CTC providers are in a unique position to observe and understand the factors that influence health, gaining insights that may have been missed if the consultation had taken place in a higher-level health facility [4]. This means that there is true potential for CTC services to strengthen the delivery of health services by tailoring services to best meet the needs and realities of individuals and households, and making more appropriate links to the health sector and beyond.

CTC providers may operate in the public or private sectors, respond to single or multiple diseases and health issues and have differences in their level of knowledge and training, their practice setting and their relationship with regulatory systems [5]. Within this category, CHWs, the collective term used for many types of CTC providers, have been defined as “any health worker carrying out functions related to health care delivery; trained in some way in the context of the intervention, and having no formal professional or paraprofessional certificate or degree in tertiary education” [6]. In addition, it is argued that CHWs “should be members of the communities where they work, should be selected by the communities, should be answerable to the communities for their activities, should be supported by the health system but not necessarily a part of its organisation and have shorter training than professional workers” [7]. There is a growing recognition of CHWs as an integral component of the health workforce needed to achieve MDGs [8]. The focus on achieving universal coverage has seen some countries use CHWs nationwide and others seriously considering this. As well as themselves being a diverse group, CHWs also interact with a range of other types of CTC providers, including those working in vertical programmes, auxiliary staff, community workers such as health promoters and volunteers and informal private practitioners (such as traditional healers and grocery store owners). The interactions of CHWs with other community-level providers are an important part of CTC services [9], but key knowledge gaps remain around how this interaction plays out in different rural and urban slum contexts and what the potential impact on and lessons for the health sector are.

CTC providers are often either an integral part of the public health system workforce or are employed within programmes managed by non-governmental organizations (NGOs) — for example, BRAC in Bangladesh. Their responsibilities vary within and between different contexts and may range from a single health area (e.g. maternal health) to multiple areas of curative and preventive interventions. The level at which they operate also varies, from full-time, salaried workers with many responsibilities (Malawi and Ethiopia) to part-time volunteers with limited tasks (TBAs in Indonesia, CHWs in Mozambique).

For the purpose of this literature review and the wider REACHOUT context analysis we have defined CTC providers based on their involvement in community homes, community groups and community health facilities that may be staffed by auxiliary staff. CTC services are primary health care services provided by CTC providers in the community or at a basic primary health care facility. CTC interventions are strategies and activities involving CTC providers, with the aim of improving access to and the quality of health services at community level. CTC services and interventions are often part of community health and primary health care programmes. We will use 'CTC providers' as an umbrella term to describe health workers at community level. For the purpose of the international literature review we have defined CTC providers as follows:

A CTC provider is a health worker who carries out promotional, preventive and/or curative health services and who is the first point of contact at community level. A CTC provider can be based in the community or in a basic primary facility. A CTC provider has at least a minimum level of training in the context of the intervention that they carry out and not more than two or three years of para-professional training.

CTC providers include a broad variety of health workers, including CHWs. We use the definition by Lewin et al. (2010) for lay health workers when we refer to CHWs (we do not use the term 'lay health workers', as they may be regarded by some as having no training in the intervention). Other names that are used for CHWs include, for example, village health workers, health promoters, etc. CTC providers also include auxiliary health workers. For auxiliary workers we use definitions proposed by WHO.¹

The REACHOUT definition of CTC providers excludes informal cadres, such as community pharmacists, informal private practitioners, traditional healers and TBAs, if they are *not trained* for an intervention and *do not collaborate* with other actors in the health system. The definition also excludes cadres with tertiary education. This does not mean that they are completely excluded from the REACHOUT literature review or processes; we will still address the *interactions* between CTC providers and these cadres.

Why are we interested in close-to-community providers?

Progress on the health MDGs is being hindered in many settings by an insufficient number of trained health workers. To overcome chronic financial and human resource shortages, health services are increasingly relying on CTC providers to reach out to underserved communities [8, 10]. CTC services are often introduced as part of an attempt to expand primary health care services at low cost; by being close to the community they have the potential to move further towards universal coverage of

¹ WHO (2012). Definition of auxiliary nurse: "Have some training in secondary school. A period of on-the-job training may be included, and sometimes formalized in apprenticeships. An auxiliary nurse has basic nursing skills and no training in nursing decision-making. However, in different countries the level of training may vary between a few months and 2–3 years. Different names for this cadre are: auxiliary nurse, nurse assistant, enrolled nurse (also called nurse technicians or associate nurses)." Definition of auxiliary nurse midwife: "Have some training in secondary school. A period of on-the-job training may be included, and sometimes formalized in apprenticeships. Like an auxiliary nurse, an auxiliary nurse midwife has basic nursing skills and no training in nursing decision-making. Auxiliary nurse midwives assist in the provision of maternal and newborn health care, particularly during childbirth but also in the prenatal and postpartum periods. They possess some of the competencies in midwifery but are not fully qualified as midwives."

services. The term ‘universal coverage’ has been described as having three dimensions: a population dimension (who is to be covered, including equity concerns); a health service dimension (which services are to be covered, including their effectiveness); and a financing dimension (how the services are to be paid for, and how efficient and cost-effective they are). CTC services should be planned in light of these dimensions [11]. CTC providers have an important set of characteristics which shape their potential contributions to these three dimensions. On the one hand, their proximity to and acceptance by the communities in which they work can improve their reach (widen population coverage). On the other hand, their lack of or limited professional qualifications can hinder their ability to perform according to minimum standards. Finally, while personnel costs (monetary and material incentives) for individual CTC providers may be lower, high attrition rates and poor capacity mean that start-up and supervision costs are high. The above implies that attention should be paid to concerns in relation to the equity, effectiveness and efficiency of programmes involving CTC providers [12]; however, there have been few evaluations of CTC programmes that assess these three factors.

The ability of CHWs to deliver effective health services depends on many different factors. Vertical, disease-specific programmes that use CTC providers for service delivery tend to give limited consideration to the multiple workloads and competing priorities they face. CTC intervention programmes often struggle to plan and manage their human resources, resulting in high staff attrition and poor effectiveness, while the quality and supervision of services varies widely. CTC services often lack monitoring and evaluation (M&E) systems, and referral mechanisms to health facilities are usually weak. Trust and (monetary or other) support from their community can influence the performance of CHWs [13]. In addition to health system and community context factors, broader contextual factors could also influence CTC providers and the equity, effectiveness and efficiency of their services. CTC providers do not work in a vacuum: they work in a cultural, social, gendered, political, economic, legal and communication context. This context will vary depending on whether they are based in rural or urban areas and according to their own age, gender and professional and familial experience.

CTC providers are embedded within communities and can offer opportunities to strengthen health services equitably, effectively and efficiently. The contribution of CTC providers to community health is often not valued, nor is their potential maximized. There is a need for the health system to better understand the context and conditions of CTC services and the role of CTC providers therein, to strengthen and support these critical services to realize their potential.

1.3 Objectives of the literature review

This international literature review has two main objectives:

- to give an overview of the available evidence regarding CTC providers’ effectiveness; and
- to identify factors that form barriers to or enablers of the performance of CTC providers and the services they provide, with a focus on:
 - a. broad contextual factors;
 - b. health system factors; and
 - c. intervention design factors.

The literature review will also identify promising examples of interventions that can be used and further developed by countries in designing their improvement cycles, and it will identify gaps in knowledge about what works and why, suggesting where new interventions could focus.

2. Methodology

2.1 Approach

Objective 1

A number of systematic reviews are available that summarize and draw conclusions on the effectiveness of CTC providers. To address the contribution of CTC providers to effective care, we synthesized the evidence from these reviews, with a special focus on outcomes regarding morbidity and mortality related to health priorities that are particularly relevant to the REACHOUT countries: maternal, neonatal and child health and HIV, tuberculosis and malaria.

Objective 2

Regarding the identification of contextual factors that form barriers to or enablers of the performance of CTC providers and related services, we used a framework approach [14]. Based on reading selected international literature, possible contextual factors and their (inter-)relationships were identified, resulting in a draft conceptual framework (as presented in Section 4.1). This initial framework has been used as a basis for data extraction and for the categorization of findings.

2.2 Criteria for considering studies for this review

Types of studies included

We reviewed existing Cochrane and other (mainly systematic) reviews to gain insight into the effectiveness of CTC providers (objective 1). To gain insight into barriers to and enablers of CTC providers' performance (objective 2), we reviewed a wide range of literature (peer-reviewed qualitative and quantitative studies, research reports, and programme reports and evaluations) from low- and middle-income countries (LMICs). We have included programme evaluations in our review to gain better insight into the context in which CTC providers operate. We excluded cost-effectiveness studies and economic evaluations, as a separate literature review on the cost-effectiveness of CHWs was undertaken at the same time.

Types of participants

The participants included in addressing objective 1 of this literature review were CTC providers as defined in Section 1.2. Regarding objective 2, the literature review covered the following types of participants: CTC providers themselves, their clients and their families/carers, CTC provider supervisors, the wider community, policymakers, programme managers, other (non-CTC i.e. professional) health workers, and any others directly involved in or affected by CTC service provision.

Types of interventions

For both objective 1 and 2, we focused on CTC providers' involvement in preventive, promotional and curative service provision to adults, children and pregnant women at the primary health care level (household, community or first-point-of-contact health facility).

For objective 2, we were particularly interested in interventions that addressed:

- human resource planning and management of CTC providers;
- quality assurance (of CTC interventions); and
- M&E strategies and activities involving CTC providers.

These types of interventions were chosen to be of particular interest in REACHOUT, based on an initial desk review (in the proposal writing phase), discussions with key stakeholders on national priorities and their suitability for inter-country analysis between the six REACHOUT countries.

The contextual factors and their influence on CTC providers' performance we explored can be summarized as:

- broad contextual factors;
- health system interactions; and
- intervention design factors.

Types of outcome measures

For the purpose of this literature review, we differentiated the following outcome measures: impact (for example, in case a CTC intervention had an effect on mortality), end-user outcomes (for example, in case a CTC intervention had an effect on clients' health-seeking behaviour) and performance (outcomes direct related to the performance of a CTC provider). We developed these categories after initially reading several reviews and studies on CTC providers. We observed a wide range in outcome measures used. In general, effectiveness studies (relevant for objective 1 of this literature review) tend to focus on impact and end-user outcomes — not on outcomes at CTC performance level. Conversely, studies focusing on factors influencing CTC providers' performance (relevant for objective 2 of this literature review) mostly measure outcomes at the level of the CTC provider and sometimes also at end-user or impact level.

The types of impact measures that we looked at were:

- morbidity;
- mortality;
- incidence; and
- health status and well-being.

The types of end-user (clients') outcome measures considered were:

- utilization of services;
- health-seeking behaviour (including claiming rights/agency, health promotional and preventive behaviour, issues around perception of quality);
- adoption of practices that promote health; and
- community empowerment.

The types of CTC provider outcome measures covered were:

- self-esteem;
- motivation;
- attitudes;
- competencies;

- adherence to standards and procedures;
- job satisfaction; and
- capacity to facilitate community agency.

Table 1 presents the inclusion criteria used in this literature review, for each of the two objectives.

Table 1. Overview inclusion criteria

Subject	Objective 1	Objective 2
Studies	(Systematic) reviews	Peer-reviewed qualitative and quantitative studies, research reports, programme reports and evaluations from LMICs
Participants	CTC providers	CTC providers, their clients and their families/carers, CTC provider supervisors, the wider community, policymakers, programme managers, other (non-CTC i.e. professional) health workers, and any others directly involved in or affected by CTC service provision
Interventions	CTC providers' involvement in preventive, promotional and curative service provision to adults, children and pregnant women at the primary health care level	CTC providers' involvement in preventive, promotional and curative service provision to adults, children and pregnant women at the primary health care level, with a focus on: <ul style="list-style-type: none"> • human resource planning and management • quality assurance • M&E
Outcome measures	Impact measures: <ul style="list-style-type: none"> • morbidity • mortality • incidence • health status and well-being 	End-user (clients') outcome measures: <ul style="list-style-type: none"> • utilization of services • health-seeking behaviour • adoption of practices that promote health • community empowerment CTC provider outcome measures: <ul style="list-style-type: none"> • self-esteem • motivation • attitudes • competencies • adherence to standards and procedures • job satisfaction • capacity to facilitate community agency

2.3 Search methods

We searched EMBASE, PubMed (including Medline), Cochrane, CINAHL, POPLINE and NHS-EED for eligible studies. See Annex 1 for the specific search terms we used. We partly used the search strategy used by the Cochrane review of Lay Health Workers' (LHWs) effectiveness [6]. We used the

list of terms used by Lewin et al. (2010) to describe LHW interventions but made additions to broaden the scope to CTC providers. Furthermore, we combined the terms for these CTC providers with the particular subjects of interest, such as human resource management, quality assurance and M&E. We also searched the reference lists of all papers and relevant reviews identified.

Delimiters

We included English-language studies from 2007 to 2013, for feasibility reasons. Regarding single studies for objective 2 of this literature review, we only included those from LMICs. Furthermore, we did not include studies that are included in Glenton et al. (2013) [15], a very recent review also looking into factors influencing the performance of CHWs in the field of maternal, neonatal and child health. As already mentioned, we also excluded cost-effectiveness studies.

2.4 Data collection and analysis

Selection of studies

Two authors independently assessed the titles and abstracts of the identified records to evaluate their potential eligibility, and those that were clearly irrelevant to the topic of this study were discarded at this stage. In case of different opinions, the two review authors discussed the inclusion of a document and reached consensus. Persisting disagreements between the review authors was resolved via further discussion or, if needed, by seeking a third reviewer's view. The full-text reviews (regarding objective 1) were read by one review author, and the full-text papers on single studies (regarding objective 2) were assessed by a team of seven reviewers and after that a double read by two of the seven reviewers, based on the review's inclusion criteria.

Data extraction and management

Data extraction related to objective 1 of this literature review was done in a data extraction form in which the following categories were addressed for each review: the type of review, the type of CTC provider, the health subject, the countries included in the review, the objective of the review and the main findings of the review. For objective 2 of this literature review we used a standardized data extraction form developed from the conceptual framework (for the data extraction form, see Annex 2; for a further explanation of the conceptual framework, see Section 4.1). The data extraction form was piloted, and a few adjustments were made to make categories and sub-categories clearer.

Selection criteria

Selection criteria for systematic reviews (objective 1) were as follows: systematic reviews using the Cochrane methodology and systematic reviews with a clearly described methodology including appraisal of qualitative studies, project evaluations, intervention studies and multivariate analysis of contextual factors that enable analysis of how the intervention contributed to the outcome(s), all related to CTC providers.

To be included into the review for objective 2, studies had to be primary (qualitative or quantitative) studies meeting both of the following criteria:

- studies on CTC providers' involvement in promotional, preventive or curative primary health care or community health care; and

- studies that identify a factor influencing CTC providers' performance or a condition for scaling up CTC providers' services (either identified in the objectives or explained in the results/discussion sections).

Selection criteria for inclusion of project evaluations were: evaluations that contain a clear description of at least one factor, condition or measure influencing relevant outcomes using a logical explanation for the pathway that connects factor(s) with the outcome.

Assessment of quality

For the quality assessment of systematic reviews (objective 1), we used Amstar [16]. If three or less of the criteria were addressed positively, the quality of the review was considered low; if four to eight criteria were addressed positively, we considered the quality of the review average; and if nine or more criteria were addressed positively, we considered the quality of the review high.

A quality appraisal framework was developed and applied for each single study or programme evaluation selected (objective 2). The quality appraisal framework was based on the Critical Appraisal Skills Programme (CASP) quality assessment checklist for qualitative studies [17]. The following questions were used:

- Is there a clear statement of the aims of the research or the programme evaluated?
- Is the study/programme context clearly described?
- Is the study design or methodology appropriate for the hypotheses/addressing the aim of the research or programme evaluated?
- Is the recruitment strategy for participants in the study or programme appropriate to the aims of the research or the programme?
- Is the method of data collection clearly described and appropriate to the research question/objective of the evaluation?
- Is the method of data analysis clearly described and appropriate to the research question/objective of the evaluation?
- Are the claims made supported by sufficient evidence? — i.e. did the data provide sufficient depth, detail and richness?

Regarding objective 2 of this literature review, we did not use other quality assessment tools (for example, Grade for randomized controlled trials (RCTs)), because we included qualitative studies, focused on contextual factors influencing the performance of CTC providers or CTC services, and we did not focus on measuring effectiveness.

The quality of the reviews was assessed by one review author, and for the studies included addressing objective 2 of this literature review double assessment was done. Quality appraisal was not used for excluding studies. It served as a tool to weigh the importance of selected studies and evaluations.

Data synthesis

Themes and categories were identified by assessing all data extraction forms. Analysis of the content of all included reviews (objective 1) was done by one review author. Analysis of the content of all

included papers related to objective 2 was conducted by two reviewers for each category, as presented in the data extraction form. Our conceptual framework was leading in the process.

3. Effectiveness of CTC providers

Several systematic reviews and literature studies address the effectiveness of health interventions or programmes executed by CTC providers. Most evidence on effectiveness concentrates on CHWs, and some evidence exists on other types of CTC providers such as (trained) peer supporters, TBAs and auxiliary staff. In this chapter, a short overview is given of the current available evidence, categorized by the type of programme or a specific aspect of a programme. For an overview of the 41 systematic reviews, reviews and other papers used for this chapter, see Annex 3.

The interventions presented in this chapter are complemented by activities such as the right package for training, supervision, incentives, community support and other health systems strengthening activities, and influenced by other contextual factors. In Chapter 4 we review evidence on factors which facilitate or hinder the effectiveness of CTC interventions in different settings. Finally, in Chapter 5 we discuss the implications of these findings for further REACHOUT work.

3.1 Maternal health

Maternal morbidity and mortality

Community Health Workers

Lewin (2010) conducted a systematic review of 82 studies (all RCTs) to assess the effectiveness of various CHW programmes and interventions. The majority of the included studies were conducted in high-income countries (n=55), but among those, many focused on low-income and minority populations. The rest of the studies (n=27) were from LMICs [6]. Currently, this Cochrane review is being updated, and in the update, 65 studies are from high-income countries and 42 from LMICs [18]. While the review of 2010 did not include any conclusions on maternal health — and especially the effect of LHW interventions on maternal mortality — the review that will be published in 2013 concludes that there is evidence of low quality (when comparing LHW programmes with usual care) that LHWs may reduce maternal mortality (risk ratio (RR) 0.86, 95% confidence interval (CI) 0.34–2.19; P = 0.75) [18].

A meta-analysis by Lassi et al. (2010) on the effectiveness of community-based intervention packages also did not find much impact on reducing maternal mortality (RR 0.77, 95% CI 0.59–1.02, random-effects (10 studies, n = 144,956), I² 39%, P value 0.10). However, a significant reduction in maternal morbidity (by 25%) was observed as a consequence of the implementation of community-based interventional care packages (RR 0.75, 95% CI 0.61–0.92, random-effects (four studies, n = 138,290), I² 28%). It also found that the implementation of community-based interventional care packages increased referrals to health facilities for pregnancy-related complications by 40% (RR 1.40, 95% CI 1.19–1.65, fixed-effect (two studies, n = 22,800), I² 0%, P value 0.76). Only intervention packages that included additional training from normal government/NGO training of outreach workers were included. Outreach workers were defined as residents from the community who are trained and supervised to deliver maternal and newborn care interventions to the target population, namely: lady health workers/visitors, community midwives, community/village health workers, facilitators or TBAs. Twenty-seven papers (18 original projects) were included [19].

Earlier, Kidney et al. (2009) did a systematic review on the effectiveness of community-level interventions to reduce maternal mortality in LMICs. The review did not focus on one specific type of CTC provider; studies with interventions on TBAs and women's groups were included. Five cluster RCTs and eight cohort studies of community-level interventions were included in the review. Two high-quality cluster RCTs (Manandhar et al. (2004) and Jokhio et al. (2005), which were also included in Lassi et al. (2010) described above and in Section 3.2), aimed at improving perinatal care practices, showed a reduction in maternal mortality reaching statistical significance (OR 0.62, 95% CI 0.39–0.98). Three equivalence RCTs of minimal goal-oriented versus usual antenatal care (ANC) showed no difference in maternal mortality (OR 1.09, 95% CI 0.53–2.25). The cohort studies were of low quality and did not contribute further evidence. The evidence from this review, albeit based on only two trials and both in rural Asia, suggests that community-level interventions to improve perinatal care practices can also reduce maternal mortality [20].

Facilitators of women's groups

Recently, Prost et al. (2013) released a systematic review and meta-analysis that assessed the effects of women's groups practising participatory learning and action, compared with usual care, on birth outcomes in low-resource settings. In this case, CTC providers were facilitators of women's groups, who are local women who received training for between 7 and 11 days in maternal and newborn health and participatory facilitation techniques. Seven studies from Bangladesh, India, Malawi and Nepal were included. Meta-analyses of all trials showed that exposure to women's groups was associated with a 37% reduction in maternal mortality (OR 0.63, 95% CI 0.32–0.94), with high heterogeneity for maternal results ($I^2=58.8\%$, $p=0.024$). In the meta-regression analyses, the proportion of pregnant women in groups was linearly associated with a reduction in maternal mortality ($p=0.026$). A sub-group analysis of the four studies in which at least 30% of pregnant women participated in groups showed a 55% reduction in maternal mortality (OR 0.45, 95% CI 0.17–0.73). The intervention was cost-effective by World Health Organization (WHO) standards and could save the lives of an estimated 41,100 mothers per year if implemented in rural areas of 74 Countdown countries. The authors concluded that, with the participation of at least a third of pregnant women and adequate population coverage, women's groups practising participatory learning and action are a cost-effective strategy to improve maternal and neonatal (see Section 3.2) survival in low-resource settings [1].

Trained TBAs

A meta-analysis of the published literature in LMICs (Wilson, 2011) concerning the effectiveness of strategies for incorporating training and support of TBAs on perinatal and maternal mortality demonstrated no significant impact on maternal mortality. Six cluster RCTs and seven non-RCTs were included [21]. Sibley et al. (2012) conducted a Cochrane review to assess the effects of TBA training on health behaviours and pregnancy outcomes and also found no significant impact on maternal mortality (only one of the included studies reported a non-significant decline in the maternal mortality rate; see below) [22].

Misoprostol to prevent postpartum haemorrhage

A Cochrane review published in 2012 was conducted to determine whether increasing access to misoprostol by providing it ahead of labour and childbirth to lay individuals makes a difference to

the health of mother and baby. The review found no RCTs to be included. The authors concluded that there is insufficient evidence to support a system of distributing misoprostol ahead of labour and childbirth within the community for preventing or treating excessive blood loss after birth [23].

However, Hundley et al. (2012) also reviewed the safety and effectiveness of oral misoprostol in preventing postpartum haemorrhage (PPH) in home-birth settings in LMICs. The review included 10 papers, covering two RCTs and four non-randomized trials. The misoprostol was distributed and administered by frontline health workers. In two studies, the misoprostol was administered by trained TBAs, in one study by Auxiliary Nurse Midwives (ANMs) and in one study by CHWs. In two studies, misoprostol was given to the woman herself at the ANC clinic, and the misoprostol was administered by the woman herself or an attendant. The authors concluded that the administration of oral misoprostol through frontline health workers in home-birth settings in LMICs is associated with a significant reduction in the incidence of PPH. The association seems to be maintained when misoprostol is distributed directly to women, rather than through a health worker, and administered either by the woman or her attendant; however, the quality of this evidence is very low. In all studies in this review, misoprostol was distributed as part of a package of care that included the training of birth attendants and/or education of women. Adverse effects were not systematically captured, and there was limited consideration of the potential for the inappropriate or inadvertent use of misoprostol in the included studies [24]. The utilization of misoprostol for home births is estimated to have the potential of a 38–81% reduction in maternal mortality at a cost of \$6–170 per disability-adjusted life year (DALY) averted [25, 26].

Recently, WHO published the recommendations ‘Optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting’, on the basis of comprehensive reviews on effectiveness and expert meetings. WHO recommended — apart from many health promotional tasks related to maternal and newborn health and the provision of continuous support for women during labour in the presence of a skilled birth attendant — the administration of misoprostol by LHWs to *prevent* PPH, based on the above stated evidence. According to the same recommendations, auxiliary nurses are recommended to administer misoprostol to *treat* PPH before referral. They are also recommended to administer oxytocin to prevent PPH using a standard syringe or a compact, prefilled auto-disable device. Auxiliary nurses and auxiliary nurse midwives (ANMs) are recommended to conduct other measures regarding PPH as well [27].

Summary

In summary, there is low- to very low-quality evidence that CTC providers’ interventions may have a positive impact on maternal mortality and morbidity. This evidence includes the effect of community-based interventions using TBAs and women’s groups. There is evidence for the effectiveness of the implementation of task shifting of promotional activities and specific service delivery interventions by LHWs, such as the provision of continuous support for women during labour in the presence of a skilled birth attendant and administration of misoprostol to prevent PPH. Auxiliary nurses are recommended to administer misoprostol to treat PPH before referral, to administer oxytocin to prevent PPH using a standard syringe or a compact, prefilled auto-disable device and to conduct other measures regarding PPH.

3.2 Neonatal health

Neonatal morbidity and mortality

Community Health Workers

Lewin (2010 and again in 2012) shows that there is evidence of moderate quality (when comparing LHW programmes with usual care) that LHWs probably reduce neonatal mortality (RR 0.76, 95% CI 0.6–0.98; $P = 0.03$) [18].

Lassi et al. (2010) found a 24% reduction in overall neonatal deaths from the studies reviewed (RR 0.76, 95% CI 0.68–0.84, random-effects (12 studies, $n = 136,425$), I^2 69%, P value < 0.001). The findings from pooled analysis also demonstrated an impact of community interventions on reducing stillbirths by 16% (RR 0.84, 95% CI 0.74–0.97, random-effects (11 studies, $n = 113,821$), I^2 66%, P value 0.001) and perinatal mortality by 20% (RR 0.80, 95% CI 0.71–0.91, random-effects (10 studies, $n = 110,291$), I^2 82%, P value < 0.001). In the sub-group analysis, it was found that community-based packages that disseminated education and promoted awareness related to birth and newborn care preparedness based on building community support groups/women's groups were best for reducing total and early neonatal deaths. On the other hand, packages that comprised community mobilization and education strategies and home visitation by CHWs managed to reduce neonatal, perinatal deaths and stillbirths, possibly because these strategies focused on women in the antenatal period and on early newborn care, management and referrals of sick newborns [19].

Gogia et al. (2011) conducted a systematic review with meta-analysis to assess the effect of community-based neonatal care by CHWs and ANMs on the neonatal mortality rate (NMR) in resource-limited settings. Eleven trials from South-East Asia, one from Greece and one from Gambia were included. In almost all trials the CHW was drawn from the local community. The training of CHWs varied between three and 36 days and was a combination of both theoretical as well as practical aspects. The number of postnatal home visits varied between one and five in all trials. This review indicates that community-based neonatal care interventions by CHWs are associated with reduced neonatal mortality in resource-limited settings, when conducted along with community mobilization activities. Baseline NMR and programme coverage appear to influence the effect size of mortality reduction that could be achieved with these interventions — high baseline NMR and programme coverage being associated with a greater reduction in neonatal mortality. While it appears logical that trials with more home visits should result in greater mortality reduction, this association was not consistently observed across all trials. Some studies suggest that home visits during the first two days of life are likely to yield the largest dividends. Lastly, the fact that in most scaled-up interventions the impact was lower than in small-scale studies highlights the need for ensuring the elements that tend to be neglected when scaling up: quality of training, presence of supportive supervision and motivation of the frontline workers [28].

An earlier systematic review by Gogia et al. (2010) assessed the effectiveness of home visits for antenatal and neonatal care by CHWs on neonatal mortality. Five trials, all from south Asia, satisfied the inclusion criteria. The intervention packages included in them comprised ANC home visits (all trials), home visits during the neonatal period (all trials), home-based treatment for illness (three trials) and community mobilization efforts (four trials). Meta-analysis showed a reduced risk of

neonatal death (relative risk (RR): 0.62; 95% CI: 0.44–0.87) and stillbirth (RR: 0.76; 95% CI: 0.65–0.89), and a significant improvement in antenatal and neonatal practice indicators (more than one antenatal check-up, two doses of maternal tetanus toxoid, clean umbilical cord care, early breastfeeding and delayed bathing). Only one trial recorded infant deaths (RR: 0.41; 95% CI 0.30–0.57). Sub-group analyses suggested a greater survival benefit when home visit coverage was 50% or higher ($P < 0.001$) and when both preventive and curative interventions (injectable antibiotics) were conducted ($P = 0.088$). The authors concluded that home visits for antenatal and neonatal care, together with community mobilization activities, are associated with reduced neonatal mortality and stillbirths in southern Asian settings with high neonatal mortality and poor access to facility-based health care [29].

A review on large-scale, controlled studies that test a community-based intervention package (neonatal health) with a primary focus on family community care interventions (Schiffman et al., 2010) included nine studies, all from Asia. The authors concluded that family community care interventions can have a substantial effect on neonatal and perinatal mortality. Several important common strategies were used across the studies, including community mobilization, health education, behaviour change communication sessions, care-seeking modalities, and home visits during pregnancy and after birth. However, implementation of these interventions varied widely across the studies. All nine studies included Community-Based Workers (CBWs) that were trained to carry out various tasks; however, these tasks varied considerably across the studies. CBWs often had multiple roles in the community and in the home. They were commonly literate women who were recruited from the community [30]. A non-systematic review by Nair et al. (2010) also comes to the conclusion that the best community-based approach is a combination of community mobilization and home visits by CBWs. Both timing of visits and treatment interventions are critical. Furthermore, the lack of evidence from Africa on the effectiveness of CHWs on perinatal health is mentioned [31].

The systematic review by Darmstadt et al. (2009) found moderate evidence that CHWs have a positive impact on perinatal/neonatal outcomes. Meta-analysis of CHW packages (two cluster RCTs and two quasi-experimental studies) showed a 28% reduction in the perinatal mortality rate and a 36% reduction in early neonatal mortality rate; one quasi-experimental study showed a 42% reduction in the intrapartum-related neonatal mortality rate [32]. Bhutta et al. (2009) also state that improving quality of care by upgrading the skills of community cadres has shown a demonstrable impact on perinatal mortality, particularly in conjunction with health systems strengthening and facilitation of referrals [33].

An earlier systematic review by Bhutta et al. (2008) on maternal, neonatal and child health interventions included six RCTs of community-based intervention packages (Bang et al. (1999), Manandhar et al. (2004), Jokhio et al. (2005), Bhutta et al. (2008), Baqui et al. (2008) and Kumar et al. (2005)). These RCTs have also been included in systematic reviews mentioned above. In summary, taken together, the studies provide strong evidence of reductions in neonatal mortality (relative risk (RR) 0.69, 95% CI 0.61–0.77), perinatal mortality (RR 0.71, 95% CI 0.61–0.84) and maternal morbidity (RR 0.71, 95% CI 0.53–0.94) [34].

The recently published WHO recommendations “Optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting” recommended that LHWs should carry out promotional activities for improving neonatal health [27].

Facilitators of women’s groups

Prost et al. (2013) found that participatory women’s groups (seven trials) resulted in a 23% reduction in neonatal mortality (OR 0.77, 95% CI 0.65–0.90) and a 9% non-significant reduction in stillbirths (OR 0.91, 95% CI 0.79–1.03), with high heterogeneity for neonatal results ($I^2=64.7\%$, $p=0.009$). In the meta-regression analyses, the proportion of pregnant women in groups was linearly associated with a reduction in neonatal mortality ($p=0.011$). A sub-group analysis of the four studies in which at least 30% of pregnant women participated in groups showed a 33% reduction in neonatal mortality (OR 0.67, 95% CI 0.59–0.74). The intervention was cost-effective by WHO standards and could save the lives of an estimated 283,000 newborn infants per year if implemented in rural areas of 74 Countdown countries [1].

Trained TBAs

A meta-analysis by Wilson et al. (2011) of cluster RCTs showed that perinatal and neonatal deaths were significantly reduced by interventions incorporating the training, linkage and support of TBAs. The findings from non-RCTs were entirely consistent with those from RCTs [21].

However, Sibley et al. (2012) conducted a Cochrane review to assess the effects of TBA training on health behaviours and pregnancy outcomes and concluded that there is insufficient evidence to establish the potential of TBA training to improve peri/neonatal mortality. Six studies were included, from Bangladesh, DRC, Guatemala, India, Pakistan, Zambia and Malawi. One cluster RCT in Pakistan (Jokhio et al. (2005)) compared the health outcomes of an intervention with trained TBAs versus untrained TBAs. The study found a significantly lower perinatal death rate in the trained versus untrained TBA clusters (adjusted OR 0.70, 95% CI 0.59–0.83), lower stillbirth rate (adjusted OR 0.69, 95% CI 0.57–0.83) and lower neonatal death rate (adjusted OR 0.71, 95% CI 0.61–0.82). This study also found that the maternal death rate was lower, but this was not significant (adjusted OR 0.74, 95% CI 0.45–1.22) [35]. Three out of five studies on *additionally* trained TBAs versus trained TBAs found no significant difference in the perinatal death rate between intervention and control clusters (one study [36], adjusted OR 0.79, 95% CI 0.61–1.02) and no significant difference in the late neonatal death rate between intervention and control clusters (one study [37], adjusted RR 0.47, 95% CI 0.20–1.11). The neonatal death rate, however, was 45% lower in intervention compared with control clusters (one study [37], 22.8% versus 40.2%, adjusted RR 0.54, 95% CI 0.32–0.92). A meta-analysis on two outcomes (stillbirths and early neonatal deaths) for three studies [36–38] proved no significant difference between the additionally trained TBAs versus trained TBAs. The authors concluded that the results are promising for some outcomes (perinatal death, stillbirth and neonatal death), but they come from only one study [22].

An older systematic review by Darmstadt et al. (2009) found low/moderate-quality evidence suggesting that TBA training may improve linkages with facilities and improve perinatal outcomes. The authors of this review also referred to the study by Jokhio et al. (2005) and a meta-analysis of three studies conducted by Sibley et al. (2004) [39], which demonstrated an 11% reduction in the intrapartum-related neonatal mortality rate [32].

Breastfeeding

Community Health Workers

There is evidence of moderate quality that LHWs probably increase the number of women initiating breastfeeding (RR = 1.34, 95% CI 1.13–1.59; $P = 0.0007$), who breastfeed their child at all (RR 1.19, 95% CI 1.07–1.33; $P = 0.001$) and who breastfeed their child exclusively for up to six months (RR 2.68, 95% CI 1.86–3.87; $P < 0.00001$), when compared to usual care [18]. Lassi et al. (2010) show that community-based interventional care packages improve the rates of early breastfeeding by 94% (RR 1.94, 95% CI 1.56–2.42, random-effects (six studies, $n = 20,627$), $I^2 = 97\%$, $P \text{ value} < 0.001$) [19]. Another Cochrane review on the effectiveness of support for breastfeeding mothers by various types of health workers also concluded that support by both lay supporters and professionals had a positive impact on breastfeeding outcomes [40].

A systematic review by Hall et al. (2011) on the promotion of exclusive breastfeeding by CHWs through community-based interventions has shown that community-based interventions can improve exclusive breastfeeding. Four studies from Syria, India, Pakistan and Bangladesh were included in this review. In two of the RCTs, CTC providers were providing the services to promote exclusive breastfeeding: TBAs, village-based workers and auxiliary midwives (in India) and female health workers and TBAs (in Pakistan) [41]. The effectiveness of CHWs in promoting appropriate feeding after six months of age, as measured by improvements in anthropometric measures, is minimal at best according to current evidence [3].

A systematic review on the effectiveness of Community Health Agents in Brazil documented their effectiveness regarding the frequency of child weighting, prevalence of breastfeeding and delayed introduction of bottle feeding [42].

The WHO also recommends the promotion of exclusive breastfeeding by LHWs [27].

Peer support

Sudfeld et al. (2012) conducted a systematic review and meta-analysis to examine the effect of peer support on the duration of exclusive breastfeeding in LMICs. Eleven RCTs were included. Significant differences were noted in study population, peer counsellor training methods, peer visit schedules and outcome ascertainment methods. Peer support significantly decreased the risk of discontinuing exclusive breastfeeding as compared to control. The effect of peer support was significantly reduced in settings with over 10% community prevalence of formula feeding as compared to settings with less than 10% prevalence. The effect of peer support on child health (diarrhoea) was not clear [43].

Jolly et al. (2012) conducted a systematic review with meta-analysis on the effect of peer support on any or exclusive breastfeeding in both high-income countries and LMICs. Peer support interventions had a significantly greater effect on any breastfeeding in LMICs ($P < 0.001$), reducing the risk of not breastfeeding at all by 30% (relative risk (RR) 0.70, 95% CI 0.60–0.82) compared with a reduction of 7% (RR 0.93, 95% CI 0.87–1.00) in high-income countries. Similarly, the risk of non-exclusive breastfeeding decreased significantly more in LMICs than in high-income countries: 37% (RR 0.63, 95% CI 0.52–0.78) compared with 10% (RR 0.90, 95% CI 0.85–0.97; $P = 0.01$). Furthermore, it was

found that peer support had a greater effect on any breastfeeding rates when given at higher intensity ($P=0.02$) and only delivered in the postnatal period ($P<0.001$), although no differences were observed of its effect on exclusive breastfeeding rates by intensity or timing [44].

Summary

In summary, a series of systematic reviews have examined the effectiveness of a range of CTC provider interventions targeted at improving neonatal health outcomes. They conclude that interventions for birth and newborn care preparedness, specifically those based on building community support groups, community mobilization activities and home visits by community-based workers, are effective in reducing total and early neonatal deaths. Reviews also conclude that there is still insufficient evidence about the effectiveness of training of TBAs in improving neonatal health outcomes in general. CTC interventions by CHWs involving the promotion of breastfeeding (health education, home visits to expecting mothers) are moderately effective in increasing the number of women initiating early breastfeeding, and exclusively breastfeeding for six months. However, their effectiveness in promoting appropriate feeding after six months of age is minimal. Peer support emerged as an effective strategy to reduce the risk of non-exclusive breastfeeding particularly in LMICs.

3.3 Family planning

Community-based distribution programmes have increased utilization of family planning services and decreased costs for clients (and increased convenience) when compared to facility-based services, particularly in rural areas. Malarcher et al. (2011) have conducted a systematic review concerning the provision of injectable depot-medroxyprogesterone acetate (DMPA) by CHWs. Nineteen documents were included (16 studies, from Bangladesh, Guatemala, Uganda, Bolivia and Ethiopia). All programmes recruited existing CHWs for training in the provision of injectable contraceptives. The percentage of male CHWs was between 15% and 26%. Training varied from 3 to 10 days. The results of this review provide consistent evidence that appropriately trained CHWs can screen DMPA clients effectively, provide injections safely and counsel on side-effects appropriately. Clients of CHWs receiving DMPA had outcomes equivalent to those of clients of clinic-based providers of progestin-only injectables. Clients were satisfied with community-based provision of DMPA, and trained CHWs were comfortable in their ability to provide DMPA. Uptake of community-based injectable services was significant in all the reviewed studies, indicating that the provision of injectable contraception by CHWs is acceptable in a wide variety of settings. Moreover, trends in contraceptive use show that the well-managed introduction of community-based injectable services is likely to contribute to increased contraceptive use overall, rather than just a switch of provider or contraceptive method. It was found that CHWs reached new users of family planning. In addition to the training of CHWs, many projects used a screening checklist to aid providers in the task of screening clients. The authors recommended that counselling should be improved in both community- and clinic-based services, as the quality was not optimal [45].

A systematic review by Denno et al. (2012) reviewed the effectiveness of community-based HIV and reproductive health service policies and programmes delivered via outreach on increasing health services utilization among adolescents and young adults. The review included both high-income countries and LMICs and did not have a focus on CTC providers, but on provision of services *outside*

a health facility. For LMICs, a programme promoting pharmacy over-the-counter-based access to emergency contraceptives in an urban setting was successful [46].

The recently published WHO recommendations on task shifting found insufficient evidence for the effectiveness of LHWs initiating and delivering injectable contraceptives and recommended initiation and maintenance of injectable contraceptives using a standard syringe by auxiliary nurses or ANMs, and in case of an LHW, only with targeted M&E. Insertion and removal of contraceptive implants are recommended for auxiliary nurses and ANMs only with targeted M&E [27].

Summary

There is evidence of the effectiveness of CTC providers in distributing oral contraceptives and promoting the utilization of family planning services. There is evidence of the effectiveness for the use of injectable contraceptives using a normal syringe by auxiliary nurses and ANMs, but not so for LHWs. WHO (2012) recommends that only in some settings and only under conditions of “targeted monitoring and evaluation”. LHWs can initiate and maintain injectable contraceptives using a normal syringe [27]. Counselling was identified as an activity that needed improvement. Other reviews suggest that provision of emergency contraceptives over the counter can be successful.

3.4 Child health

Child morbidity and mortality

Lewin (2010 and again in 2012) has shown low-quality evidence that LHW, when compared to usual care, may reduce child morbidity (RR 0.84, 95% CI 0.75–0.94; $P = 0.002$) and child mortality (RR 0.75, 95% CI 0.55–1.03; $P = 0.07$) and may increase the likelihood of seeking care for childhood illness (RR 1.19, 95% CI 0.91–1.55; $P = 0.20$) [18]. A systematic review on the impact of CHWs delivering curative interventions against malaria, pneumonia and diarrhoea on child mortality and morbidity in sub-Saharan Africa demonstrated varying impacts on child mortality, ranging from a 63% reduction to an 87% increase, with six out of seven studies showing a reduction overall, compared either with contemporaneous controls or in after-versus-before comparisons (see also below) [47].

Immunization

There is evidence of moderate quality that LHWs, when compared to usual care, probably increase immunization uptake in children (RR 1.19, 95% CI 1.09–1.3; $P < 0.0001$) [18]. The effectiveness of CHW interventions in expanding immunization coverage and especially in reaching priority, hard-to-reach groups is well documented in other reviews. A Cochrane review from 2011 that assessed the effectiveness of different strategies to improve immunization coverage found low-quality evidence that home visits may lead to small increases in the uptake of Oral Polio Vaccine 3 and measles vaccine when compared with routine immunization [48]. A systematic review by Glenton et al. (2011) shows promising benefits of LHW on child immunization coverage. The authors of this review identified five intervention models for LHWs in this field: provision of information and support by LHWs to parents/carers; provision of information and support by LHWs to the wider community; vaccine delivery by LHWs in the community; vaccine delivery by LHWs in primary health care clinics or hospitals; and LHW surveillance of immunization coverage. However, for many models, more high-quality studies are needed, particularly from LMICs [49]. One of the included studies in this review, Andersson et al. (2009), is most relevant for REACHOUT. In this RCT conducted in Pakistan,

LHWs promoted immunization uptake at a series of village meetings with selected community members. This was compared with no intervention. The LHW programme increased the number of children whose diphtheria, pertussis and tetanus (DPT) and measles immunizations were up to date. This evidence was of moderate quality. Andersson et al. (2009) suggest that coverage can increase in whole communities through structured discussions with selected members of these communities [50]. The review by Patel et al. (2010) suggests that CHW programmes may have a greater impact when compared to other strategies for expanding immunization coverage. However, higher-quality studies are needed to draw firm conclusions when comparing CHW programmes to other interventions and when comparing specific approaches within CHW interventions to expand immunization coverage [51]. Ryman et al. (2008) conclude that non-health workers can provide numerous services including education, mobilization and tracking of target populations regarding immunization programmes [52].

Community case management of serious childhood illnesses (pneumonia, malaria and diarrhoea)

Assessing the impact of CHW programmes designed to deliver curative interventions against malaria, diarrhoea or pneumonia along with their other activities has received surprisingly little attention, given the importance of the topic. Christopher et al. (2011) reviewed these and were able to identify only seven studies, but they demonstrated under-five mortality reductions of 63% to 87% relative to contemporaneous controls (in six studies) or in after-versus-before comparisons (one study) [3, 47]. Most studies included in the systematic review by Christopher et al. (2011) focused on malaria. More research is needed on pneumonia and diarrhoea. There is still little evidence from Africa on the effectiveness of CHWs delivering curative interventions against pneumonia, malaria and diarrhoea. Large-scale rigorous studies, including RCTs, are needed to provide policymakers with more evidence on the effectiveness of CHW programmes on child mortality [47].

Smith Paintain et al. (2012) found that evidence on CHWs' ability to diagnose and treat pneumonia is mixed. Findings suggest that strong practical training, clear guidelines and regular supportive supervision with opportunities for problem solving are critical for maintaining the quality of CHWs, especially for pneumonia treatment [53].

(Mal)nutrition

Cost-effectiveness analyses from Zambia and Malawi have confirmed that community-based management of severe acute malnutrition is a highly cost-effective approach [54, 55]. CHWs are used to distribute micronutrients to households, which is proven to be effective by several studies [3].

Summary

In summary, there is evidence of the effectiveness of LHW interventions in expanding immunization coverage in priority, hard-to-reach groups; there is also evidence that they may also be effective in increasing immunization uptake in general. Glenton et al. (2011) [49] identify the need to further test the following five intervention models: provision of information and support by LHWs to parents/carers; provision of information and support by LHWs to the wider community; vaccine delivery by LHWs in the community; vaccine delivery by LHWs in primary health care clinics or hospitals; and LHW surveillance of immunization coverage. Similarly, there is definitive evidence of

the effectiveness of community-based management of severe acute malnutrition by CHWs, in the form of CHWs promoting and distributing micronutrients.

Evidence shows that LHWs may help increase the likelihood of seeking care for childhood illnesses. However, the effectiveness of LHW interventions, including community case management of serious childhood illnesses (pneumonia, malaria and diarrhoea), in reducing child morbidity and mortality is uncertain, especially regarding pneumonia and diarrhoea.

3.5 HIV and AIDS

Community Health Workers

Mwai et al. (2013) did a systematic review of quantitative and qualitative studies and focused on the role and outcomes of CHWs in HIV programmes in sub-Saharan Africa. Twenty-one studies were included, of which five qualitative studies, seven cohort studies, six mixed-methods studies and three RCTs. The review, using a narrative synthesis approach, found that CHWs are performing a variety of roles, including counselling, HIV testing, home-based care, education, adherence support, livelihood support, screening, referral and surveillance activities. The authors concluded that CHWs can increase the uptake of HIV services and play an important role in supporting retention in care through defaulter tracing, adherence counselling, mobile reminders and collecting drugs from clinics. Patients who had been exposed to adherence support from CHWs had the same or less likelihood of virological failure in four studies (including two RCTs). The authors, furthermore, concluded that CHW outcomes were not inferior to those of health professionals [56].

Decroo et al. (2013) reviewed studies on community-based antiretroviral therapy (ART) programmes in sub-Saharan Africa. Eighteen studies of different nature were included in the review. In all studies the responsibilities of lay ART providers included ART delivery in the community, provision of adherence support and referral of sick people to the clinic. In most programmes, lay ART providers were remunerated CHWs or peer CHWs who delivered ART at the homes of people living with HIV and AIDS (PLWHA). However, two programmes engaged non-remunerated lay ART providers. All outcomes provided positive evidence in support of community-based ART programmes. In all comparative studies, patients had similar outcomes to patients in facility-based care [57].

Wouters et al. (2012) conducted a systematic review combined with a realist review on the contribution of community mobilization to ART programmes in resource-limited settings. CTC providers were CHWs (11 studies); community care coordinators (people living with HIV and AIDS (PLWHA) who are trained to perform CHW tasks) (two studies); peer health workers (also PLWHA trained as CHW) (three studies); field officers (trained lay persons who support drug delivery and monitor patients, they have often formal education on social science or education) (four studies); Health Extension Workers (HEWs) (two studies); HIV and AIDS lay counsellors (four studies); community members employed for Directly Observed Treatment (DOT) for ART (two studies) and adherence supporters (six studies). All of them had been trained in the intervention. Although the differing research designs did not allow the available evidence to be statistically compiled, the synthetic review demonstrated that community support initiatives can positively impact ART programme outcomes in resource-limited settings. The reviewed literature reported an unambiguous positive impact of community support on a wide range of aspects, including access

and coverage, adherence, virological and immunological outcomes, and patient retention and survival. Regarding the contributory role of community-based workers in ART, it was found that they: have the ability to integrate HIV and AIDS care into the general primary health care system; have the capacity to broaden HIV and AIDS care beyond mere medical care tasks, by providing support and counselling; help patients to develop self-management skills that are needed to take well-informed decisions regarding their health and treatment, as well as articulate their needs and negotiate with health providers in the public sector about their rights and the quality of treatment they receive; have the ability to reach out into the community and prevent loss-to-follow-up or track defaulting patients; and can be helpful in addressing the human resources for health crisis [58].

However, a Cochrane review that assessed the effectiveness of home-based care to reduce morbidity and mortality in people infected with HIV (Young et al., 2010) was able to include only one study from a LMIC (Uganda) out of 15 studies included. Studies were generally small, and there was a lack of studies truly looking at the effect of home-based care itself or looking at significant end points (death and progression to AIDS) [59].

Suthar et al. (2013) conducted a systematic review and meta-analysis of community-based approaches in voluntary HIV testing and counselling. Some 117 studies met the inclusion criteria. Community-based approaches increased uptake of HIV testing and counselling (RR 10.65, 95% CI 6.27–18.08), the proportion of first-time testers (RR 1.23, 95% CI 1.06–1.42) and the proportion of participants with CD4 counts above 350 cells/ml (RR 1.42, 95% CI 1.16–1.74), and obtained a lower positivity rate (RR 0.59, 95% CI 0.37–0.96), relative to facility-based approaches. The authors concluded that HIV programmes should offer community-based HIV counselling and testing linked to prevention and care, in addition to facility-based HIV counselling and testing [60].

The review by Denno et al. (2012) mentioned earlier also found that home-based HIV counselling and testing in rural settings in LMICs was successful [46].

Peer support

A systematic review and meta-analysis conducted by Medley et al. (2009) assessed the effect of peer education interventions on HIV knowledge, injection drug equipment sharing, condom use and sexually transmitted infections in developing-country settings. In meta-analysis — despite generally weak study designs — peer education interventions were significantly associated with increased HIV knowledge (OR: 2.28, 95% CI: 1.88–2.75), reduced equipment sharing among injecting drug users (OR: 0.37, 95% CI: 0.20–0.67) and increased condom use (OR: 1.92, 95% CI: 1.59–2.33). Peer education programmes had a non-significant effect on sexually transmitted infections (OR: 1.22, 95% CI: 0.88–1.71). This indicates that peer education programmes in developing countries are moderately effective at improving behavioural outcomes but show no significant impact on biological outcomes [61].

Summary

In summary, there is evidence of the effectiveness of CTC providers providing community support on a wide range of aspects of HIV programmes: improving access and coverage, adherence, virological and immunological outcomes, patient retention and survival. There is also evidence that peer education programmes delivered in developing countries by peers who have received a similar level

of training as CHWs are moderately effective at improving behavioural outcomes but show no significant impact on biological outcomes.

3.6 Tuberculosis

Currently, there is evidence of moderate quality (when comparing LHW programmes with usual care) that LHWs probably improve pulmonary tuberculosis (TB) cure rates (RR 1.22, 95% CI 1.13–1.31, $P < 0.0001$) and that LHWs probably have little or no effect on TB preventive treatment completion (RR 1.00, 95% CI 0.92–1.09, $P = 0.99$) [18].

The involvement of CHWs and other community members in facilitating Directly Observed Treatment, Short-Course (DOTS) can substantially increase treatment completion rates and reduce patient and societal costs, relative to facility-based services. Numerous studies have demonstrated that community-based care for TB is more cost-effective than other forms of care [62].

3.7 Malaria

Christopher et al. (2011) reviewed CHW interventions on child health regarding malaria, pneumonia and diarrhoea (see Section 3.4). A systematic review by Smith Paintain et al. (2012) assessed published and unpublished evidence on the effectiveness, cost-effectiveness, equity and sustainability of strategies to increase demand and uptake and improve the quality of community-based diagnosis and case management of malaria in Africa. The CTC providers in the included studies were community drug/medicine distributors (CDDs/CMDs), CHWs, community health volunteers, health surveillance agents, community implementers, community-owned resource persons, women leaders and mother coordinators [53]. The majority of the studies were conducted at a time when national policy called for presumptive diagnosis of malaria by CHWs. However, there is a growing evidence base for the ability of CHWs to use Rapid Diagnostic Tests (RDTs) and treat appropriately according to the result, with 11 studies reporting data on RDT use. Likewise, around 60% of studies involved the use of Artemisinin Combination Therapy (ACT) by CHWs. This review, therefore, presents a useful update of the current policy context to the 2007 review by Hopkins et al. which could only draw on published literature on presumptive treatment of malaria by CHWs using Chloroquine (CQ), Sulfadoxine-pyrimethamine (SP) or CQ-SP [63].

Hopkins et al. (2007) included six trials in their systematic review. Heterogeneity of the evaluations precluded meta-analysis. Conclusions regarding the impact of home-based management of malaria (HMM) on morbidity and mortality end points were mixed. Two studies showed no health impact, while another showed a decrease in malaria prevalence and incidence, but no impact on mortality. One study in Burkina Faso suggested that HMM decreased the proportion of severe malaria cases, while another study from the same country showed a decrease in the risk of progression to severe malaria. Of the four studies with mortality end points, only one from Ethiopia (Kidane et al. (2000) showed a positive impact, with a reduction in the under-five mortality rate of 40.6% (95% CI 29.2–50.6) [64]). A discussion paper from Uneke et al. (2009) concludes that HMM plays a contributory role in reducing progress to severe malaria and overall childhood mortality [65].

Smith Paintain et al. (2012) included several more recent RCTs and found a mixed clinical impact. For example, studies conducted in Burkina Faso and Tanzania used models of training women leaders in intervention villages to educate neighbouring mothers and provide malaria treatment [66, 67]. Both found that although moderate anaemia decreased in the intervention villages, it also decreased in control villages over the intervention period, suggesting that broader health improvements may have been responsible, rather than the CHW intervention itself: in Burkina Faso prevalence of moderate anaemia decreased from 28.0% to 16.7% in intervention villages, and from 29.9% to 14.5% in control villages ($p=0.32$) [67]; in Tanzania the reduction was from 43.9% to 0.8% in intervention villages, and from 30.8% to 0.17% in control villages ($p=0.04$) [66]. Three of the four sites that participated in the Special Programme for Research and Training in Tropical Diseases multi-country study of ACT use for HMM investigated polymerase chain reaction (PCR)-adjusted cure rates of a sub-sample of patients treated with ACT by a CHW. Twenty-eight days after treatment, 90.9%, 91.4% and 97.2% of patients had cleared their original infections in the sites in Nigeria, Ghana and Uganda, respectively [68], suggesting that ACT can be effectively administered by CHWs and adhered to by the users of these services.

In the most recent systematic review (Smith Paintain et al. (2012)), a high level of adherence by CHWs to the correct dose of anti-malarial was seen across the vast majority of studies, irrespective of diagnosis or anti-malarial policy or strength of study design; in large part this is due to the benefit of pre-packaged anti-malarials and sufficient practical, interactive training techniques. Prompt and correct treatment of malaria is less consistent and tends to be lower. Community mobilization towards prompt treatment seeking should be emphasized. Larger-scale studies with less external support had more modest results for prompt and effective treatment of malaria than more rigorously controlled research studies. CHWs also demonstrated high ability to safely use RDTs and adhere to results, prescribing ACTs for the majority of RDT-positive patients (and minimum ACT prescription for RDT-negatives); challenges remain with action to take for RDT-negative patients [53].

Summary

In summary, there is some good, though yet insufficient, evidence that it is possible to substantially reduce malaria-related under-five mortality where CHW interventions involve the promotion of prompt treatment-seeking behaviour and/or delivery of insecticide-treated nets or anti-malarial chemoprophylaxis. There is also some evidence of the effectiveness of interventions where CHWs apply RDTs and prescribe ACTs to RDT-positive patients.

3.8 Mental health

There is a lack of evidence on the effectiveness of CTC providers in mental health. Only one review of low quality was found on the effects of community-based models on health outcomes of adults with depression, schizophrenia, panic disorder or bipolar disorders in LMICs. The 17 interventions included in this review in 14 countries show us that community-based mental health services can provide improvements in mental health outcomes, and the limited cost analyses suggest cost savings associated with community models of care [69].

4. Factors influencing the performance of CTC providers

This chapter presents the findings of the literature review regarding objective 2: to identify contextual factors that form barriers to or facilitators of the performance of CTC providers and their services. The chapter begins with a short explanation of the conceptual framework that was developed in the first stage of the literature review and a brief overview of the literature search. This is followed by a presentation of the findings categorized based on the framework. Thus, we depart from the categorization based on the type of programme used in Chapter 3, as the factors influencing CTC providers' performance are generally similar across the types of programmes. For each category, we first present our findings from the literature and briefly summarize the key findings. Where possible and appropriate, we distinguish between different types of CTC providers. In the next chapter, we compare and contrast our findings with those of other reviews on the same or similar subject and, ultimately, discuss the implications for further REACHOUT work.

4.1 Conceptual framework

The initial conceptual framework that was developed in the first stage of this literature review is presented in Figure 1. This framework was developed based on an initial review of literature on CTC providers and a review of other frameworks which have outlined the factors influencing the performance of CTC providers and their impact on the health and well-being of the population they serve [4, 13, 70-74]. This a priori framework served as the basis on which we interrogated the literature to achieve the review objectives. The framework divides the factors influencing the performance of CTC providers into three categories:

- broad contextual factors, which include:
 - community context (social networks, gender norms, cultural practices, beliefs);
 - political context (type of policy, security); and
 - other contextual factors (legal system, environment, economy);
- health system factors; and
- intervention design factors.

Factors to the left of the framework, such as health system factors, have a direct influence on aspects immediately to their right — for example, intervention design factors — and either a direct or indirect effect on aspects further to the right, including the performance and impact of CTC providers. For example, a lack of a policy and coordination mechanisms (health system factor) for the focus and implementation of CHW programmes influences the likelihood of avoiding overlap in the design of a programme, may lead to CHWs carrying multiple workloads for various projects and programmes and affects the potential workload, motivation, competences and quality of the CHWs' work. Broad contextual factors can influence other factors (health system, intervention design factors) but also directly influence CTC providers' performance and impact.

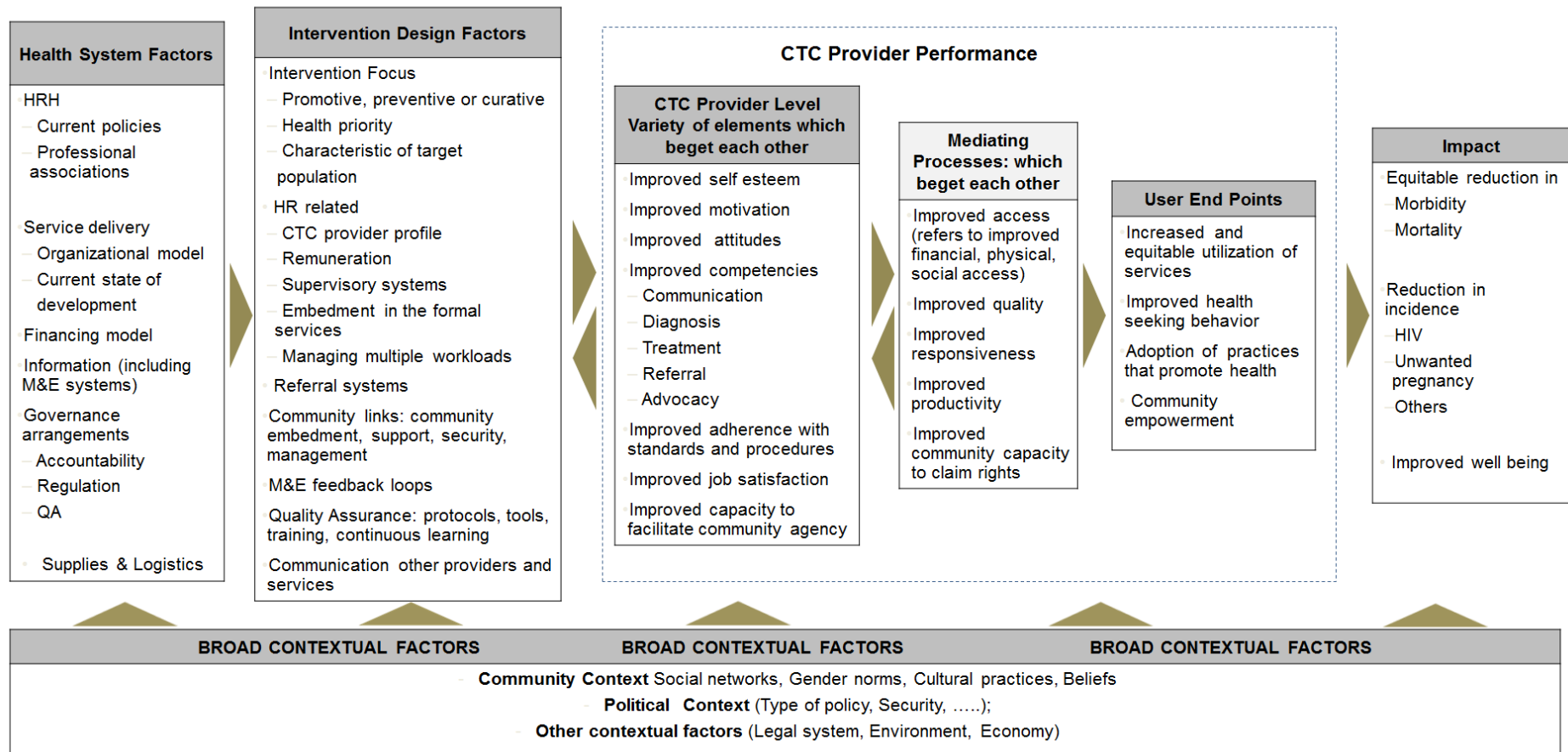


Figure 1. Conceptual framework

The framework places CTC providers' performance at its centre, as this is our research focus. In the framework, we have distinguished CTC providers' performance across three categories: the first involves changes that occur at the provider level, which translate into improved performance in terms of specific user-level end points (the third category presented in the framework) but do this (partly) through a set of mediating processes (the second category). Improved CTC provider performance ultimately translates into improved population health and well-being. Our reading of the literature shows that papers report outcomes related to CTC providers' performance at these three levels, or at impact level; we think that it is important to distinguish across these outcome levels, as the factors influencing these would be different.

Factors influencing CTC providers' performance

Broad contextual factors, as outlined above, include community context (social networks, gender norms, cultural practices and beliefs), political context (type of policy, security) and other broad contextual factors such as the legal system, the environment and the economic situation [75].

Health system factors are based on the six (WHO) health system building blocks. While we explored the possibility of using other health systems frameworks to organize this section, we thought (and this was later confirmed by the review) that the six building blocks offered sufficient space to accommodate almost all possible health system factors that might affect the performance of CTC providers.

Within the *intervention design factors*, first of all the intervention focus is presented as an aspect that can have an influence on CTC providers' performance. It includes the nature of the intervention (promotive, preventive or curative), the health priority or priorities that it is aiming to improve and the characteristics of the target group. The human resources-related sub-factors could include many more than currently presented, such as: different kinds of incentives (monetary, material and immaterial), CTC provider–client ratio and the CTC provider recruitment process. However, for clarity's sake, we have minimized the detail presented in the framework. Referral systems are presented as an intervention design factor, as clear and functional referral systems enable CTC providers to refer effectively and efficiently and improve performance outcomes. Community links are also categorized under intervention design factors — for example, the extent to which the intervention is embedded in the community structures, situation and decision-making, the way community support is built into the implementation of the intervention and security and management systems. An intervention's M&E system allows learning from implementation and can result in adjustments. Quality assurance aspects, such as making sure that interventions are delivered based on protocols, training and continuous learning, can also directly affect CTC providers' performance. Lastly, communication with other providers and services is an important aspect within the intervention design that could influence the performance of the CTC providers and their services [9].

CTC providers' performance

As explained above, from our initial reading of the literature we found that the performance of CTC providers can be considered at three levels (provider level, mediating processes, and in terms of user end points), or at impact level; we think that it is important to distinguish across these outcome levels, as the factors influencing these would be different. In addition, even within the CTC provider

performance box in the framework diagram, parts to the left have a direct influence on parts immediately to the right, and either a direct or indirect effect on aspects further to the right, including on impact. Thus, changes at the CTC provider level, while often reported as proxy end points for many human resources interventions, are also necessary factors to improve CTC providers' performance in terms of specific user-level end points. These changes at the CTC provider level are: improved self-esteem, motivation, attitudes, competencies (to have adequate communication, diagnosis, treatment, referral and advocacy), adherence with standards and procedures, job satisfaction (which is related to motivation mostly) and the capacity to facilitate community agency.

If factors at CTC provider level are improved, this could result in better performance. It could result in improved access, quality, responsiveness, productivity and community capacity to claim rights. However, these mediating processes are not only influenced by CTC provider factors but also by health system, intervention design and broad contextual factors (bypassing the CTC provider level). For example, access refers to financial, physical and social access; these could be an effect of the performance of CTC providers but could also include health-system-level preconditions that need to be met for CTC providers to be able to perform effectively. Similarly, the quality, responsiveness and productivity of other providers and the community's capacity to claim rights could both be an effect of CTC providers' performance or be preconditions that need to be met for CTC providers to be able to perform.

4.2 Literature research

The literature search yielded 457 single studies that were read (348 references from the search and 109 references from hand searching). A total of 150 studies fulfilled the selection criteria and were included in the review regarding objective 2. An overview of the included studies is presented in Annex 4. For a flowchart of the search results, see Figure 2.

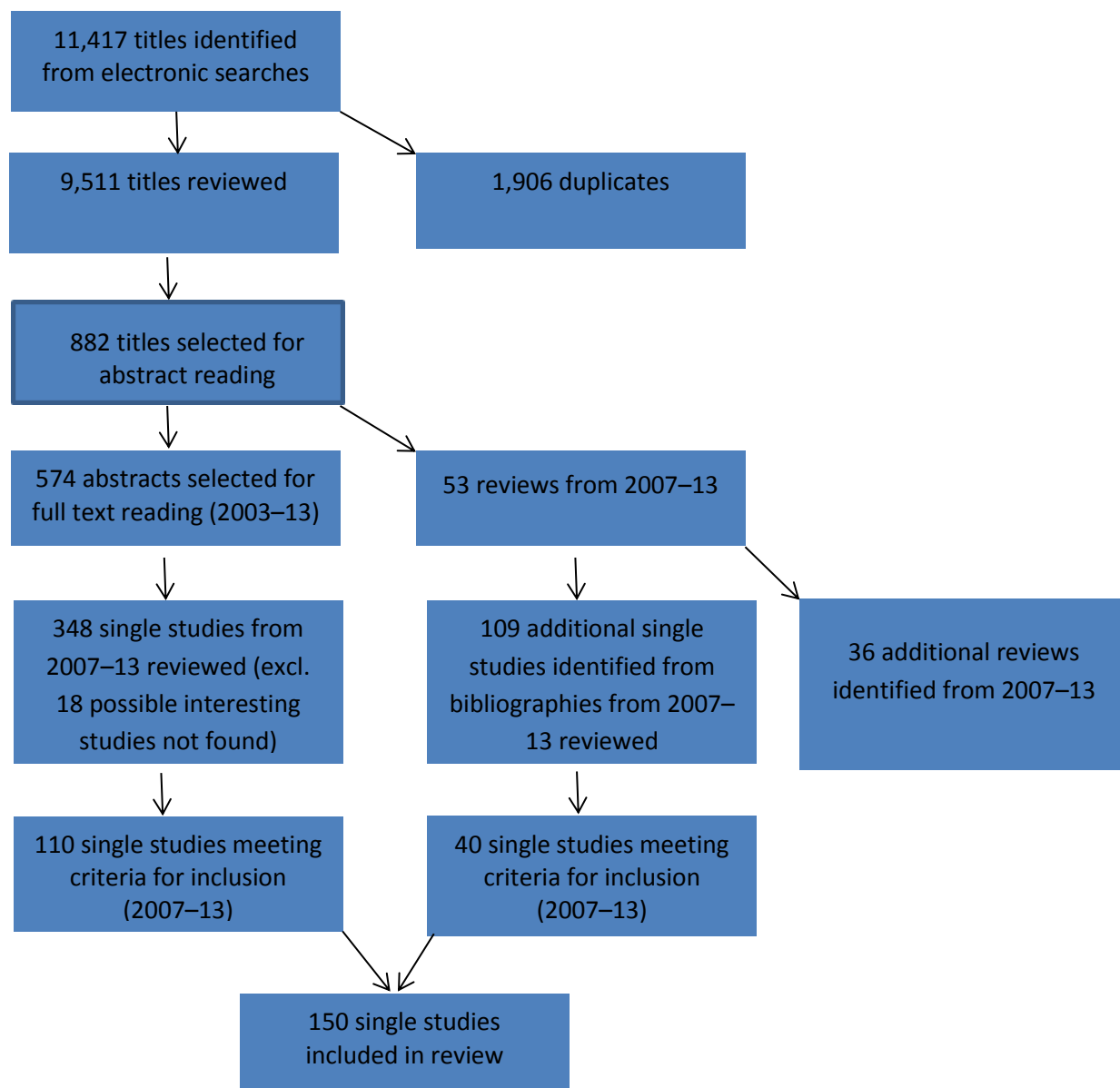


Figure 2. Flow chart search results

4.3 Broad contextual factors

4.3.1 Community context

From the literature reviewed the following community-related factors were found to have a bearing on the performance of CTC providers and/or on the effectiveness of CTC interventions.

Gender roles and norms

Gender roles and norms influence the effectiveness of provider interventions and form barriers to achieving desired outputs in various ways [76-80]. Gender roles and norms may play an important role in the interaction of CHWs with the community. For example, in Muslim societies such as Nigeria [81], Bangladesh [82] and Afghanistan [80], women's mobility is restricted, and they lead

secluded lives at home; this limits their health-seeking possibilities. In these cultures, CTC services can provide good access to health care, because services are delivered on people's door step [82]. In Nepal, entrenched social and cultural norms around menstruation specifically, and the gender norms in general, also affected the effectiveness of the intervention [76]. Difficulty in access to care was also shown in Malawi. In a pilot intervention using CHWs to create a continuum of care in the prevention of mother-to-child transmission of HIV cascade of services, women without any partner involvement were most likely to complete the cascade. Those women with involvement but undisclosed partners were least likely [83]. A study in Bangladesh reported that some women faced problems when asking their husbands or in-laws to join a women's group [38]. In Swaziland, context-specific limitations on women's agency and decision-making formed a barrier to HIV prevention and care interventions by caregivers. Certain practices exacerbated the vulnerabilities many women face in their lives. These included wife inheritance, polygamy and male sexual and reproductive entitlement to wives' younger sisters. They were home-based practices, moreover, that constitute the home (an extended family homestead) as an organizing principle of Swazi life [78].

Gender perceptions can influence people to become or remain a CHW. Often, men are considered to be the breadwinner who needs money to provide for his family. A study in Kenya showed that for this reason it became difficult for male CHWs to provide free services. This cultural norm was not the only reason for the higher drop-out of male CHWs; it was also indicated that men lacked certain characteristics such as an instinct for the tender care and tolerance that a sick person requires, whereas female CHWs believed 'it is their natural duty' to care. Women are often seen as the caring type and ought to take care of the household. A lack of remuneration and a lack of spousal support (women were perceived to 'waste time') were reasons for female CHWs to drop out [84]. In Papua New Guinea too, female CHWs felt under pressure to provide an income for the family while doing CHWs work and catering for all other domestic tasks at the same time [77].

Social and cultural norms and values

A number of studies cover the influence of general social cultural customs and relationships. In many societies, the husband and mother-in-law are the primary decision-makers, both having their own distinct domain over which they control decision-making [85]. Two different studies on maternal health carried out in Afghanistan and Bangladesh showed that involving the husbands [86, 87], mothers-in-law [86, 87], sisters-in-law and mothers [87] in the education process reinforced the messages of CTC providers and enhanced the coverage and acceptability of misoprostol.

Prata et al. (2012) stated that in their study area in Nigeria the social structures were extremely hierarchical and that local leaders had a strong influence. Politically, this required consultation with these leaders prior to any health intervention or project. However, the facilitation of cooperation between local leaders and lay community members outside the religious domain was extremely difficult, making even moderate grassroots participation in the design and testing of health interventions an elusive goal. Moreover, the meaning of higher levels of community participation would be muddled in such circumstances, since, once sanctioned by local leaders, interventions and activities are expected to be accepted by the local population [81].

Faith-based religious norms and values and social hierarchies also influence interventions. Root et al. (2011) report results of interviews with caregivers and clients that identify 'Christian ethos' of 'talk

and love' as facilitators of caregivers' tasks and having an effect on disclosure and stigma. Social hierarchies influence the ability of CHWs to improve access to services for women from all social classes [78].

The ability of CHWs to bring services closer to communities is often assumed to improve when involving CHWs from the community. For example, In Mali, 'matrons' are a bridge between modern biomedical medicine and traditional practices [88]. However, social hierarchies may also form a barrier. From India, Abbott et al. (2011) report that women from upper castes established an easy relationship with middle- and higher-caste women but had real problems making services accessible for women with a significantly lower social status [89].

Community acceptance, trust and respect

Multiple authors describe community acceptance, trust and respect as non-financial motivating factors to become or remain a CTC provider, as well as factors that enhance the performance of CTC providers [77, 90-100].

Community acceptance, trust and respect as an incentive

In a study involving care facilitators for HIV home-based care in Zimbabwe, Osawa et al. (2010) state that the more communities accept, appreciate and support CHWs in their activities, the more the CHWs are motivated to perform [101]. A study conducted by BRAC in Bangladesh showed that these positive responses — such as enjoying more social prestige and community approval — resulted in CHWs that were three times more likely to remain in their role [102]. Social rewards included, for example, more greetings, more honour and more participation in decision-making [90]. This social prestige might be more valuable in rural settings because of the existence of more stable and known communities (compared to unstable urban slum communities) [90, 103]. However, if things go wrong, CHWs also carry the burden of responsibility more often [103].

In some cases, social rewards are culturally determined. One example is that the greatest social reward many TBAs in Gambia appreciated was the recognition given at the naming ceremony when they participated in shaving the baby's head and carrying it to the elders for prayers [104].

In addition to social rewards, achievements such as seeing the health and education of the community improve were reported to be a motivating factor to become or remain a CHW [94]. A lack of recognition and getting back too little from the community in return for their work had a negative impact on motivation [104, 105].

Community acceptance, trust and respect enhancing CTC providers' performance

Shah et al. (2010) refer to the importance of the beneficiary community's acceptance of the intervention and of CHWs regarding their performance [106]. A good example of how community acceptance can be achieved is the implementation of a community-directed intervention (CDI) in Tanzania. The implementation involved addressing different major processes, from stakeholder processes, health system dynamics, engaging and empowering communities and engaging CDI implementers to the broader system effects. Community changes as well as health systems changes were triggered such that the inherent value of community involvement and empowerment could be internalized by communities and health workers, leading to a more receptive health system and

acceptance of the CDI process at the community level [107]. In India, community members learned about the Accredited Social Health Activist (ASHA) programme long after the programme commenced. Because of this, they often failed to understand the programme and had no say in their ASHA's role. The lack of understanding and input contributed to mistrust and conflict between villagers and ASHAs and dissatisfaction with the programme [108]. Also, in Bolivia mistrust because of failure of district health authorities and local leading groups to advertise the role of *Manzaneras* (CHWs) was hindering their work in promoting basic hygiene and preparing and transferring pregnant women to health facilities [109].

Another example comes from Guinea, where the Village Health Committee (VHC) was a vital player in the child survival project and the integration of (community-based) family planning work. The VHC comprised seven to nine members, each a permanent resident of his or her village and respected by the community as a whole. The VHC comprised selected local leaders, representatives of traditional health workers (birth attendants and healers), family planning promoters, a village nutritionist and HIV and AIDS peer educators. Members of the VHC were trained to conduct health promotion activities, organize health system outreach visits and maintain the community-based health information system. In addition, one man and one woman from each VHC were trained as Community-Based Distributors, supervised by the VHC and the local health centre. They were trained in family planning policies and promotions, sales, referrals, sexually transmitted infections and HIV and AIDS, and improving relations with health facility workers. Evaluation of the programme reported that "because the VHC is composed of respected members of the community, its guidance is taken very seriously". Both the VHC and the Community-Based Distributors, coming from and representing the community they serve, were seen as an accepted channel for health promotion [110].

In an HIV capacity-building project in the youth sector in Lao PDR, the effectiveness of the project was greatly enhanced by the inclusion of older people and village authorities. Their support was reported to be important, given the influence they have on young people and what activities are permitted to take place in the village [111].

Community expectations

Sometimes the community can have different interests that are not compliant with the tasks and responsibilities of CTC providers. CTC providers gain more respect in general if they are able to prescribe drugs [2], but sometimes this could lead to expectations that could not be met. In Malawi, Health Surveillance Assistants (HSAs) working in community case management of childhood illnesses were asked by community members also to treat adults, which was not included in the programme. This could lead to problems for the HSAs [92]. Kalyango et al. (2012) also refer to a lack of community appreciation for age restrictions, which had a negative impact on the performance of CHWs in Uganda. In the same study, the community's confidence in the medicines used by the CHWs was reported to enhance the CHWs' performance, whereas non-compliance with referral was hindering performance [112]. Furthermore, conflicts between CHWs' competences and community expectations as well as forcing or favouring behaviour were reported as challenges. Another study from Uganda discussed problems that were foreseen in the future of the programme, including adults forcing CMDs working in malaria to treat a child even when the child needed referral, forcing CMDs to test them for malaria while this was not part of the programme, and community leaders

seeking favours for themselves and their families [113]. Also, in Ethiopia the community expected more curative services than CHWs could provide [114, 115].

Community ownership and support

The support of the community, either in formal structures (such as a health council) or informal ways (for example, the community's acceptance of the intervention or CHWs, as described above) influences the performance of CHWs. In Papua New Guinea, people involved in community-level facilities such as schools, churches and church groups helped the CHWs to address various health problems. Especially the Community Health Boards (CHBs), which are linked to many health centres, positively influenced the performance of CHWs and their motivation. CHWs observed significant changes in community support since the establishment of the CHBs, which made it easier for them to deliver outreach services, particularly health-promoting activities. The authors suggest that CHBs play an important role in ensuring accountability and transparency in CHWs' performance [77]. In an HIV and AIDS alliance project in Uganda, community ownership was thought to be increased by the fact that services were delivered by people living with HIV themselves [116].

Different authors stress the essence of involvement of the community in selecting, supervising and supporting CTC providers.

Selection of CTC providers

Without further specification, a study on home-based management of malaria in Sudan stated that the role of the community in selecting its Malaria Control Assistants (who are CHWs) was found to be important [117]. Several studies reported the importance of selecting CHWs from the community itself, to enhance their performance. Examples we found in the literature are matrons in Mali [88] and volunteer CHWs in Uganda. The programme in Uganda trained volunteer CHWs in providing health information to families with children under five and encouraging families to attend national children's health days and outreach activities by health workers. For the selection process, special community health worker selection meetings were held in different villages. Community members identified their own criteria for selection, such as desirable qualities, experience, education level, marital status and age. In the end, each village selected two volunteer CHWs. The community's choice of volunteers and, thus, its involvement in the selection process was stated to be one of the programme's success factors [118].

Just as selection by the community enhances a programme's links with the community, its representativeness and community support, it also increases the motivation of CHWs. Community-Based Surveillance Volunteers (CBSVs) in the Northern region of Ghana indicated that being selected by the community influenced their sense of duty as well as their pride in the role and their motivation. Almost all CBSVs were selected by their communities and chiefs; this selection was seen as a sign that the community believed that they could undertake the role and that it was their duty to accept it [94].

In India the selection procedure of ASHAs involved guidelines with selection criteria, recommending that the selection of ASHAs should be done in a rational way adhering to criteria and with the active involvement of the community. However, the community's involvement in the selection process was not at the desired level. Village health and sanitation committees had not been established or

regular meetings were not held [119]. Another study from India also reported that ASHAs were often selected by government health workers without community consultation and were seen as entirely accountable to them, especially since they collected their remuneration from the primary health centre [108].

Villagers in Gambia used criteria provided by the government (such as having at least produced one child of her own) to select a potential candidate to be trained as a TBA. However, sometimes politicians misused their power and influenced the process of TBA selection by appointing their own relatives or friends, thus ignoring community participation [104].

Another example of community selection that did not work out comes from a home-based management of fever/malaria programme involving voluntary drug distributors in Uganda. The programme was designed to follow a systematic consultative and participatory process involving different stakeholders at the national, district and community levels. However, there had been limited time for consulting the community, discussing its needs, understanding its perceptions and agreeing on the role it was supposed to play in implementing and sustaining the programme. The rapid scale-up did not allow for community dialogue and community empowerment. The authors concluded that this could limit the effect of the project, in terms of utilization of malaria drugs, especially among the poorest people, which are often the most difficult to reach. They also discussed that the sustainability of the voluntary drug distributors would remain a challenge as long as there is little community commitment to support them [120].

Community support

In various studies, the supportive role of the community in facilitating the activities of CHWs and the project was highlighted [112, 121]. In rural Pakistan, for instance, community-based interventions for improving perinatal care using Lady Health Workers (LHWs) and *Dias* (TBAs) that were delivered within the regular government LHW programme was supported by the creation of voluntary community health committees. LHWs, with the help of two community mobilizers, identified community volunteers, who helped to set up community health committees for maternal and newborn care in their villages in close liaison with LHWs. These committees supported LHWs in conducting three-monthly group education sessions in the intervention villages and helped to establish an emergency transport fund for mothers and newborns. At the evaluation of the project, 150 women (38%) in the intervention villages who were interviewed reported that the village community health committee had played an important supportive and facilitative role during pregnancy and childbirth [122].

In Mozambique, CTC providers had regular meetings with local authorities, community leaders and health volunteers to assess the main health problems identified by the community and to devise strategies to address these problems [123].

Furthermore, in Ethiopia the involvement and support provided by community anchors enhanced the credibility and acceptance of voluntary CHWs and stronger adoption of improved health practices. Voluntary CHWs were community members who were trained to become 'model' families. They were responsible for over 25 to 30 households in their community to whom they promoted positive health practices through household visits. The project sought to strengthen community

support for voluntary CHWs by mobilizing various local institutions to serve as ‘community anchors’ for the community health programme. Specifically, the project has involved community anchors in raising the community’s recognition and acceptance of voluntary CHWs, supporting their goals and activities and sustaining their motivation levels. The local institutions that the project has mobilized as community anchors have included churches, mosques, *idirs* (burial associations) and women’s associations [91].

In a project in Mozambique a community-based vital registration and health information system for routine surveillance of births, deaths and childhood illnesses was instituted using an extensive network of 2300 volunteers. Community structures such as the village health committee and pastors played a critical role in supporting community-wide initiatives to promote the activities of the volunteers involved in the project. These activities included mobilizing the women for immunization, latrine construction, distribution and promotion of insecticide-treated nets and dissemination of health messages to the entire community [121].

Another way in which community members can be involved in community health projects and influence the performance of CTC providers is through a guardian function. Puchalski Ritchi et al. (2012) reported that LHWs in Malawi, part of the Malawi National TB Programme, were supported by guardians. The task of guardians, who are trusted members of the patient’s community, was to directly observe the patients taking their medication each day. Good guardians were acknowledged to improve patient adherence. However, for different reasons, guardians were ineffective and did not fulfil their roles. In some cases, guardians lived far away from the patient or only acted when the patient was feeling unwell. Guardians were described as acting as barriers to adherence, as they also failed to provide the necessary instrumental support (such as providing the patient with food/water to take medication). Also, the use of too many different guardians for one patient, resulting in patients receiving conflicting instructions and misunderstandings, was mentioned as hindering performance [124].

Community supervision

We did not find many studies reporting on community involvement in the supervision of CTC providers. Elmardi et al. (2009) stated that the involvement of villagers in supervising and supporting a project for home-based management of malaria in Sudan was of great value in keeping the project going [117]. Prytherch et al. (2012) addressed the value of community experiences with community-based programmes and mentioned that community feedback could be better integrated into quality improvement and performance appraisal processes [103]. Kalyango et al. (2012) reported that support from the community in the form of feedback and rewards was found to have a greater influence on CHWs’ performance than that from the health system [112].

Safety and security

In a study describing the social factors that influence the motivation of rural health workers in Papua New Guinea, work safety issues were addressed. Personal safety might affect performance and motivation to work at particular locations and, in some cases, resulted in people resigning. Especially (young) female health workers felt unsafe and scared because of substance abuse among young men and violence such as assaults, verbal abuse and accusations. The authors suggest that a supportive relationship with the community in which the community is protective of the service and

respects health workers and the services offered is important. Other factors, such as having a police station adjacent to the health facility and proactive priests acting as mediators within the community, might help CTC providers to feel safe [77].

Disease-related stigma

Another factor influencing the performance of CTC providers was stigma. In a project involving peer counsellors acting as a role model, raising awareness and supporting patients to adhere to ART in Ethiopia and Uganda, the unwillingness of patients to give their correct address and phone number — out of fear of having their HIV status known when receiving a visit — limited the work of peer counsellors [125, 126]. HIV-related stigma was also mentioned as affecting CTC providers' performance in Kenya [127].

Summary

Many community-related factors influence the effectiveness of both CTC providers and CTC interventions. These can be general or can also depend on the condition being targeted by the CTC intervention. For example, gender norms around women's mobility or around menstruation affect both female CTC providers' performance and also the effectiveness of any intervention if its target population is women. Social and gender norms — for example, wife inheritance, polygamy and male sexual and reproductive entitlement to wives' younger sisters — have a bearing on the effectiveness of interventions around sexual health and HIV.

Community factors such as existing social hierarchies, structures and actors with which CTC providers have to interact while going about their work, and the dexterity with which they can negotiate these interactions, have a bearing on their performance and the effectiveness of the interventions they deliver. For example, actors such as TBAs, traditional healers, elders or 'matrons' mediate CTC providers' interactions with their target populations; thus the performance of CTC providers and the effectiveness of the interventions they deliver are contingent on the accommodation of these actors and the social structures they occupy.

Established community characteristics and processes such as taboos, stigmas, beliefs and thought systems and emergent community processes such as rumours and power-plays also have a bearing on the performance of CTC providers and the effectiveness of interventions they deliver; these processes determine and shape the degree of discretion that CTC providers have and the level of initiative they can exercise.

4.3.2 Political context

The following policy factors were found to possibly influence the performance of CTC providers and/or the effectiveness of CTC interventions.

General CHW policy

In different studies, authors mention the existence of a national CHW programme — for example, in Pakistan [122, 128], Mali [88], Afghanistan [87] and South Africa [105]. In South Africa, CHWs are involved in national programmes, but they are not employed by the government. In this case, the authors raised the issue of sustainability, as community-based workers in South Africa play a major

role in national programmes on HIV and TB. They are trained to provide different preventive and curative health tasks. They are thus part of broad cross-sector response to HIV, but they lack a formal position [105].

Human resource policies

General human resource policies define the range in which programmes and interventions can operate regarding incentives, working conditions and career perspectives. The literature review found that in general the rights of CTC providers are not formally covered. There is a lack of basic entitlements such as leave and complaints mechanisms for CHWs [105]. Also, policies addressing remuneration and incentives are often absent [97], or there is a fragmentation in salaries between different CHWs [129].

Different authors highlight the need for career perspectives and opportunities for the development of CTC providers, and express the need for policies addressing these issues. Ethiopia [97, 114] and Mozambique [97] were reported to have no clear professional development programme. Also, in Uganda peer counsellors did not have a regulatory framework, and, as a result, career opportunities were not formally in place. The peer counsellors were not officially recognized by the Ministry of Health [125].

One study reported about active policy development regarding CTC providers. Daniels et al. (2012) reported that in South Africa LHW policy development was an active process, with many actors and strong debates focusing primarily on resolving issues of LHWs' working conditions (but focusing less on other issues such as gender) [130].

Legal issues

Some examples from the literature report about legal issues, especially on policies about what CTC providers may and may not do. The work of CHWs in Bangladesh, for instance, was facilitated by the fact that they were allowed to prescribe medication [82]. In Zambia the policy on counselling and testing services changed so that lay counsellors could test clients [131], and Nepal was reported to change the policy to make it possible for CHWs to prescribe antibiotics [132]. Nigeria became the first country in the world to approve national guidelines for the prevention and treatment of PPH and allowed community-based distribution of misoprostol [81], whereas in Senegal it was not allowed to administer misoprostol without supervision [133]. In Honduras service delivery guidelines restricted nurse auxiliaries from executing certain tasks, such as inserting and removing intrauterine devices [134]. In Uganda, Dambisya et al. (2012) reported that a legal framework facilitated task shifting, which made it possible for PLWHA to be involved in programmes as CTC providers. The authors reported that even without a clear legal framework, task shifting was possible when there were clear guidelines; they, however, added that the lack of legal protection is also a barrier to the effectiveness of CHW interventions [135].

Guidelines regarding CHWs in Kenya were based on WHO IMCI guidelines [136, 137]. Schneider et al. (2008) state that service delivery guidelines should address the most important subjects in the work of CHWs, without fixing a single identity and, thus, leaving enough space for provincial or local flexibility [105].

Political commitment

Sometimes, general political decisions and political commitment are not necessarily related to CTC providers but can influence the tasks that they are supposed to conduct or their work environment.

For example, Vernon et al. (2009) report that discussions on the appropriateness of the delivery of family planning services by the Ministry of Health have been a frequent feature of Guatemalan elections and subject to changes by incoming presidential administrations since the late 1970s. This had an influence on the tasks of CTC providers regarding family planning [134]. In India the deterioration of drug distribution centres was reported to have been influenced by local politics in selecting the Village Health Groups [138].

Level of decision-making and implementation capacity at those levels

In Lao PDR, responsibility for public programmes was shifted from the central level to provincial and district levels. Although this shift did, in principle, recognize the value of community engagement and locally designed interventions, low capacity at these levels meant that programmes were often poorly managed, non-consultative and non-evidence based, and activities were regularly carried out in an ad hoc fashion. There was also a large dependence on donor funding and expatriate expertise. These problems as a result of a shift in responsibility could affect the performance of CTC providers [111].

Summary

Evidence shows that political commitment and backing for implementation are key factors for the effectiveness of large scale CTC interventions. Policy choices related to consistency between roles and absorption of capacities of those mandated with oversight and implementation of CTC services, particularly in the context of decentralised political systems, has a bearing on how well CTC interventions are implemented at the local level. Coherence or the lack thereof with other policies, particularly those concerned with the legality of certain cadres providing certain services, also determines the effectiveness of CTC interventions. The extent to which CTC interventions meet these conditions has a bearing on the performance of CTC providers.

4.3.3 Other contextual factors

From the literature reviewed, the following other broad contextual factors were found to have a bearing on the performance of CTC providers and/or the effectiveness of CTC interventions.

Poverty/economic challenges

The economic context and its influence on the performance of CTC providers was highlighted in a number of studies [79, 84, 97, 101, 103, 120, 139]; it relates mainly to livelihoods, willingness to volunteer and to compensation for services rendered. Studies also report that the lack of financial or material compensation for services rendered leads to CTC providers being unable to provide for their family. This is particularly exacerbated if there is an economic crisis in the area [97]. In a study from Tanzania, facility managers reported that poverty can influence CTC providers' performance. CTC providers may reduce their work to earn an income from other sources if there is a sudden need for money [103]. A study involving CHWs from Kenya reported the need for an income as a reason for CHWs to drop out. Husbands wanted their wives to 'stop wasting time'. If other remunerated work

was available elsewhere, or if there were perceived better benefits from other NGOs, this could lead to dropping out as a CHW [84]. In summary, poverty or economic challenges facing a CTC provider's household could influence their performance and retention.

The willingness to become a CHW is also influenced by the wish to earn an income or with the hope of being compensated eventually, particularly in situations where there is high unemployment or few opportunities [101, 120]. For example, in a study on community-based drug distributors in Uganda it was reported that due to a high level of unemployment, people volunteer with the hope that they will be remunerated eventually [120]. Care facilitators for HIV in Zimbabwe who were women were more likely to be dependent on the remuneration they received from their voluntary work than men, who had other sources of income most of the time [101].

Poverty of the community — the clients of CTC providers — could also influence the work of CTC providers. Maes et al. (2013) report that food crisis not only affects CTC providers but also leads to a lack of food among clients, and this causes distress to CHWs (because they see their clients suffering) [97]. Poverty could also prevent people from seeking health services, and this has an effect on the performance of CTC services [79].

Geographical factors

Literature reveals that poor infrastructure due to geographical factors, leading to poor transportation and communication, can influence the performance of CTC providers. Expectedly, this can also influence their clients' health-seeking behaviour and can thus have a bearing on the effectiveness of CTC interventions at large [79, 99, 114, 123].

Conflict (security)

Conflict and the security situation could influence CTC providers' performance, although it is not reported in many papers. Teela et al. (2009) reported that security concerns (because of an active conflict) could have a substantial impact on the service provision of maternal health workers in Myanmar. The authors reported that the flexible nature of the multi-tiered provider network was able to partially overcome security constraints and maintain coverage of some services [99].

Disease prevalence

Maes et al. (2013) reported that the HIV epidemic itself created the necessity for CHWs; therefore, lots of people became CHWs [97]. The direct influence of disease prevalence on the performance of CTC providers is an untouched subject in the literature.

Summary

Evidence shows that most CTC providers come from modest social and economic backgrounds and that the choice of the occupation is often a result of a lack of other, better possibilities. According to the literature, this translates into two major considerations:

- their commitment to their occupation (and not necessarily their routine work) remains tentative, and is always subject to competitive pressures from other, monetarily more rewarding alternatives; and
- their expectations from the work are expectedly geared towards monetary compensation and formalization of their employment status.

The extent to which CTC interventions are able to manage these two considerations has a bearing on the performance of CTC providers, particularly LHWs. In addition, the poor economic situation and suffering of the target population, and the accompanying helplessness, can be a source of distress to CTC providers and can affect their performance. Poor infrastructure due to geographical factors, specifically poor connectivity and inadequate transportation and communication, hinders CTC providers' performance. The same factors also hinder beneficiaries from making the most of the services provided by CTC providers, and thus affect the effectiveness of CTC interventions. The extent to which CTC interventions recognize these constraints and put in place measures to overcome them has a bearing on the performance of CTC providers. There is also some evidence to show that the security situation in which CTC providers work has a bearing on their performance.

4.4 Health system factors

The following health system factors that have a bearing on the performance of CTC providers and/or the effectiveness of CTC interventions were found in the assessed literature.

Presence of functioning services, infrastructure and supply systems

Studies show that the presence of well-functioning health services and infrastructure is essential for CTC providers to be effective, as are logistics support, equipment and supplies [80, 87, 114, 117, 121, 140-142]. The literature reveals that an operational system for drug supply [92, 107, 112, 119, 133, 143-145] and other physical resources such as equipment [112, 124, 146, 147] are particularly important for the CTC services to be effective. Similarly, adequate facility capacities are needed, in terms of working conditions, quality and sufficient staffing [79, 108, 146]. Where services exist, but are not functioning well, the CTC providers are unlikely to be effective [114]; and insufficient supplies can harm CTC providers' reputation [92] and affect their performance.

Related to the above is the need for back-up support from the formal/professional health staff. Literature shows this as being critical to the CTC providers to stay motivated and to be able to perform well. This support needs to be wide-ranging, continuous and timely [79, 98, 109, 112, 119, 125, 148-151]. Dambisya et al. (2012) [135] and Satti et al. (2012) [152] highlight the importance of the ability of the health services to offer a continuum of services in which the services delivered by CTC providers are embedded. Wools-Kaloustian et al. (2009) [127] and Smith et al. (2013) [153] highlight the importance of a functioning and bidirectional referral and feedback loop. The absence of support from formal health staff — for example, due to high professional staff turnover [150], lack of trust by health professional staff [79] and overall lack of such support [98] — can affect the motivation and performance of CTC providers.

Ahmed et al. (2008) report that a health system context where general access to formal health services is poor or weak is a context in which CTC services are more likely to be successful [154]. This is in many ways expected, as beneficiary communities have no other alternative.

Presence of an operational referral system

A number of authors report on CTC providers' need to be able to rely on an operational and robust referral system [114, 119, 121, 124, 126, 147, 150, 155, 156]. Others point out that the lack of

adequate follow-up in terms of treatment [150] and delays in communication [124] contribute to CTC providers' dissatisfaction and undermine their performance.

Clarity of roles and operating procedures

Studies show that for CTC providers to be effective, they should have clear operating procedures and guidelines [135, 157], including clearly defined and demarcated roles and relationships with other cadres and actors [114]. Peltzer et al. (2010) indicate that to be effective, CTC providers should have a finite and well-defined role and function [158].

Health system's ability to accommodate CTC providers' expectations

Studies show that CTC providers' performance is influenced by the health system's ability to accommodate their expectations — particularly around formalization of their status [102], prospects for career development and progress [152] and incentives.

The literature consistently reveals that CTC providers find monetary and material incentives important [88, 90, 94, 96, 97, 102, 106-108, 114, 119, 152, 159, 160], whether on a regular basis [149], more incidentally [94] or performance-based — for example, per delivery or drug sale [90]. The prospect of working towards a permanent job is for many an important incentive as well, while in some settings CTC providers indeed have become another formal cadre [88, 96, 119]. Peltzer et al. (2010) report that CTC providers, particularly those who volunteer (e.g. CHWs, lay counsellors), are unlikely to continue to serve without salaries — particularly if the expectations from them are broadened [158]. The literature is not conclusive about when such a threshold is likely to be achieved, and in any case this is likely to vary from context to context.

Studies also show that if these elements are not addressed, CTC providers' performance suffers [114]. For example, Nsabgasani et al. (2007) report that lack of incentives, particularly monetary and material incentives, hinders CTC providers' performance [120]. In the same vein, unkept promises regarding future incentives may dissatisfy CTC providers (although not necessarily lead to attrition) [97], while parallel programmes offering incentives when one's own does not can be discouraging [107]. It follows that there is a need for strong coordination and robust stewardship in settings where different actors use the services of CTC providers. More detail on financial and also non-financial incentives is given in Section 4.5.1.

Presence of a supervision and monitoring system

A key factor highlighted by many authors is the importance of a functional supervision system whereby providers from the formal health staff (and sometimes others such as project staff) motivate, give feedback and guide CTC providers [90-92, 94, 96, 112, 118, 119, 125, 126, 129, 133, 141, 143-146, 150, 161, 162]. This included the importance of timeliness of such feedback and support (77, 91). In the same vein, Omer et al. (2008) [163] and Viswanathan et al. (2012) [80] report the importance of tracking and monitoring the work done by CTC providers. They state that, to meet beneficiaries' expectations and to ensure accountability, it is important that CTC providers' work be tracked and monitored closely. Nsabagasani et al. (2007) observe that a lack of supportive supervision impedes CTC providers' performance [120]. The existence of supervision and monitoring systems within the general health system could be an important pre-condition for the implementation of supervision and monitoring systems at the intervention level, directly influencing

CTC providers' performance. Intervention-level monitoring and supervision is described in the section on intervention design factors (Section 4.5).

Explicit buy-in of various state agencies

Omer et al. (2008) [163] and Ye-ebiyo et al. (2007) [115] report that for CTC services to be effective, explicit buy-in into the services by the government and clear intergovernmental agency agreement and coordination (on matters such as training, expectations) is important. Ye-ebiyo et al. (2007) point out that unless this is the case, the performance of CTC services will likely be compromised [115]. Callaghan-Koru et al. (2012) present an example of disagreement at national level in Malawi about CTC services, when in 2009, the Medical Council considered the community case management programme illegal because it had objections to HSAs performing clinical services [92]. Regarding a CHW programme in Iran, Behdjad et al. (2009) reported that leadership and continuous support of the formal health system was central to the success of the intervention [148].

Summary

The literature review identified a number of health system factors that influence CTC providers' performance, which we divided into the presence of functioning services, infrastructure and supply systems; the presence of an operational referral system; clarity on roles of CTC providers and their operating procedures; the health system's ability to accommodate CTC providers' expectations; the presence of a monitoring and supervision system; and an explicit buy-in (or the absence of buy-in) from various state agencies.

4.5 Intervention design factors

The literature revealed that various aspects related to the design of the CTC intervention had a major effect on the performance of CTC providers. We first discuss factors relating to our three focus areas: human resource management, programme quality and M&E. Then we discuss other intervention design factors found in the literature.

4.5.1 Human resource management

The literature review identifies two main human resource management issues that could influence CTC providers' performance: incentives and supervision. Performance appraisal was mentioned in fewer studies. All will be addressed in turn below.

Remuneration and incentives

The literature consistently reveals that across all CTC provider types and contexts, some form of remuneration and/or incentive is expected by service providers and offered by either the organizations with which they work or the communities and clients to which they provide services. The prospect of working towards a permanent job is for many an important incentive as well, while in some settings CTC providers indeed have become another formal cadre [88, 96, 119]. In fact Peltzer et al. (2010) (81) report that CTC providers, particularly those who volunteer (e.g. CHWs, lay counsellors) are unlikely to continue to serve without salaries — particularly if the expectations related to their tasks are broadened [158]. The literature is not conclusive about when such a threshold is likely to be achieved, and in any case this is likely to vary from context to context.

Types of incentives

The review identified a range of forms of remuneration and incentives, from more regular to incidental and from monetary via material (non-monetary) to immaterial incentives. See Annex 5 for an overview of the different types of incentives found in the literature.

In some countries, CTC providers receive a fixed salary from the government or from an NGO. Most CTC providers, however, are not regular employees. Still, in many cases, they receive a regular, fixed stipend or allowance in return for their efforts and/or to cover actual or potential costs they incur in the exercise of duties (transport, communication). Sometimes the monetary allowances are part of a package with other material incentives. Peer health workers in Uganda, for example, not only received an allowance of about US\$12.5 but also bicycles, t-shirts and basic supplies [164]. In other cases, salaried CTC providers can receive extra allowances. For example, in Ethiopia, HEWs receive per diems in addition to their salary — for example, for participation in polio campaigns and de-worming and for attending meetings [114]. Allowances vary greatly in amount in relation to the expected number of working hours. Other organizations paid allowance on an irregular basis, such as per diems for attending workshops or meetings or if CTC providers do additional work (e.g. CHWs in China [165]).

The literature review delivered many examples of organizations using a performance-based incentive scheme, whereby the timing and amount of incentives depend on the delivery of certain services. The case of the *Shasthya Shebikas* (Bangladesh, [166]) led to some considerations on the effect of performance-based incentive systems. They received financial compensation based on the number of referrals, pregnancy identifications, neonatal care during delivery and measuring newborn weight. In this study, it was found that almost 93% of the existing *Shasthya Shebikas* whose income had gone down felt that this happened because they covered fewer households after the introduction of the programme (when their catchment areas became smaller). Many *Shasthya Shebikas* saw themselves being ‘threatened by competition’. In comparison with existing *Shasthya Shebikas*, many more new *Shasthya Shebikas* said they faced financial difficulties due to other health commodity sellers. This may indicate that, in this context, the more active CHWs are in their communities, the more income they can generate [166].

Many organizations offered material incentives, instead of or sometimes in addition to financial rewards. In some cases, we came across examples of communities providing goods and incentives. As an alternative to the provision of monetary and other material incentives by organizations and communities, in some contexts a scheme was established that allows or motivates CTC providers to generate income by charging their clients a fee for the services they provide. Another way for CTC providers to generate their own income is by selling health-related commodities (which is also the case for *Shasthya Shebikas* in Bangladesh, [166]).

Rewards and motivational incentives for CTC providers are not only material in nature. Often, non-material incentives are part of the package and sometimes the only form of reward, expressed as job satisfaction (able to help people, observing that people are getting healthier), community recognition and associated status and also recognition by health staff and managers [150]. This may be especially important if no other forms of (material, monetary and otherwise) incentives are available or offered, as was reported by several studies [113, 125, 142, 159].

Expectations and realities regarding remuneration and incentives

Our review showed that in most contexts CTC providers expect some form of incentive and that many of the organizations with which they work also find this desirable, for a number of reasons [90, 96, 167]. Realities often deviated from these expectations, in a number of situations, contributing to dissatisfaction among CTC providers.

Several studies offered insights into the type and amount of incentives CTC providers, and other stakeholders, may expect. Financial incentives were reported as being an important factor affecting the performance of CTC providers [102, 142, 158, 168]. CTC providers appreciated the training and meeting allowances they received [92, 101, 119, 131, 167]; some studies report this as being the most important motivator of CTC providers [90, 169]. Srivastava et al. (2009) report that it might be that CTC providers' preferences for activities was influenced by the financial incentives attached [119]. On the other hand, Kallaghan-Koru et al. (2012) report that having to spend their own money was a demotivator for CTC providers [92]. When the intervention design lacked any incentives for CTC providers (as they perceived it), it undermined their performance [96, 97, 100, 169].

In Uganda, community-based volunteer malaria drug distributors and caregivers reported that a lack of diagnostic equipment, lighting to facilitate work at night, gumboots to protect against snake bites while making community visits, soap for hand washing before handling drugs, and storage containers to keep medicines was hindering their work. In addition, CTC providers and community leaders said the lack of payment and supervision was a great barrier to motivation [120].

In Bangladesh, most *Shasthya Shebikas* indicated that their most preferred incentive was the prospect of receiving a regular monthly salary. Next, they would expect financial incentives such as travel allowances, access to loans and cheaper medicines, while preferred non-monetary incentives mentioned were umbrellas, bags, trunks for safe storage of health products, bicycles, mobile phones and others. They also mentioned immaterial rewards, small medical equipment and productive assets such as cows and sewing machines [166].

Hoke et al. (2008) point out that when the intervention design systematically strives to raise the status of the CTC providers in the beneficiary community, their performance and the intervention's effectiveness improves [170]. In a study in Ethiopia by Amare et al. (2011) other respondents than voluntary CHWs recommended potential non-monetary incentives, including participation in rotating credit groups, exemption from compulsory public work and community support for the CHWs' agricultural tasks. Also mentioned were materials such as stationery and boots, plus free health care for CHWs and their families [91].

In the context of a CDI in Tanzania, the CDI implementer's community members discussed the issue of remuneration and proposed non-monetary incentives such as gifts and exemption from community duties [107].

Whether CTC providers were remunerated or not influenced performance in many ways. Not only does it directly motivate CTC providers, according to Puett et al. (2013), it also serves to their being acknowledged and respected by the beneficiary community [82].

However, not all stakeholders always feel that incentives are appropriate. A study in Zambia found that the community was appreciative about the work done by the CHW, but not in support of providing incentives, whether in cash or in kind [95].

Realities and dissatisfaction

The lack of (sufficient) incentives may easily lead to dissatisfaction. For example, community drug distributors in Ethiopia said their lack of motivation was due to the interruption of incentives such as stipends and t-shirts [100]. Lay HIV counsellors in South Africa felt they should receive higher financial compensation for their work [158]. In Kenya, female CHWs indicated that CHW drop-out could be a result of a lack of remuneration. They indicated that some husbands want their wives to 'stop wasting time' if there is no money attached [84]. In Bolivia, CHWs reported poor incentives, contributing to general dissatisfaction [109]. Discouragement and demotivation may also be generated by unkept promises regarding future incentives (for example, CHWs in Mozambique [97] and community-based volunteers in Ghana [171]) and by other programmes offering incentives while one's own does not [107]. In India, volunteer drug distributors' performance deteriorated because of irregular and low remuneration [138].

Furthermore, community-based volunteer malaria drug distributors in Uganda, as well as family caregivers, were concerned about the lack of remuneration and recognition by local government authorities for the work performed [120]. Some Ugandan CHWs perceived a lack of sufficient transport allowances to collect drugs. A lack of materials to allow work at night was mentioned among issues limiting performance [112].

In Gambia there is no standard compensation to reward the services of TBAs. Village development committees are expected to encourage community members to offer TBAs their support — for example, by cultivating, sowing and harvesting their land. However, many TBAs complained that this labour was not forthcoming [104].

As with other cadres, also when CTC providers are full-time employed and remunerated, they have certain expectations and may report dissatisfaction with wages and benefits, such as the case of *Behvarz* (CHWs) in Iran, who were also dissatisfied more generally [148, 172].

Financial incentives: necessary or not?

Mukherjee et al. (2007) acknowledge that payment of lay CHWs is often criticized as unsustainable by programmes which have relied on volunteers to perform community work [173]. The authors justify paying CHWs (HIV and TB programmes in Haiti: US\$500 per year) for the reason of community empowerment (as the stipends represent paying people for meaningful and respected work, this provides a needed income in a very impoverished area, and recruiting and retaining CHWs as part of the professional medical team serves to elevate the importance of this role in the health structure) and cost savings associated with the delay of resistance to first-line antiretroviral drugs [173].

Taking a different perspective, Scott et al. (2010) state that outcome-based payments (based on actual services provided) limits performance in other areas (e.g. broader community development) [108]. Some CTC providers did not want to be paid and supported the spirit of volunteering [78].

Supervision

A key factor affecting CTC providers' performance highlighted by many authors is a working supervision system, whereby providers from the formal health staff (and sometimes others such as project staff) motivate, give feedback and guide CTC providers [82, 83, 90, 92, 94, 96, 101, 112, 119, 125, 126, 133, 143-146, 150, 162, 174, 175]. The review identified a number of aspects relevant for supervision: whether the current CTC provider set-up involves any form of supervision; who assumes the role of supervisor; whether there is community involvement in supervision; the frequency of supervision; the focus (contents) of supervision; the place of the supervision; the role of mhealth; and the relationship between CTC providers and their supervisors.

Supervisory process built into the intervention design

Many of the reviewed studies across varied contexts indicated that some form of supervision was part of the CTC provider set-up design (HSAs in Malawi [92]; CHWs in Bangladesh [79]; lay counsellors in Zambia [131]; CDI implementers in Tanzania [107]; female community health volunteers in Nepal [85]; (trained) storekeepers in Malawi [150]; frontline health workers in South Sudan [146]; adherence support workers in Zambia [176]; auxiliary midwives in Senegal [133]; TBAs in Malawi [143]; Village Malaria Workers (VMWs) in Cambodia [177]; CHWs in Uganda [112] and *Shasthya Shebikas* in Bangladesh [90]). However, many studies are lacking information on the precise structure and implementation of supervision.

Role of supervisor

Supervision of (partly) facility-based CTC providers is usually carried out by professional health staff based in the same facility. In Malawi, HSAs are supervised by the environmental health officers or senior HSAs [140, 178], and expert patients by the facility nurse [160]. In Uganda, community antiretroviral therapy and TB treatment supporters who are expert patients (PLWHA) were supervised weekly by their team leaders; they were part of monthly staff meetings to feedback on community activities [129]. Lay mental health workers in Zimbabwe were supervised by the facility nurse, psychologist and psychiatrist [93]. Ethiopian HEWs received supervision from the *Wodera* health office staff [114].

In most of the cases, however, CTC providers are not facility-based, and the role of the supervisor varies according to context and the type of provider. In Malawi, PMTCT CHWs received supervision from field supervisors and programme staff [83]; while regular evaluation of knowledge and practices of TBAs was done through a questionnaire administered by a senior nurse during supervision visits, four or five times a year [143]. Lay HIV counsellors in South Africa were supervised by psychologists and social workers contracted by the NGO [179]. In Ethiopia, volunteer CHWs were supervised by other CTC providers, i.e. HEWs [91], while community drug distributors (for Onchocerciasis) received supervision from HEWs and nurses [100]. In a study on peer/expert patients conducting HIV in the community in Kenya, supervision was done by a clinical officer [127]. Community volunteers (for growth monitoring) in DRC were supervised by a health centre senior nurse and a village nutrition committee, which was actively involved in the intervention [161]. Community-Based Distributors of contraceptives in Madagascar were supervised by both the clinician at the local health centre and the NGO-supported technical adviser; the latter primarily supervised the proper completion of forms and helped with various logistical issues, while clinicians were the primary technical supervisors, assuring the quality of service provision [170]. Auxiliary

midwives in Senegal were supervised by midwives or Community Health Agents [133]. VMWs in Cambodia received a visit by facility staff [177], just like CHWs in Uganda [112]. In Tanzania, peer educators' supervision was expected to be conducted by district health authorities, health workers from nearby health facilities and village leaders [167].

In some studies, supervision was addressed in the context of a pilot intervention or research project [93, 158, 180], without the direct involvement of professional health staff in supervision. Supervision was sometimes done by research staff and NGO staff together [181].

In summary, the studies showed a variety of people involved in supervision, but there was no reference to a possible influence of who supervises on the performance of CTC providers. One study in rural health centres in Zambia referred to the training of supervisors. Training was done to show staff how to supervise CHWs and how to conduct performance assessments [141]. Few sources addressed the number of supervisees overseen by one supervisor. Among those that did, numbers varied from 10 [182] to 25–40 [82] and 50 [183].

Community involvement in supervision

In a number of settings, communities are actively involved in the set-up and activities of CTC providers. One potential aspect of this is the role of communities (leaders, clients) in supervision, as was reported by several studies. Community anchor organizations had a role in monitoring the performance of voluntary CHWs in Ethiopia, who were also selected by the community [91]. Female community members were involved in supervising CHWs working in family planning in Afghanistan [184]. In Indonesia, performance-based incentives for community facilitators were partly based on inputs from the pregnant women, their clients [185]. For Malaria Control Assistants in Sudan, who were selected by the community, active Village Health Committees (VHCs) supported, facilitated and supervised their Malaria Control Assistant [117]. In Madagascar, Social Development Committees comprised of community leaders supervised the Community Health Volunteers (CHVs) from the community's standpoint [153]. In these studies, the support and supervision from the community was reported as one of the programme's success factors.

Frequency of supervision

While most settings that operate with a supervision system work on the basis of regular meetings (VMWs in Cambodia [177]; CHWs in Uganda [112]), studies report a great variety in the frequency of supervision, from weekly to monthly and less.

Weekly: Several studies reported weekly supervision efforts. In a programme of the National AIDS Research Institute in India, peer educators had weekly meetings together with staff from the research institute [181]. Indian ASHAs were expected to attend weekly meetings at the local primary health care clinic with the ANM who manages them [108]. In another study, on lay workers or 'grandmother health providers' working in the field of mental health in Zimbabwe, there was weekly one-hour group supervision by a nurse trained in counselling. In addition, every two weeks, a clinical psychologist attended the meeting, and once a month a psychiatrist [93]. In Ghana, Community-Based Surveillance Volunteers (CBSVs) were supervised by health centre staff (nurses or zonal coordinators). Most CBSVs referred to a strong level of guidance they received from supervisors. Over half reported that they see their supervisors on a weekly basis [94]. Community antiretroviral

therapy and TB treatment supporters in Uganda were also supervised on a weekly basis [129]. For Zimbabwean HIV care facilitators, there was one supervisor and one counsellor at each project site. Supervisors and counsellors were always ready to accept home visit reports and address problems that the care facilitators faced during working days. They also had a meeting each week to share their experiences [101].

Monthly: Monthly supervision was reported for HSAs in Malawi [140], lay HIV counsellors in South Africa [179], volunteer CHWs working in maternal, neonatal and child health in Uganda [118], volunteer CHWs in Ethiopia [91], community volunteers in DRC [161], CHWs in Bolivia [109], CHWs in Bangladesh [174, 182], breastfeeding counsellors in South Africa [186], VMWs in Cambodia [177], CHWs in Uganda [112], community voluntary workers in Uganda [187] and female community health volunteers in Nepal [85]. Monthly supervision was also carried out by research staff in Nigeria to check entries in CMDs' records [188]. South African lay health workers were visited by trainers on a monthly basis on farms to provide supervision and support for their activities [189]. In Uganda, monthly supervision took place by health workers, who checked the treatment practices of CHWs, drug storage and record keeping [112]. In Zambia, monthly supervisory visits of CHWs were done by health workers [147, 190] and were reported to also include performance appraisal. These monthly visits worked both for CHWs and for health centre staff [147]. Burkina women's group leaders met health workers monthly in the sub-villages for supervision with a standardized checklist, collection of forms and for drug provision. Overall supervision — and, if necessary, specific support — was carried out by the investigators of the research project every month for the first three months and thereafter every three months [67]. Community Health Volunteers (CHVs) in Madagascar were supervised monthly by a meeting of the Social Development Committee, at which community leaders were present. They were also supposed to receive regular site visits from their supervisors from the health facility, but it was found that receiving fewer than six supervision visits in the past 12 months was associated with lower performance scores (β -0.08) of community IMCI CHVs [153].

Weekly-monthly combination: PMTCT CHWs in Malawi were supervised weekly by a site supervisor and monthly by programme staff [83]. For expert patients in Malawi, supervision was on the job at the health facility, and they were involved in bi-weekly quality meetings at facility level [160].

Decrease in supervision over time: In Bangladesh, CHWs received more supervision at the beginning of their job, but after two or three months the amount of supervision decreased [82]. The same was reported for Malaria Control Assistants in Sudan. They received monthly supervision, but after three months the frequency of the supervision decreased [117].

Other: In Ethiopia, half of HEWs supervised by *Wodera* health office staff received three or more supervision visits in about nine months [114]. VMWs in Cambodia received a visit by facility staff twice yearly [177], just like CHWs in Uganda [112].

In summary, the studies showed a variety in frequency of supervision, but there was only one reference to a lower frequency of supervision resulting in lower performance of CTC providers.

Nature of the supervision

Our literature review reveals that the focus and nature of supervision varies from administrative issues (administration, record keeping) to problem solving (programme contents) or a combination of both.

Administrative-oriented supervision: A few studies indicated that supervision mainly focused on administrative issues. For maternal health workers in Lesotho, the focus of supervision by facility-based nurse-midwives was to verify records [152]. In DRC, supervision of community volunteers was to validate reporting and send the reports to a higher level [161]. Research staff in Nigeria focused on checking records filled in by CMDs [188].

Problem-solving-oriented supervision (content): Far more studies, however, showed supervisors' interest in content issues and solving problems. Lay mental health workers in Zimbabwe discussed problems and cases during their supervision meetings [93]. Also, for Malaria Control Assistants in Sudan these sessions included clinical cases and discussing problems [117]. South African lay health workers were visited by trainers on a monthly basis on farms to provide supervision and support for their activities [189]. Breastfeeding counsellors in South Africa were supervised by breastfeeding supervisors who carried out monthly home visits with each counsellor to monitor the quality of counselling, and they also conducted problem-solving visits [186]. Volunteer CHWs in Uganda working in maternal, neonatal and child health attended monthly review meetings to review village reports and for two hours of refresher training (in a combined approach for supervision and continuous education) [118]. In Bangladesh, CHWs who were trained to implement a new algorithm to diagnose newborn illnesses had supervisors who spent two days a month accompanying each CHW, evaluated their performance by using a structured checklist and provided immediate feedback [174, 182]. *Shasthya Shebikas* in Bangladesh from a particular area were all brought once a month to the BRAC field office for a day-long refresher training course conducted by the programme organizer health. These programme organizers were also responsible for all health programme activities occurring in the catchment areas of the field office and supervision of the *Shasthya Shebikas* and the *Shasthya Kormis*. The *Shasthya Kormis* (supervisors of the *Shasthya Shebikas*) and the health programme organizer worked under the overall supervision of a medical doctor in an area. During the sessions, problems faced during service provision by the *Shasthya Shebikas* as well as those observed by the *Shasthya Kormis* during field visits were discussed, along with probable solutions [168].

Combination supervision — administrative and contents: In a number of cases, supervision was comprehensive in the sense of combining both administrative and content issues. Peer educators in India were supervised by paid NGO staff who looked after administrative issues (maintaining patient records, providing honoraria). But they also had weekly meetings with staff from the National AIDS Research Institute, to understand and solve problems faced by peer educators and NGOs or community-based organizations in the community. They also served as administrative meetings where all peers provided weekly planning and submitted their weekly reports [181]. Community-Based Distributors of contraceptives in Madagascar were supervised both by clinicians, who were the primary technical supervisors, assuring quality of service provision at the local health centre, and by the NGO-supported technical assistant, who primarily supervised the proper completion of forms and helped with various logistical issues [170]. Among CHWs in Bangladesh, at the beginning of a

new intervention, supervision is designed to be more on content and after a while focuses more on administrative issues and record keeping [82].

In summary, the studies showed supervision of different nature, but there was no reference to a possible influence of the nature of supervision on the performance of CTC providers (although it is well accepted that content and problem-solving supervision is more desirable).

Location of supervision

Chanda et al. (2011) reported that in rural Zambia supervision in the health centre was not appreciated by CHWs, as they felt they missed out on providing care to their own village [190].

mHealth

New communication technologies also change the landscape of supervision. In South Africa, telephone support was provided in addition to face-to-face supportive supervision meetings, to provide additional technical assistance to lay counsellors [191]. In Uganda, peer health workers received a mobile phone; health staff that received text messages from peer health workers could then provide instructions, send a higher-level care provider or arrange transport for referral [164]. In the same country, community volunteer workers were in touch with their supervisors via mobile phone for day-to-day support and advice [187].

Relationship between supervisors and supervisees

In Gambia, TBA study participants reported good relationships with their professional supervisors and vice versa: all supervising Community Health Nurses confirmed that their relationships with the TBAs they supervised were characterized by mutual respect, even during those times when there was a difference of opinion or when mistakes were made [104].

Expectations and realities regarding supervision

A number of sources emphasized the importance of adequate supervision, both in terms of quality as well as quantity (frequency), from the perspectives of both organizations and CTC providers. Realities often deviate from these plans and expectations.

In India, ASHAs expressed the need for on-the-job support, as this would provide individual attention and support [119]. Professional health workers in Pakistan thought support workers were important and indicated that good supervision was necessary [128]. In Ghana the need for good-quality supervision of CBSVs was identified to increase retention, even if there was no remuneration [171]. Supervision and links with the formal health system lent credibility and recognition to CTC providers (Community Reproductive Health Workers) in Uganda [126]. Kenyan CHWs benefited from supervision from project staff who trained Community Health Extension Workers (CHEWs) and CHW leaders to undertake field supervision. This was an important component that ensured CHWs were doing their work well and gave them the support they needed. It was not clear whether and how this supervision would continue after the end of the grant period. The District Health Management Team and CHEWs indicated it would continue, but in reality CHEWs have a number of other responsibilities, and after the project other activities may take priority again [192].

Irregular, absent or low-quality supervision was often identified, as were their implications for CTC providers' performance. In Honduras, two-monthly supervisory visits were planned to support auxiliary nurses, but this never happened because of financial and logistical constraints [134]. In CTC provider settings in Malawi [140], Ethiopia [125], Uganda [125, 126, 193], Mozambique [121], Mali [88, 142], Iran [96], India [144] and Pakistan [128] supervision was found to be weak and, therefore, CTC providers' performance was hampered. In India, drug distribution centre volunteers' functioning became weaker due to a lack of proper supervision, resulting in non-functioning centres [138]. In Uganda, facility staff members were responsible for supervisory support to CTC providers (peer counsellors). However, in facilities that did not have a peer counsellor coordinator, staff mentioned inadequate supervision and support due to the overall lack of professional staff. In Ethiopia, good guidelines for team supervision were in place; however, according to providers as well as peer counsellors, staff were neither sufficient nor trained to provide good supervision [125]. For another CTC provider cadre in Uganda, the community-based volunteer malaria drug distributor, it was reported that the workload at the health centres hampered health staff from interacting with and supervising the drug distributors in the community [120]. This was mentioned by drug distributors and community leaders, who identified the weak supervision as a great barrier to motivation [120]. From a different angle, some CTC providers as well as non-CTC health workers evaluated supervision not as supportive but 'negative' in nature, as in Tanzania [103].

Performance appraisal

A topic related to supervision is performance appraisal; very few studies reported on performance appraisal systems for CTC providers. In Indonesia, supervision of community facilitators was linked to performance appraisal and incentives; certificates and monetary incentives depended on the supervision (besides test outcomes) [185]. A study in Zambia on CHWs used the CHW Assessment and Improvement Matrix tool [194] for performance appraisal [95]. With this tool, the performance of CHWs could be measured (using number of hours spent on training, on tasks, incentives and a 16-point engagement questionnaire). Also in Zambia, monthly supervisory visits were reported to also include performance appraisal [147]. Health workers (CTC and non-CTC) in Tanzania reported that performance appraisal was lacking feedback and was not confidential [103]. An assessment of the CHV programme in Madagascar found that a system of performance appraisal was in place. Competencies were evaluated on a quarterly basis, according to a scoring system, allowing the supervisor to monitor each CHV's knowledge and skills over time [153].

Summary

The literature consistently shows that CTC providers find monetary and material incentives important, whether on a regular basis, incidentally or performance-based. Those who volunteer are unlikely to continue without monetary or material incentives. The literature is not conclusive about when such a threshold is likely to be achieved, and in any case this is likely to vary from context to context. The prospect of working towards a permanent job is for many an important incentive, and in some contexts CHWs have become salaried cadres formally embedded in the health systems. Others are paid by organizations, and most are not formal employees.

Incentives are in many cases a combination of monetary and material support — for example, a stipend and bicycle, and occasional benefits such as per diems for training. Performance-based incentives may be organized as payment for reaching targets such as the number of clients referred,

treated etc. This may lead to prioritizing paid-for activities and reduce input in others, or may lead to dissatisfaction with the catchment area allocated, which influences the number of clients that can be reached. Another form of monetary incentive is the selling of services or commodities such as contraceptives. Great differences exist between and sometimes within countries in the remuneration CHWs receive in relation to the hours of work they deliver. Feelings of inequity among CHWs in relation to not only other CHWs and health providers but also in relation to the perceived luxury of offices and salaries of programme staff occur and affect job satisfaction and, ultimately, performance.

Non-monetary incentives are important for those volunteers who do not receive other incentives, as well as those who do. Typical examples of factors that motivate CTC providers to become and stay on as a volunteer are expressed as job satisfaction, community recognition and associated status, and also recognition by health staff and managers. The way community recognition and status is experienced and expressed varies from feeling proud to be chosen, feeling good to be helping people, being treated with respect and obtaining an elevated status in the community to being publically accredited.

CTC providers expect some form of incentive, and many of the organizations with which they work also find this desirable, for various reasons. Monetary rewards are not necessarily the most important factor influencing performance. However, disruption of rewards, not meeting expectations and difficulties providing for families may lead to dissatisfaction.

A key factor affecting CTC providers' performance highlighted by a number of authors is a working supervision system, whereby providers from the formal health staff (and sometimes others such as project or research staff) monitor, guide, give feedback to and motivate CTC providers. Across various studies, the importance of adequate supervision (both in terms of quality as well as quantity (frequency)) was emphasized by both the host organizations and CTC providers themselves.

Many of the reviewed studies across varied geographical and other contexts indicated that some form of supervision was part of the CTC provider set-up design. Supervision of facility-based CTC providers is carried out by professional health staff based in the same facility. However, many CTC providers are not facility-based, and the role of supervisor varies according to context and the type of CTC provider and host organization. In addition to the 'formal' supervisor, in a number of settings community members were actively involved in supervision. Some studies reported the support and supervision of the community as one of the success factors of the CTC intervention programme.

Studies report a great variety in the frequency of supervision, from weekly to monthly and less; often individually but sometimes (also) involving group supervision. Our literature review reveals, furthermore, that the focus and nature of supervision varies from administrative issues (administration, record keeping) to problem solving (programme contents) or a combination of both. However, realities often deviate from plans and expectations, and supervision does not always take place as regularly as planned, due to human resource, workload, logistical (transport) and budget constraints.

4.5.2 Programme quality

The following processes related to quality assurance (QA) that could influence the performance of CTC providers and/or the effectiveness of CTC interventions were identified from the literature.

Intensive initial trainings

Many studies report intensive and focused initial training as being important. The duration of this training varies by subject, scope of work and type of CTC provider. The duration of such initial training in the reviewed studies varied from three days [82, 113, 158] to one year (HEWs in Ethiopia).

Huicho et al. (2008) observe that those CTC providers who receive shorter, focused training are more likely to be open to adhering to and following guidelines, while pointing out that those with longer training are less likely to — although the latter do not necessarily give incorrect treatment [195]. Perez et al. (2009) report that the CTC providers in their study (CHWs in Mali) found the five-day training to be too short [142].

Regular refresher trainings

Many studies report the need for and importance of regular refresher training, but no before-and-after studies were found that investigated the influence of refresher training on the performance of CTC providers. Frequency ranges from monthly [82, 102, 118, 152] to quarterly [83, 86] refreshers. Others mention the need for refreshers but do not specify the frequency [109, 136, 168, 174, 179]. Others add that regular (weekly [129]; halfway through the intervention period [174]) reiteration by supervisors of the key messages from the initial training was important to ensure CTC providers' effectiveness.

In the same vein, Gill et al. (2011) report the importance of training followed by skills assessment [37]; while the authors are not clear what precisely this entails, it appears to be similar to what Shankar et al. (2009) report in Indonesia, wherein community facilitators needed to undergo an assessment and recertification every month [185].

One reference was found to the effect of refresher training on performance, for CHVs in Madagascar. CHVs working in family planning who reported to have received refresher training scored 12.3% higher on performance (measured through observations and with a checklist) than CHVs that did not receive refresher training [153].

Sharing experiences: through visits and review meetings

Simon et al. (2009) report that regular review meetings to share experiences and give feedback to CTC providers were useful [123]. Similarly, Amare et al. (2011) report that CHWs find experience-sharing visits a useful way to refresh knowledge and learning [91].

Use of job aids and training on using job aids

Satti et al. (2012) [152], Lemay et al. (2012) [196] and Hamer et al. (2012) [141] point out the importance of job aids for CTC providers and the training of CTC providers in using these job aids. Dambisya et al. (2012) point out the importance of having well-defined standard operating

procedures for various tasks assigned to CHWs [135]; Teklehaimnot et al. (2007) add that to be effective these tools, aids and training should be in the local language [114].

Use of predefined and agreed checklists for regular performance monitoring

Dawson et al. (2008) [132] and Ahmed et al. (2008) [168] contend that regular monitoring of community volunteers using a standardized checklist as a QA tool can help improve the effectiveness of the CTC intervention.

Training of supervisors

According to Alamo et al. (2012) good training of supervisors who supervise CTC providers is important for the CTC services to be effective [129]. As mentioned earlier, a study on CHWs working on the treatment of illnesses and health education in Zambia reported that supervisors were trained. The study had good results regarding the competences of CTC providers [141]. The exact methods used for supervision and the training of supervisors were not found in the assessed literature.

Participatory development of training material

Omer et al. (2008) share how developing health promotion material in a participatory way with the CTC providers (LHWs) contributed to improving the effectiveness of the intervention. They discuss in detail what they call the process of ‘socialization of evidence’ [163].

Combination of theoretical and practical training

The literature consistently reveals that a combination of theoretical and practical training is required [80, 97, 118, 140, 149, 160, 174, 197, 198]. Hardly ever is training for CTC providers solely theoretical. What entails practical training, however, varies widely: problem-based learning/problem-solving activities [118]; participatory and solution-based (authors’ preferred name for the more commonly used moniker of problem-based learning [199]); adult learning [200]; and role plays [136]. The importance of training content focused on developing social, interpersonal, cultural and management competences, in addition to technical knowledge and skills, was reported as being important for CTC providers to be effective in doing their assigned work [149, 181, 201].

Some authors present, but do not necessarily discuss, the mix in terms of duration, and this also varies by cadre and scope of work of the cadre — for example, one week classroom + two months of practical learning for community care coordinators in Kenya [127]; four days classroom + two days of practical IMCI training for CHEWs in Nigeria [202].

Training of other cadres

Prytherch et al. (2012) point out that where CTC providers (in this case, auxiliaries) work with lower-level or other cadres their performance is also influenced by the level and extent of the training/performance of these other cadres [103].

Summary

QA of CTC providers’ performance has several dimensions. There are strong links to human resource management, such as supervision, that were discussed earlier. Another dimension is the availability and use of guidelines and protocols; however, the reviewed literature hardly addressed this. The literature findings mostly dealt with training and related issues. Many studies reported initial

training as being important, whereby the duration varies by subject, scope of work and CTC provider cadre (shortest three days, longest 10 weeks). As regards content, a combination of theory and (various forms of) practice is widely accepted as a requirement, although the mix of both varies and seems in need of more discussion. Different sources, furthermore, propose a range of contents to make CTC interventions effective, including technical knowledge and skills as an obvious core, but also training on socio-cultural, interpersonal and management competences and on (pre-developed) job aids. The need for (regular) refresher training and training of supervisors was also emphasized by some, as well as follow-up of training with skills assessment and monitoring of performance with QA tools. Finally, some authors report that regular experience-sharing and feedback meetings involving providers and supervisors were useful.

4.5.3 Monitoring and evaluation

Programme monitoring was mentioned in some studies as being relevant to CTC providers' performance, although no relevant details regarding how it influenced their performance were shared. Some papers reported on frequency [78, 138, 145, 147, 188, 203, 204], showing an expected range including some very frequent monitoring, particularly in research settings (e.g. daily monitoring [204]).

Community monitoring — for example, in the form of monitoring by village health committee [161], other community stakeholders [150] and women's groups [67] — was also reported. Again, none explicitly reported the effect of such processes on the performance of CTC providers. For more findings on community monitoring, see Section 4.3.1. Others report the use of specially developed pictorial monitoring tools to facilitate monitoring; these were used when CTC providers were illiterate or semi-literate [67, 85, 94, 143, 205].

The grey literature, which is included in this literature review but far from exhausted, may yield more specific information on monitoring as a barrier to or facilitator for CTC providers' performance.

4.5.4 Other intervention design factors

From the literature reviewed the following other intervention-design-related factors were found to have a bearing on the performance of CTC providers and/or the effectiveness of CTC interventions.

Position in the formal health system

To extent to which CTC providers are embedded in the formal health system is an often stated factor in the literature which is important for their performance. The availability of other health professionals, equipment and supplies and a functional referral system could be seen as preconditions (discussed in Section 4.4), but the extent to which CTC providers are aligned with these often depends on the setting and the specific features of the intervention. Related to this, we have found mainly information on the relationships of CTC providers with other health staff (which could in turn influence CTC providers' access to equipment and supplies and functional referral).

Attitudes of other health staff had a major effect on how CTC providers felt and, ultimately, performed. Good collaboration across service levels and a team approach in the intervention design

fostered confidence in the CTC providers and helped them to perform better [99]. However, where the institutional arrangements were such that the other health staff looked down on CTC providers [84, 98], did not trust them [92] or did not appreciate or acknowledge the possibility of learning from the experience of the CTC providers [206], it undermined CTC providers' motivation and hampered their performance.

The presence of standard operating procedures and explicit oversight mechanisms allowed good collaboration across levels and helped CTC providers perform better [99]. Unclear procedures (e.g. criteria for referral) hindered performance [145]. Similarly, clarity of roles and responsibilities (also discussed under health system factors but also important to be addressed at the intervention level) helped CTC providers to perform better [158]; a lack of such arrangements undermined their performance [140].

Workload-related factors

The workload of CTC providers was mentioned by many studies as being an important intervention design factor determining their performance [92, 96, 125, 169]. Kok et al. (2013) report that CTC providers being expected to be involved in non-core activities undermined their performance [178]. Others report workload related to record keeping as being a problem; multiple patient records resulted in a time burden and irregular hours [92, 169]. Some studies highlighted that CTC providers' performance could be positively influenced by keeping their workload in check [96, 124, 125, 207].

Transport

The availability of transport for CTC providers [114, 119, 121, 125, 156] or clients [119] was mentioned as a factor that could influence their performance. When intervention design did not sufficiently account for CTC providers' travel requirements [113, 125, 140], their performance suffered.

Recruitment

Recruitment of experienced staff, expectedly, helped improve the effectiveness of interventions [80, 82]. In a related observation, Viswanathan et al. (2012) note that the performance of CTC providers is best assessed after they have gained some experience, rather than early on in the intervention [80]. Smith et al. (2013) found that CHVs with more years of education performed slightly better than CHVs with fewer years of education [153].

Attainable objectives and simple intervention design

Gill et al. (2012) report that for CTC interventions to succeed they need to have attainable objectives and a simple intervention design [208]. Sanghvi et al. (2010) add that when the intervention messages are repeated and reiterated regularly, it helps improve the effectiveness of services [87].

Similarly, according to Edward et al. (2007), focused service delivery to a manageable number of beneficiaries helps CTC providers perform better [121]; and if there are too many beneficiaries [205] or the served area is too large [112], performance suffers. In a related observation, Puett et al. (2013) add that when an intervention works, it creates confidence in the beneficiaries, and that in turn helps to improve the CTC providers' performance [82].

Community involvement

Several authors report the importance of any CTC intervention drawing on the local community's knowledge and involvement [81, 144]. Authors report on the importance of engaging beneficiary communities to ensure their buy-in [107, 110, 117] and to ensure their ownership of the intervention [161]. Others report a variety of ways in which this could be done: through active advocacy with beneficiaries [106, 117, 184], with religious leaders [110] and by involving beneficiary communities in accountability processes [185]. Yirga et al. (2010) report that discrepancies between the intervention design and the local culture hampered the success of the intervention and performance of the CTC providers [100]. Behdjad et al. (2009) report that lack of support from the beneficiary community led to the intervention not being successful [148]. For more community factors, see Section 4.3.1.

Communication

We did not find many studies that covered communication as a factor influencing CTC providers' performance. A study by Chang et al. (2011) evaluated an mHealth intervention with peer health workers. Limited mobile phone access for patients threatened confidentiality and at the same time increased satisfaction with being able to use the phone of peer health workers. Costs of phone use were being covered by the intervention, and charging phones was a challenge [193].

Other intervention design factors

In one study by Simwaka et al. (2012) on the role of trained storekeepers in TB treatment, the presence of a mechanism for showing evidence of clients benefitting from services was mentioned as a factor that could influence the motivation and performance of CTC providers [150].

Summary

In addition to human resource management and QA aspects, other intervention design factors that had a bearing on the performance of CTC providers were: the need for a reliable and robust referral system; institutional arrangements such as good collaboration across service levels and teamwork; clarity of roles and responsibilities; presence of standard operating procedures and explicit oversight mechanisms; and the importance of engaging beneficiary communities to ensure their buy-in.

5. Discussion, implications for REACHOUT and conclusion

In this chapter we discuss the findings of our literature review, the limitations and the inferences for REACHOUT regarding both objectives (to give an overview of the available evidence regarding CTC providers' effectiveness; and to identify contextual factors that form barriers to or enablers of the performance of CTC providers and the services they provide). Then we discuss implications for the framework and draw a conclusion.

5.1 Effectiveness of CTC providers

5.1.1 Summary and discussion of findings

The moderate-quality evidence emerging from the existing systematic reviews shows the effectiveness mainly of promotional activities undertaken by *CHWs* on end-user outcomes; as yet, limited conclusive evidence on mortality and morbidity is available. The evidence reported here is primarily based on reviews that have applied rigorous review criteria. There is evidence of moderate quality that care provided by CHWs, compared to usual care, leads to the following outcomes [6]:

- probably an increase in the uptake of immunization in children;
- an increase in the number of women who initiate breastfeeding;
- an increase in the number of women who breastfeed their child at all;
- an increase in the number of women who breastfeed their child exclusively for up to six months;
- probably a reduction in neonatal mortality (many studies only from Asia);
- probably an improvement in pulmonary TB cure rates; and
- little or no effect on completion of TB preventive treatment.

There is low-quality evidence that CHWs, when compared to usual care, may reduce child morbidity and mortality (most evidence comes from studies on malaria interventions). CHWs may increase the likelihood of seeking care for childhood illnesses when compared to usual care. They also may reduce maternal mortality, but the quality of the evidence is again low, partly because of a lack of quality studies [6]. There is evidence on the effectiveness of CHWs in promoting and providing family planning, such as condoms and contraceptive pills. There are few studies available about the role and tasks of CHWs in the promotion and provision of other types of contraceptives, although there are some studies available that focus on their role in the administration of injectable contraceptives. WHO recommends initiation and maintenance of injectable contraceptives using a standard syringe by CHWs only with targeted M&E [27]. Regarding HIV and AIDS, CHWs seem to have a positive impact on end-user outcomes, such as condom use, counselling and testing and treatment adherence [46, 56-58, 60], but conclusive evidence on impact level is still missing.

Recent evidence on the effect of CTC providers in their occasional role as *facilitators of women's groups* shows that they can have an effect on both maternal and neonatal mortality [1]. Evidence on the effectiveness of *trained TBAs* on outcomes regarding maternal health is, as yet, not convincing, while their effect on neonatal health seems promising [21, 22, 32]. Regarding *auxiliary nurses and*

ANMs, evidence shows they are effective in conducting various maternal and neonatal health and family planning tasks [27].

The above shows that most evidence available refers to CHWs and less to other CTC providers, such as auxiliary staff. For several health subjects, such as child health and HIV and AIDS, more studies are needed to strengthen the evidence on the effectiveness of CTC providers in these fields.

5.1.2 Limitations

This literature review assessed available reviews on all health subjects and included various types of CTC providers, but only English-language reviews from 2007 until July 2013 were covered. We thus may have missed important information from reviews on the effectiveness of CTC providers published before 2007 or in other languages.

In addition, since this section is a review of the existing (systematic) reviews on the subject, the findings presented here are constrained by the methodological and scope limitations of the reviews themselves.

5.1.3 Implications for REACHOUT

The evidence presented in Chapter 3 has implications for the improvement cycles that are going to take place in six countries in years 2 to 5 of REACHOUT. As stated in Chapter 1, interventions with the potential to improve CTC services will be developed, based on an identification of how community context, health policy and interactions with other health system aspects influence the equity, effectiveness and efficiency of CTC services. Since we are interested in these factors that could influence performance of CTC providers (presented in Chapter 4 and discussed below in Section 5.2), those interventions should be selected that have been proven to be effective or are promising in this regard. This would enable us to do research on the influence of changes in one or two of the intervention design factors (as presented in our draft conceptual framework) on either CTC provider or end-user outcomes in each setting.

The initial health themes of interest for the six REACHOUT countries are: maternal and newborn health (Ethiopia and Indonesia), child health (with a focus on malaria) (Mozambique and Malawi), HIV and AIDS (Kenya and Malawi) and sexual and reproductive health (Bangladesh). Generally, evidence on the effectiveness of CTC providers regarding newborn health is of moderate quality, while on the other health themes of interest the quality is low. Still, interventions on these health themes can draw on single studies that were part of the included reviews, discussed in Chapter 3, as far as they are comparable to the setting of the specific REACHOUT country and area of implementation.

Ethiopia focuses on the improvement of maternal health by HEWs. The evidence suggests that promotional activities for maternal and especially neonatal health, including family planning, are promising, but there is no evidence that CHWs improve outcomes of deliveries, while neonatal resuscitation is recommended to take place under rigorous research conditions only. The situation is different in Indonesia, where village midwives are well trained to conduct deliveries. For both

countries, the initiation of women's groups facilitated by CTC providers is an interesting and evidence-based potential option to improve maternal and newborn health.

For Mozambique and Malawi, the literature included evidence for promising interventions on malaria prevention and treatment and childhood immunization conducted by CHWs. Furthermore, breastfeeding practices are of vital importance for improving the health of neonates and children, and the evidence shows that CTC providers can have an impact on the uptake of breastfeeding in general and exclusive breastfeeding in particular.

For Kenya and Malawi, there is some, though not sufficient, evidence to show that CTC providers can have an impact on adherence to ART. More studies are required to clarify the relationship between community support and ART outcomes and to explore the relationship between adherence and virological outcomes.

For Bangladesh, there is evidence that CTC providers can improve the uptake of family planning as well as exclusive breastfeeding.

5.2 Factors influencing CTC providers' performance

5.2.1 Summary and discussion of findings

This literature review identified many different types of factors that can influence the performance of CTC providers. Some studies address information on broad contextual factors and health systems factors, while most studies focus on the influence of various intervention design factors on CTC providers' performance. We use our conceptual framework to discuss and organize the findings of our literature review. We discuss the findings in light of the findings from other reviews and discussion papers on the same theme.

Broad contextual factors

Palazuelos et al. (2013) emphasize the importance of broad contextual (economic, sociocultural, historical and political) factors that influence CHWs' performance [73]. Broad contextual factors that emerged from the assessed literature include poverty/economic challenges, geographical factors, conflict/security issues and disease prevalence. In general, it is not easy to modify broad contextual factors, because they often are beyond the control of CTC provider programme planning. The direct influence of broad contextual factors on CTC providers' performance is difficult to prove. However, it is still important to consider their potential influence during the development, implementation, evaluation and scale-up of CTC interventions.

Policy factors

Policy factors that were found in our literature review included the availability of general CHW policies, human resource policies and legal issues. Bhutta et al. (2010) and Kane et al. (2010) also conclude that to be effective, CHW programmes should be coherently embedded with the wider health system, and CHWs should be explicitly included within the human resources for health strategic planning at country and local level [72, 209]. On the same issue, Hermann et al. (2009) list political support and a regulatory framework as one of the factors for success of CHW programmes

[210]. Policy factors can be important preconditions for the performance of CTC providers, but they are seldom explicitly discussed or reported by authors.

Community factors

Community factors that emerged as important in the literature included gender roles and norms; social and cultural norms and values; community acceptance, trust and respect; community expectations; community ownership and support (in selection, implementation of activities and supervision of CTC providers); safety and security; and the existence of disease-related stigma.

These findings are echoed in other reviews. A useful description of domains was developed by Evidence Review Team 1 of the US Government Evidence Summit on CHWs, which concentrated on community factors influencing CHWs' performance. The team identified four domains of community support: provision of access to those who can serve as effective CHWs, and access of CHWs to community members; creation of demand for CHW services; provision of support for CHWs; and facilitation of trust between the community and the CHW. It also found that there is very limited evidence from the literature and programmatic experiences that demonstrates the impact of these four domains on CHWs' performance. The team described the importance of CHWs being embedded in the community and also discussed the strong perceived need for curative services by communities, which we also found in our literature review [13].

Campbell et al. (2011) argue that if CHWs are not embedded in the community, they will be unable to successfully perform the socially oriented tasks assigned to them, such as health education and counselling. The authors considered that a CHW programme is embedded in the community when community members have substantial control over the selection, priority setting, planning and monitoring of CHWs' activities. However, communities can have complex power structures that tend to make the most marginalized people least likely to become involved in CHW programme governance [211]. In our literature review, we did not find many studies that reported on the way communities were involved in the selection of CTC providers.

The studies that did report on community involvement in selection more often also included community monitoring and supervision. Green (2011) found that the potential role of community monitoring in improving the performance of Volunteer Health Workers has not been explored in any depth in the literature, and there appears to be a complete absence of studies researching experiences of the implementation of community monitoring [212]. In our literature review, we found two good examples of community monitoring in a study on volunteer CHWs in Ethiopia [91] and CHVs in Madagascar [153].

Atkinson et al. (2011), in their systematic review on community participation, identified factors that influence the acceptability, ownership and use of services (related to communicable diseases) by various groups. These factors resemble many of the factors identified by our literature review, such as knowledge and perception of disease, stigma, acceptability of the intervention or programme, gender roles, power relationships and cultural norms. The authors state that CHWs are expected to improve access to health services, but vulnerable groups are still not reached by them, because CHWs have limited knowledge and understanding of the needs of vulnerable groups, risks of health problems, and entrenched gender roles and power relationships [213].

In summary, while community factors play a major role because CTC providers find themselves in between the health system and the community they serve, their impact on CTC providers' performance is not adequately covered in the current literature.

Health system factors

Health system factors can be seen as preconditions for the functioning of CTC services that require strategies at national, district and local level to ensure adequately functioning services, infrastructure and supply systems, an operational referral system and a supervision and monitoring system (see Figure 1). Health system factors can also address issues of more direct influence on CTC providers' working conditions (there should be clarity on roles and operating procedures, and the health system should accommodate CTC providers' expectations). Furthermore, we found that there is a need for an explicit buy-in from various state agencies to support the legitimacy of CTC providers.

Glenton et al. (2013), in their Cochrane review on barriers to and facilitators of LHW programmes for maternal and newborn health, also referred to health system factors as being important for the effectiveness of LHW programmes. They stressed mainly the importance of flexible and appropriate working conditions and adequate supplies. A reference was made to user fees; LHW services should be free or affordable [15]. The influence of user fees did not emerge from our literature review but may be important and related to CTC providers' performance. Smith Paintain et al. (2012), in their systematic review on the role of CHWs in malaria treatment, mentioned three elements of health system capacity found to be critical for effective CHW programmes: the ability to treat referred cases; regular supervision of CHWs; and a reliable and consistent supply chain for providing essential medicines and equipment at the community level [53]. Evidence Review Team 2 of the the US Government Evidence Summit on CHWs also identified several health system factors influencing CHWs' performance similar to our review, such as support from the local and national government, well-designed and clearly defined job descriptions and adequate resources to ensure that CHWs are properly equipped, supplied and supported [70].

Intervention design factors

As intervention design factors are the main focus of the available literature (rather than other types of influencing factors, as delineated in Figure 1), we first discuss these factors generally and then focus on the most discussed factors separately. To synergize our findings, we report in this discussion substantially on the findings of relevant factors from other reviews.

Summary of findings from the literature review

A significant number of the intervention design factors that were addressed in the studies included in this literature review were in the field of human resource management. Mainly, the issues of incentives (monetary, material and non-material) and supervision of CTC providers (type of supervisor, frequency and nature of supervision) were addressed. References to performance appraisal and career opportunities were almost entirely lacking. Other factors that could influence the performance of CTC providers that were identified in our review included initial training; refresher training; experience sharing through visits and review meetings; the use of job aids and training on the use of job aids; the use of predefined and agreed checklists for regular performance

monitoring; training of supervisors; (participatory) development of training materials; the method of training (combination of theoretical and practical learning); and the training of other cadres that work with CTC providers.

Except for indicating that protocols and guidelines were used, our review did not find much evidence on the effect or importance of the use of guidelines and protocols and the way these were developed or adapted. There was not much information either about M&E systems related to CTC providers and their services, nor the importance of the clarity of CTC providers' roles and how recruitment and selection processes influence their performance. Intervention design factors otherwise addressed in the literature included: integration of CTC providers into the formal health system; workload-related factors; the availability of transport; recruitment issues; the type of intervention design and the objectives of the intervention; community-related factors; and communication.

Insights from other reviews and discussion papers

Several reviews and discussion papers address the wide range of intervention design factors that were also identified in our literature review. Various models, frameworks, components and elements are emerging from these papers, and we discuss the most important ones here.

Glenton et al. (2013) [15], in their recently published Cochrane review, developed a logical model in which the outcomes of qualitative studies from their review were combined with the (forthcoming) effectiveness review of Lewin et al. (2013) [18]. Five components of LHW programmes form the basis of the model: integration of the LHW programme with other health services; LHWs' working conditions, training and supervision; user fees; LHW selection criteria; and support and participation from 'credible sources'. The five components identified by the model overlap to a large extent with the components identified in the framework developed for this literature review and confirm the findings of this review, except for the part on user fees, as this was not discussed as a specific issue in the literature we reviewed. However, we found that in some cases CHWs' incentives are derived from the drugs and services they sell, which implies that clients pay for services. This may form a barrier to the use of services, affecting affordability, which we identified as an intermediate factor.

Within these five components, Glenton et al. (2013) identified sub-components that are important for the functioning of LHW programmes. Often, these sub-components are related to intervention design and are similar to findings from our review. Integration of the LHW programme with other health services, the level of integration of the LHWs in the health system and the collaboration between individual LHWs and health professionals were mentioned as important factors for programmes to succeed. Several factors regarding LHWs' working conditions, training and supervision were discussed. First of all, there should be consistent and predictable incentives that LHWs regard as appropriate and fair in relation to their tasks and level of training. The importance of a career pathway was also mentioned. Furthermore, opportunities to share experiences with other LHWs, and systems where LHWs can voice their concerns were found to be important. A reasonable workload and manageable distances to cover were also mentioned. Lastly, appropriate training (including counselling and communication) and supervision were mentioned. Glenton et al. (2013) state that the selection of LHWs who live in the community or are otherwise socially similar to recipients and who possess certain personal characteristics such as trustworthiness, respect,

kindness and empathy is important for the success of LHW programmes. With regard to the importance of support from credible sources, both the health system and the community (community structures, local leaders and household decision-makers) were mentioned [15].

The 5-SPICE framework of Palazuelos et al. (2013) utilizes five elements which can serve as essential ingredients for structuring or analysing a CHW programme: supervision (including management plans and structures); partners (especially ownership and stewardship by national programmes, which is a health system factor in our conceptual framework); incentives (which are a key part of the larger theme of motivation and performance); choice (how CHWs are recruited, screened and selected, and why they choose to take the job); and education (including what CHWs bring to their job, and how they are trained) [73].

Jaskiewicz et al. (2012) analysed the literature regarding elements that influence CHWs' productivity in developing countries. They also present a model in which the work environment encompasses four essential elements that affect the productivity of CHWs: workload, supportive supervision, supplies and equipment, and respect from the community and the health system. They suggest that CHWs can function more productively and contribute to an effective community-based strategy if they have a manageable workload in terms of a realistic number of tasks and clients, an organized manner of carrying out these tasks, a reasonable geographic distance to cover, the necessary supplies and equipment (a health system-related factor in our conceptual framework), a supportive supervisor, and respect and acceptance from the community and the health system [214].

Other reviews and discussion papers arrived at similar findings, which we do not repeat here. We only present those that add a slightly different emphasis or perspective.

The report of the 1 million CHWs campaign (2012) emphasizes that the optimal design of CHW programmes should involve full-time paid CHWs combined with a volunteer part-time community health workforce [215]. Evidence Review Team 2 of the the US Government Evidence Summit on CHWs adds to this the importance of appropriate pre-service education and continuing in-service training [70]. Campbell et al. (2011), in their discussion paper on the role of CHWs in HIV and AIDS prevention and treatment, indicate six important lessons from past CHW programmes, drawing special attention to adequate retention strategies, good relationships with other health care workers and (the often neglected) embedding of CHWs in the community [211]. Bhutta et al. (2010), Hermann et al. (2009), Darmstadt et al. (2009), Bigirwa (2009), Prasad et al. (2007) and Lehmann et al. (2007) also identified the abovementioned intervention design factors influencing CHWs' performance [7, 32, 209, 210, 216, 217]. In the CHW Assessment and Improvement Matrix of Crigler et al. (2011), these intervention design factors (together with some community and health system factors) form a 15-component toolkit to assess the functionality of CHW programmes [194].

Incentives, motivation, job satisfaction and their effect on retention

Nkonki et al. (2011) identified various factors that could lead to attrition of LHWs — for example, inadequate or irregular pay, poor selection and better employment opportunities in other fields. Factors identified to reduce attrition included supportive supervision; well-defined roles with specified tasks; locally relevant incentives, deriving combined monetary and non-monetary benefits; recognition; training opportunities; community and policy support; and strong leadership [218].

Malarcher et al. (2011), in their review on the provision of DMPA by CHWs in several countries, found that retention rates were generally higher in programmes which selected CHWs based on past performance and personal characteristics [45]. Not a lot of information on selection and recruitment was available from the studies in our literature review, so this is a valuable addition to our findings.

We found that both salaries and non-monetary incentives can influence CTC providers' performance. The discussion about the fairness and sustainability of paying CTC providers is ongoing and not conclusive. Paying CHWs can result in unsustainable programmes and conflict between different cadres of workers. Campbell et al. (2011) state that for large CHWs programmes with many tasks, the involvement of unpaid CHWs is unfair and unsustainable [211]. Wringle et al. (2010) report that the most effective home-based care programmes incorporate remuneration for their workers [219], and Hermann et al. (2009) state that remuneration is essential for retaining CHWs in the long term [210]. Our review also showed that non-financial incentives such as worker recognition (uniforms, certificates, badges), opportunities for career advancement (which was discussed in only a few of the studies included in our review), supportive supervision and an enjoyable work experience can encourage CHWs to stay in the job. Clearly defined tasks and manageable workloads increase CHWs' job satisfaction. Gaining higher social status also results in retention of CHWs. Regular contact with the rest of the health system increases respect for and the success of CHW programmes.

Willis-Shattuck et al. (2008) conducted a systematic review on the impact of financial and non-financial incentives on motivation and retention. They concluded that financial incentives alone are not enough to motivate health workers (in general). It was clear from their findings that recognition is highly influential in motivating health workers and that adequate resources and appropriate infrastructure can improve morale significantly [220]. Rosato et al. (2008) also state that CHWs are most successful when they have the respect and support of governments, public service workers and the communities they serve [221]. These findings are supported by the findings of our literature review.

Kane et al. (2010) identified the following job satisfaction and motivation-related mechanisms for successful interventions involving CHWs: anticipation of being valued by the community; perception of improvement in social status; sense of relatedness with beneficiaries of public services; increase in self-esteem; sense of self-efficacy and enactive mastery of tasks; sense of credibility and legitimacy; and assurance that there is a system for back-up support [72]. These factors are also identified in several of the studies included in this literature review.

Regarding financial incentives, our literature review found that if CTC providers are selected from the community and/or by the community (leaders), their remuneration tends to be lower. The remuneration consists of stipends or allowances, rather than fixed salaries [81, 82, 91, 118, 222]. This might also be the case for 'expert patients' and treatment adherence workers [83]. CTC providers selected by health professionals or managers might have a higher remuneration, because they often hold a more formal position in the health system and, therefore, stricter recruitment rules and requirements are applied. The lower salary of community-selected CHWs may not necessarily lead to dissatisfaction, as can be learned from the above. However, the question needs to be raised how fair the large differentials in payment of CTC providers are.

Recruitment and selection

We found very few studies that discussed how recruitment and selection strategies affected the implementation or success of their interventions. We did find some evidence that CTC providers' experience and more years of education positively affected their performance [153]. These factors could be considered by CTC programmes to be taken up in their selection requirements. According to Campbell et al. (2011) and Bhutta et al. (2010), CHWs must be trusted members of the community and reflect the linguistic and cultural diversity of the population they serve [209, 211]. While most programmes state that CHWs should be selected by the community, in practice they tend to be selected by external health personnel. Local people may have limited time and resources to devote to CHW selection, and local politics and traditions may lead to the selection of community members with an a priori higher status but who are inadequate for the task. Balancing the influence of the community and outside administrators on selection could be a possible solution [211]. Atkinson et al. (2011) also suggest a mix of selection by leaders/health workers and communities to guarantee that CHWs have the necessary skills and represent different groups [213].

Training and continuous education

Atkinson et al. (2011) discuss that CHWs who receive only short training may lack legitimacy in the eyes of the community. Like many other studies, the authors conclude that training (including communication skills), refresher training and continuing education programmes are important [213]. In our literature review, we did not find conclusive evidence on the effect of training duration or content on the performance of CTC providers.

Multiple workloads

Task shifting often involves CTC providers as a mechanism to address the lack of (para-)professional human resources for health [223]. A concern is that the expansion of CTC provider programmes may lead to an increased workload for CTC providers, and the literature recognizes this as a threat to the effectiveness of CTC programmes. Hermann et al. (2009) mention that a broad range of tasks may strain the CHWs in the national programmes in Ethiopia and Malawi [210]. In Ethiopia, the introduction of the Health Development Army (HDA), in which someone in every five households is expected to be trained by an HEW on health-related issues and who subsequently has the role of educating the other surrounding households, aims at diminishing the HEWs' workload [224]. We found that curative tasks give CHWs better status and higher motivation [2, 213]. On the other hand, such tasks can increase their workload and may result in community members demanding more than the CTC providers can offer. We found no studies directed at establishing the optimal workload in specific situations related to CTC providers' tasks.

Supervision

Although our review of the literature found many studies in which the importance of supervision was stressed, we did not identify any that compared different types of supervision to draw conclusions on how supervision could best improve the performance of CTC providers. From one study we learned that on-the-job supervision could be most effective when CTC providers are based in a facility [160]. Another study found that lower frequency of supervision was associated with lower performance scores among CTC providers [153]. The exact content of the supervision was not often mentioned in the studies. Despite this, we found that effective interventions often seem to take an approach to supervision that is content-focused rather than administrative (such as checking

reports or records) [93]. An example of supervision serving as a (non-financial) incentive was presented by Amare (2011) on volunteer CHWs in Ethiopia [91]. A Cochrane review by Bosch-Capblanch et al. (2011) concluded that it is uncertain whether supervision (of health workers in general) has a substantive, positive effect on the quality of primary health care in LMICs and whether supervision is effective in the long term. The review included nine studies, and two of them included supervision of CHWs [225]. Atkinson et al. (2011) state that inadequate supervision may result in a lack of legitimacy of CHWs in the eyes of the community. Training of supervisors was also found to be important [213].

Integration of CTC providers into the formal health system

In their review, Byrne et al. (2011) found that TBAs' performance improved if they were well integrated into the health system, combined with community mobilization [226]. From our literature review, the importance of embedding CTC providers in the formal health system is obvious. CTC providers find themselves in between the health system and the community. This can result in a delicate balancing act, as CHWs are accountable to both sides (the extent depending on the context), which could sometimes lead to a burden on CTC providers.

Sustainability

Smaller programmes with the involvement of NGOs or research institutes have been typically associated with better outcomes than large-scale CHW programmes. These smaller programmes are generally able to place greater emphasis on training, supervision, support and payment in cash or in kind but are often quite limited in time. Long-term outcomes of large-scale CTC programmes of long-term or unlimited duration are often difficult to measure, because research projects often have a short lifespan [47]. Many of the included studies were shorter-term research projects, and it was not always clear whether, for example, supervision structures that were used would also be sustained after the research activity ended and CTC interventions continued. Some studies made reference to the integration of supervision within existing supervision structures and meetings (for example, Alamo et al. (2012) on community antiretroviral therapy and TB treatment supporters in Uganda [129]).

5.2.2 Limitations

In general, the literature review generated insufficient information and evidence on recruitment, characteristics and precise supervision and QA structures, as also reported by Glenton et al. (2013) [15]. It was not always clear from the studies whether incentives were related to the programme under research or to the research itself, which could have distorted findings of this literature review.

Only English-language studies from 2007 until July 2013 were covered in this literature review. The broad range of literature available on CTC providers led us to use a search strategy that employed specific terms to better focus the search results and implied doing more hand-searching than was foreseen. It is possible that we have missed some important references.

There are several knowledge gaps regarding CTC providers which need attention. The Global Health Workforce Alliance addressed this in its synthesis paper [227], and in November 2013 a paper on research gaps, co-authored by KIT, was published [228]. This literature review also did not

specifically look into the issue of cost-effectiveness of CHWs, as this is done in a separate assignment for the Global Health Workforce Alliance and results will be published in 2014 (co-authored by KIT).

5.2.3 Implications for REACHOUT

Within REACHOUT, six countries will go into two implementation cycles (years 2 to 5 of the programme), in which interventions that could improve the performance of CTC providers are going to be tested. In each of the countries, the interventions will be selected based on the outcomes of the in-country context analysis, combined with findings from this international literature review.

The literature brings to the fore many different types of intervention design factors that could be the focus of the interventions that are going to be developed. Research into different measures that address these factors and different combinations of these measures could yield more information about which factors have the potential to increase the performance of CTC providers and the effectiveness of the services they offer. Thus, the added value of research that will be conducted within REACHOUT is that it could identify mechanisms that contribute to an intervention's success or failure. For example, in one country, the supervision system of CTC providers could be adjusted in two different ways to gather information about which mechanisms or aspects of the intervention could best improve their performance, with the final aim of improving community health. In this way, the evidence base for CTC programmes could be strengthened.

Based on this literature review, the following intervention research areas could be interesting for REACHOUT:

- Different supervision mechanisms: also regarding supervision, many studies stress its importance but fail to specifically address the effectiveness of different types of supervision mechanisms.
- Community support mechanisms that could improve CTC providers' motivation and job satisfaction: many studies assume the importance of community involvement in designing, implementing and evaluating CTC programmes and in selecting and monitoring the performance of CTC providers. However, little evidence is available on how the extent to which CTC providers are embedded in the community could be improved to increase the effectiveness of CTC programmes.
- Measures that address communication between CTC providers and health professionals, not only to improve referral and cooperation but also to improve trust and relationships.
- Changes in referral systems, which could enhance CTC providers' job satisfaction and performance.
- The balance between curative and promotive/preventive tasks of CTC providers: CTC providers tend to be more and more involved in curative tasks. Evidence is needed on how curative tasks influence their motivation and job satisfaction. At the same time, how the addition of curative tasks influences their workload and performance of other tasks should be investigated.
- The influence of the profile of CTC providers on the effectiveness of the programme: there is still insufficient evidence on selection criteria and their effect on CTC providers' performance. There is little information on how gender and cultural factors influence the

choice of CTC providers and differences in optimal packages for the most effective design of interventions.

- The effects of various types of non-financial incentives that are provided by the programme/health system: it is accepted that CTC providers who do their CTC work as a regular, (near) full-time job should receive a salary. Many studies suggest that, in addition, non-financial incentives are essential to keep CTC providers motivated to conduct their job appropriately. However, there is a wide range of potential types of non-financial incentives that could enhance CTC providers' performance, and research is needed to understand which incentives are appropriate in which setting.
- M&E and how this could improve CTC providers' performance: there is a lack of research on how M&E systems could support CTC providers in their work.
- Different types of continuous learning programmes: not many studies have looked into continuous education or the effect of regular coordination and meetings between supervisors and CTC providers and among CTC providers, with the aim of increasing performance.

5.3 Implications for the conceptual framework

The literature review broadly confirms the relevance of our initial conceptual framework. Certain aspects could be adjusted slightly based on factors emerging as important (or absent) from the literature. The final adaptation of the framework will be done after all six countries have finished their context analyses.

The broad contextual factors presented at the base of the framework indeed have an effect on health system factors, intervention design factors and the performance and impact of CTC providers. Although not all studies take into account the influence of broad contextual factors, there was enough evidence on the influence of these factors on several aspects presented in the upper part of the framework. For example, economic challenges affect the potential to design appropriate conditions for CTC providers (a health system factor), which translates into decisions regarding incentives at the level of the intervention and exacerbate CTC providers' expectations regarding allowances and future salaries (related to CTC providers' motivation and job satisfaction).

The specific reference to policy factors and community factors also seems to be justified by our literature review. Policy factors are often taken as preconditions for the functionality of CTC interventions. Policy factors are currently presented as part of broad contextual factors in our framework, while the human resources for health policy aspects could also be seen as part of health system factors. Because of this, we could consider adjusting the framework and making policy factors a separate category. Regarding community factors, the findings from this literature review indicate that we should separately address: (broad) community context in which CTC providers are working and the CTC intervention takes place (for example, issues regarding gender roles and norms); and the direct involvement of the community in an intervention, which is part of intervention design factors (Section 4.3.1 covered both aspects combined).

Health system factors are relevant to CTC providers' performance, although only a few studies addressed them specifically. As discussed above, human resources for health policies are partly

overlapping with policy factors under broad contextual factors as presented in our framework. Some aspects under health system factors as mentioned in the framework were hardly discussed in the literature — for example, the effect of professional associations, and the organizational and financing model of the health system. These are important areas to take into account for further research.

Intervention design factors represent, as expected, a wide range of aspects that could influence CTC providers' performance. The reverse arrow (from CTC providers' performance towards intervention design factors) could be maintained, although the literature does not show many examples in which interventions were adjusted as a result of changes in CTC providers' performance.

5.4 Conclusion

This literature review identified the latest evidence regarding the contribution of interventions involving CTC providers to the delivery of effective care and contextual factors that form barriers to or enablers of the performance of CTC providers and the services they provide.

We identified CTC interventions within specific programmes that proved to be effective or were promising. These types of interventions will be the basis for REACHOUT improvement cycles in six countries. We identified factors influencing CTC providers' performance and discussed which of these could be taken as the focus for improvements under the REACHOUT programme, based on evidence from other contexts but mainly based on the fact that evidence is missing in general.

There is a wide range of literature available on CTC providers. Still, more in-depth information is needed on factors influencing their performance, because many studies do discuss these factors but do not specifically study them. Mechanisms that make interventions work or not are often not fully investigated, and context-specific factors are not always described. It is the ambition of REACHOUT to conduct research in six countries, taking into account these aspects, with the CTC provider at the centre, with the ultimate goal of improving community health.

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ANNEX 1 Search strategy

The full search strategy is available from the Royal Tropical Institute. The below presented search strategy is run in Embase. This search strategy was adjusted when needed for use in the other databases.

We based our search strategy on Lewin et al. 2010 [6] but added terms to accommodate the broader range of CTC providers. We combined CTC providers with the term 'health' (or 'primary health care' and 'community health services') and with impact or outcome measures and with specific search terms relating to either HRM, QA, M&E, community or policy factors. In general, limiters were: from 2003 till now, English language and LMIC.

We searched the following databases: Embase (3 April 2013), PubMed (1 April 2013), Cochrane library (2 April 2013), CINAHL (2 April 2013), Popline (26 March 2013) and NHS EED (2 April 2013).

Embase search string

CTC providers

#1	'voluntary worker' OR 'voluntary workers' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#2	'paramedical personnel' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#3	'health auxiliary' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#4	'peer group' OR 'peer groups' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#5	'health visitor' OR 'health visitors' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#6	doula OR doulas OR douladural? AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#7	(lay OR voluntary OR volunteer OR volunteers OR untrained OR unlicensed OR non+professionals OR non+professional OR nonprofessionals OR nonprofessional OR 'non professional' OR 'non professionals' OR informal OR 'non formal' OR non+formal) NEAR/5 (worker OR workers OR visitor OR visitors OR attendant OR attendants OR aide OR aides OR support OR support* OR person* OR person OR helper OR helpers OR carer OR carers OR caregiver OR caregivers OR consultant OR consultants OR assistant OR assistants OR staff OR visit* OR visit OR midwife OR midwives OR provider OR providers OR 'care giver' OR 'care givers' OR practitioner OR practitioners) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#8	paraprofessional OR paraprofessionals OR paramedic OR paramedics OR 'paramedical worker' OR 'paramedical workers' OR 'paramedical personnel' OR 'allied health personnel' OR 'allied health worker' OR 'allied health workers' OR 'support worker' OR 'support workers' OR 'home health aide' OR 'home health aides' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#9	trained NEAR/3 (volunteer OR volunteers OR 'health worker' OR 'health workers' OR mother OR mothers) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#10	(community OR communities OR 'community based' OR village OR villages OR frontline) NEAR/3 ('health worker' OR 'health workers' OR 'health care worker' OR 'health care workers' OR 'healthcare worker' OR 'healthcare workers' OR distributor OR distributors OR worker OR workers OR provider OR providers) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#11	(community OR communities OR 'community based') NEAR/3 (volunteer OR volunteers OR aide OR aides OR support) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#12	(birth OR childbirth OR labor OR labour) NEXT/1 (attendant OR attendants OR assistant OR assistants) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#13	monitrice OR monitrices AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#14	(lay OR peer) NEXT/1 (volunteer OR volunteers OR mentor* OR mentor OR counsel* OR support OR intervention OR interventions) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#15	'church based' NEAR/3 (intervention OR interventions OR program* OR program OR counsel*) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#16	linkworker OR linkworkers OR 'link worker' OR 'link workers' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#17	'barefoot doctor' OR 'barefoot doctors' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#18	outreach AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#19	home NEXT/1 (care OR aide OR aides OR nursing OR support OR intervention OR interventions OR treatment OR

	treatments OR visit* OR visit) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#20	(care OR aide OR aides OR nursing OR support OR intervention OR interventions OR treatment OR treatments OR visit* OR visit) NEAR/3 (lay OR volunteer OR volunteers OR voluntary) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#21	auxiliary NEAR/3 (worker OR workers OR nurse OR nurses OR midwives OR midwife) AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#22	'expert patient' OR 'expert patients' OR 'health promoter' OR 'health promoters' OR 'health extension worker' OR 'health extension workers' OR 'mentor mother' OR 'mentor mothers' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#23	#19 AND #20
#24	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #21 OR #22 OR #23

Health or primary health care combined with impact and outcome measures

#25	health AND (effectiveness OR efficiency OR equity OR 'health care utilization' OR 'patient compliance' OR 'patient attitude' OR 'patient attitudes' OR 'health care quality' OR 'patient satisfaction' OR 'cost effectiveness analysis' OR 'cost benefit analysis') AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#26	('primary health care' OR 'community care') AND (effectiveness OR efficiency OR equity OR 'health care utilization' OR 'patient compliance' OR 'patient attitude' OR 'patient attitudes' OR 'health care quality' OR 'patient satisfaction' OR 'cost effectiveness analysis' OR 'cost benefit analysis') AND [humans]/lim AND [english]/lim AND [2003-2013]/py

Searches related to HRM, QA, M&E, community and policy factors

#27	'performance appraisal' OR 'personnel selection' OR 'personnel recruitment' OR 'personnel turnover' OR 'staff development' OR workload OR remuneration OR motivation OR incentive OR incentives OR disincentive OR disincentives OR 'job satisfaction' OR 'job performance' OR retention OR supervision OR 'task+shifting' OR 'task shifting' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#28	'quality assurance' OR 'continuing education' OR 'management quality circles' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#29	'monitoring and evaluation' OR 'medical information system' OR 'medical information systems' OR 'mobile health' OR mhealth OR ehealth OR m-health OR e-health AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#30	'community participation' OR ownership OR empowerment OR gender OR accountability OR 'village health committees' OR 'village health committee' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#31	decentralization OR decentralisation AND [humans]/lim AND [english]/lim AND [2003-2013]/py
#32	#27 OR #28 OR #29 OR #30 OR #31

LMIC

#33	'low and middle income countries' OR lmic OR 'low income countries' OR 'low income country' OR 'middle income countries' OR 'middle income country' OR africa OR asia OR 'developing country' OR 'developing countries' AND [humans]/lim AND [english]/lim AND [2003-2013]/py
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Concluding searches

#34	#24 AND #25 AND #32 AND #33	1701 hits
#35	#24 AND #26 AND #32 AND #33	280 hits

ANNEX 2 Data extraction form

A. Existing situation (pre-intervention (if an intervention is described))	
Setting	Country
	Geographical setting (rural/urban including slums/non-slum)
	Healthcare setting (home, primary care facility, community, other)
	Health system (e.g. decentralized, public/private)
CTC provider	Name of CTC provider
	Characteristics (social, cultural, economic, demographic)
	Tasks (preventive, promotion, curative, single/multiple)
	Selection and recruitment process
	Other requirements (like education level)
	Other
Clients	Characteristics (social, cultural, economic, demographic)
	Other
Other stakeholders involved or influencing CTC provider (e.g. community, other health care providers, policy makers etc.)	Characteristics (social, cultural, economic, demographic)
	Other (for example: role)
B. Intervention (if there is)	
General description intervention	Objective of intervention
	Theory/ hypothesis (if available)
	Health issue(s) addressed (single or multiple focus)
	General description of the intervention (mode of delivery)
	Other
C. Detailed information applicable to intervention (only if B is filled in) or the existing situation (if only A is filled in)	
Support activities to maximise CTC provider performance (and how they worked or not)	HRM (e.g. incentives, supervision, performance appraisal..)
	QA (e.g. trainings, guidelines..)
	M&E
	Other
Resources used and their monetary equivalent – costs	
CTC provider	Perception (of intervention or situation)
Clients	Perception (of intervention or situation)
Other stakeholders (e.g. community, other health care providers, policy makers etc.)	Perception (of intervention or situation)
Outcomes	Health status and well-being (morbidity/ mortality/ incidence/ other)
	User end points (utilization/ health seeking behaviour/ empowerment/ other)
	CTC provider level (self-esteem/ motivation/ attitudes/ competencies/ adherence with standards and procedures/ job satisfaction
Mediating processes (access, quality, responsiveness, productivity)	
Factors affecting implementation (describe and fill in	Policy factors

type of evidence: is it researched, is it reported by author (in the discussion) or is it an interpretation by you as reader)	Community factors
	Health systems factors
	Intervention design factors and process of implementation
	Broad contextual factors (legal system, environment, economy..)
	Other
D. The study	
Study design (qualitative or quantitative and specify)	
Study objective	
Short description of the study	
Identified research gaps	

ANNEX 3 Characteristics of included reviews/ discussion papers (objective 1)

Review	Subject and CTC provider	Quality [16]	Studies reviewed	Studies in LMIC
Bhutta 2008 [34]	Maternal, newborn and child health - not focused on CTC providers, but studies with TBAs and CHWs were included and analyzed separately.	High	223 RCTs, 52 systematic reviews and 173 observational studies	396
Bhutta 2009 [33]	Stillbirths – trained TBAs and CHWs	Average	2 reviews and 8 intervention and observation studies on TBAs; 1 review and 2 observational studies on CHWs	8
Bhutta 2010 [209]	Various health subjects - CHWs	Average	326	237
Christopher 2011 [47]	Child health: curative interventions against malaria, pneumonia and diarrhea – CHWs	High	7	7
Darmstadt 2009 [32]	Neonatal health - trained TBAs and CHWs (they also cover skilled birth attendants, but they are non-CTC)	Average	3 reviews and 9 studies on TBAs; 11 studies on CHWs	20
Decroo 2013 [57]	HIV and AIDS - LHWs	Average	18	18
Denno 2012 [46]	HIV and AIDS and reproductive health – no focus on CTC providers, but some of interventions include them	Average	20	7
Giugliani 2011 [42]	Various health subjects – CHWs	High	23	23 (all in Brazil, upper middle income)
Glenton 2011 [49]	Child health, immunization – LHWs	Average	12	5
Gogia 2010 [29]	Neonatal health – CHWs	High	5	5, all Asia
Gogia 2011 [28]	Newborn care – CHWs and auxiliary staff	High	13	12
Hall 2011 [41]	Neonatal health, exclusive breastfeeding - TBAs, village based workers, auxiliary midwives, female health workers	Average	4	4
Hopkins 2007 [63]	Malaria – CHWs	Average	6	6, all Africa
Hundley 2012 [24]	Maternal health, prevention of PPH by using misoprostol – trained TBAs, ANMs, CHWs	High	10	10
Jolly 2012 [44]	Neonatal health, breastfeeding – peer supporters (local women)	Average	17	6
Kidney 2009 [20]	Maternal health – focus was not on CTC providers, but interventions included women groups and TBAs	High	13	13
Lassi 2010 [19]	Maternal and newborn health - Outreach workers: lady health workers/visitors, community midwives, community/village health workers, facilitators or TBAs	High	27	26
Lewin 2010 [6]	Various health subjects – LHWs	High	82	27
Lewin 2012 [18]	Various health subjects – LHWs	High	107	42
Malarcher 2011 [45]	Family planning – CHWs	Average	19	19

Medley 2009 [61]	HIV and AIDS prevention – peer educators	Average	30	30
Mwai 2013 [56]	HIV and AIDS - CHWs	Average	21	21
Nair 2010 [31]	Newborn health - CHWs, TBAs, ANMs, community volunteers	NA (discussion paper)	NA	NA, all Asia
Oladapo 2012 [23]	Maternal health, PPH prevention – lay persons in home setting	Average	0	0
Oyo-Ita 2011 [48]	Child health, immunization – no focus on CTC providers, but they were included in some interventions	High	6	6
Patel 2010 [51]	Child health, immunization – CHWs	Low (non-systematic)	Not specified	Not specified
Perry 2012 [3]	Various health subjects - CHWs	Low (non-systematic)	Not specified	Not specified
Prost 2013 [1]	Maternal and neonatal health – women groups	High	7	7
Renfrew 2012 [40]	Neonatal health, breastfeeding – LHWs (an other types of health workers)	High	52	16
Ryman 2008 [52]	Child health, immunization – CHWs (although CTC providers were not the focus of the review)	Average	25	25
Schiffman 2010 [30]	Perinatal health – community-based workers	Average	9	9 (all from Asia)
Sibley 2012 [22]	Maternal and neonatal health – trained TBAs	High	6	6
Smith Paintain 2012 [53]	Malaria - community drug/ medicine distributors (CDD/CMD), CHWs, community health volunteers, health surveillance agents, community implementers, community-owned resource persons, women leaders, mother coordinators	Average	42	42 (all Sub-Saharan Africa)
Sudfeld 2012 [43]	Neonatal health, breastfeeding – peer support groups	High	11	11
Suthar 2013 [60]	HIV and AIDS - no explicit reference to CTC providers, but community-based interventions	Average	117	84
Uneke 2009 [65]	Malaria – CHWs	NA (discussion paper)	NA	NA
WHO 2012 [27]	Task shifting – LHWs, auxiliary nurses and auxiliary nurse midwives	NA	NA	NA
Wiley-Exley 2007 [69]	Mental Health – no explicit reference to CTC providers, but community-based interventions	Average	17	17
Wilson 2011 [21]	Maternal and neonatal health – trained TBAs	High	13	13
Wouters 2012 [58]	HIV and AIDS, ART treatment for HIV positive persons – CHWs, community care coordinators, peer health workers, field officers, HEWs, lay counsellors, adherence supporters	High	30	30
Young 2010 [59]	HIV and AIDS – home based care by LHWs and family members	High	15	1

ANNEX 4 Overview included studies (objective 2)

First author, year and reference number	Country	CTC provider	Health focus	Study objective	Study type	Study quality (A or B) ²	Enablers of and barriers to CTC provider performance
Abbot 2011 [89]	India	Community Based Distributors (CBDs)	Reproductive health Distributing contraceptives, referral	To uncover the conflicting expectations that many CBDs experience: to comply with project objectives without violating local social norms that limit interactions across status boundaries	Participant observation, Qualitative	A	Barriers: broad contextual factors, community factors, intervention design factor
Agrawal 2012 [229]	India	CHWs: ANMs and AWW (Anganwadi workers)	Maternal health, family planning, child care Preventive and curative	To explore the relationship between the knowledge level of CHWs (AWWs and ANMs) and their antenatal home visit coverage and effectiveness of the visits, in terms of essential newborn health care practices at the household level in rural India	Quantitative	A	Enabler: policy factor
Ahmed 2008 [168]	Bangladesh	CHWs: Shasthya Sebikas (SSs)	Multiple preventive and basic curative services	To describe the story of the SSs - the BRAC model of sustainable community health workers, including its problems and prospects	Qualitative, descriptive	B	Enablers: intervention design factors Barriers: community factors, intervention design factors
Ajayi 2008 [188]	Nigeria	Community Medicine Distributors (CMDs)	Malaria in children less than 5 years Drug distribution and explanation	To determine the feasibility of introducing a new antimalarial drug to the community, especially in rural areas, and assess the community perception on its effectiveness	Qualitative	A	Enablers: intervention design factors, policy factors Barriers: community factors, health system factors

² A = appropriate quality, meaning at least 5 checklist questions answered with 'yes'. B = methodological weaknesses identified, meaning 4 or less questions answered with 'yes'. For the questions, see section 2.4.

Alam 2012 [90]	Bangladesh	CHWs	Maternal and neonatal health Promotion, preventive	To explore the issue of performance, identifying factors related to the level of activity of CHWs who remain on the registers and in their positions in urban slums in Bangladesh	Mixed methods	A	Enablers: community factors, intervention design factors
Alam 2012c [102]	Bangladesh	CHWs	Maternal and neonatal health Promotion, preventive	To assess factors related to retention of CHWs in urban slums in Dhaka where BRAC has implemented the Manoshi project	Mixed methods	A	Enablers: community factors Barriers: community factors, health system factors, intervention design factors
Alamo 2012 [129]	Uganda	Community antiretroviral therapy and tuberculosis treatment supporters (CATTs)	HIV Support for adherence, referral	To assess the performance of CATTs in scaling up ART in Reach Out, a community-based programme in Uganda	Mixed methods	A	Barriers: policy factor, community factor, intervention design factors
Amare 2011 [91]	Ethiopia	Volunteer CHWs (vCHWs)	Multiple	To document the implementation of the introduction of several non financial incentives for vCHWs and engagement of community anchors to support vCHWs and assess their effectiveness	Qualitative	B	Enabler: community factor, intervention design factors
Arem 2011 [164]	Uganda	Peer Health Workers (PHWs)	HIV Psycho-social support, ARV adherence	To better understand PHW trial results (showing decreased loss to follow up and decrease in virologic failure in the long term but not in the short term) and the underlying processes that led to those results	Mixed methods	A	Enablers: intervention design factors Barriers: intervention design factors, community factors
Azad 2010 [38]	Bangladesh	TBAs and facilitators of women groups	Maternal and neonatal health Preventive Referral, support	To test the generalizability and scalability of a community-based participatory approach with women's groups to address maternal and neonatal care in three rural districts of Bangladesh	Quantitative	A	Barrier: community factor, broad contextual factor

Baqui 2008 [230]	Bangladesh	CHWs	Neonatal health Promotion, referral	To evaluate the effect of 2 service delivery strategies (a home based care model and a community care model) on neonatal health in rural Bangladesh	Quantitative (cluster-randomized controlled trial)	B	Enablers: community factors, intervention design factors Barriers: health system factors
Baqui 2009 [231]	Bangladesh	CHWs	Neonatal health Preventive, curative	To report the relative effectiveness of neonatal infection management by CHWs, qualified medical providers, and other types of providers or no treatment, using surveillance data that CHWs collected while assessing, referring, and treating neonates in the home-care study arm of a cluster RCT	Quantitative (study reports on one cluster arm of a cluster randomized controlled trial)	A	Enablers: intervention design factors Barriers: community factors
Baqui 2009b [174]	Bangladesh	CHWs	Neonatal health Preventive, curative	To validate trained community health workers' recognition of signs and symptoms of newborn illnesses and classification of illnesses using a clinical algorithm during routine home visits in rural Bangladesh	Quantitative	A	Enablers: intervention design factors Barriers: community factors
Baqui 2009c [232]	Bangladesh	CHWs	Neonatal health Preventive, curative	To assess the effect of the timing of first postnatal home visit by community health workers on neonatal mortality	Quantitative	A	Enablers: intervention design factors Barriers: community factors
Bartos 2009 [109]	Bolivia	CHWs (called manzaneras de la salud in local language)	Maternal and neonatal health Promotion	To evaluate a programme with the aim to extend the duration of breastfeeding in children less than 6 months living in the area of the Corea Municipal Health Network, El Alto, Bolivia	Mixed methods	A	Enablers: community factors, intervention design factors Barriers: community factors, health system factors, policy factors

Behdjat 2009 [148]	Iran	Women Health Volunteers (WHVs) (urban CHWs)	Promotion of using participatory approaches	To show the application of action research to inform policy-makers about potential changes in health care delivery and to describe and analyse a pilot project that refocuses on the tasks of urban CHWs in the Islamic Republic of Iran	Qualitative	A	Enablers: health system factors, intervention design factors Barriers: community factors, health system factors, intervention design factors
Bhutta 2008 [122]	Pakistan	Lady Health Workers (LHWs), TBAs ('Dais')	Maternal, neonatal and child health Promotion, prevention	To investigate the feasibility of delivering a package of community-based interventions for improving perinatal care using LHWs and TBAs (Dais) in rural Pakistan	Mixed methods	A	Enabler: community factor Barrier: intervention design factor, health system factor
Bhutta 2011 [155]	Pakistan	LHWs, voluntary Community Health Committees (CHCs) and TBAs ('Dais')	Perinatal and newborn care Primary care, promotion, prevention	To evaluate the effectiveness of a community-based intervention package, principally delivered through LHWs working with TBAs and community health committees, for reduction of perinatal and neonatal mortality in a rural district of Pakistan	Cluster randomized effectiveness trial	A	Enablers: intervention design factors Barriers: community factors, health system factors
Bisimwa 2009 [161]	Congo	Community volunteers	Malnutrition among children under 5 years of age Prevention, promotion, curative	To assess the effectiveness of monitoring the growth of preschool-age children by community volunteers through village nutrition committees in a context of endemic malnutrition and armed conflict in South Kivu	Quantitative	A	Enablers: broad contextual factors, intervention design factors Barriers: intervention design factors, broad contextual factors
Bland 2008 [186]	South Africa	Lay (HIV and breast-feeding) counselors	Exclusive breast-feeding (EBF) (in both HIV-positive and HIV-negative women)	To report on an intervention designed to improve breastfeeding practices in all HIV-negative women and HIV-positive women who opted to breast-feed in a high HIV prevalence area with previously low rates of EBF (6% at 16 weeks)	Quantitative (nonrandomized intervention cohort study)	A	Enablers: intervention design factors Barriers: health system factors, community factors

Brenner 2011 [118]	Uganda	Volunteer CHWs	Child health Health education, counseling ("health promotion only" role	To assess volunteer community health workers' effect on child morbidity and health promoting behaviors	Mixed methods	A	Enablers: intervention design factors, community factors, health system factors
Burn 2008 [233]	Pakistan	Lady Health Workers (LHWs)	Basic health services (with emphasis on women and child health)	To discover and explore factors that cause LHWs to resign from Pakistan's LHW Programme by gaining an insight into the experiences and opinions of resigned LHWs and understanding how these impacted on their decision to leave the programme	Qualitative	A	Enablers: intervention design factors, policy factors Barriers: community factors, health system factor
Callaghan-Koru 2012 [92]	Malawi	HSAs	Childhood illnesses, family planning, TB, VCT for HIV Community case management	To explore health workers and managers perceptions about CCM provided by HSAs during the programme's first year in Malawi	Qualitative	A	Enablers: policy factors, community factor Barriers: policy factors, health system factors, intervention design factors
Callaghan-Koru 2013 [140]	Malawi	HSAs	Childhood illnesses Case management of childhood illnesses	To assess selected health systems support (supervision, drug supply and job aids) for a national community case management programme for childhood illnesses in Malawi during the first year of implementation	Mixed methods	A	Enablers: policy factor Barriers: health system factors, intervention design factors
Campbell 2008 [234]	South Africa	Volunteers	HIV and AIDS Promotion, home based care	To report on community perceptions of a 3-year project which sought to train and support volunteer health workers in a rural community in South Africa	Qualitative	A	Enablers: intervention design factors Barriers: community factors, intervention design factors, broad contextual factors
Celletti 2010 [235]	Brazil, Ethiopia, Malawi, Namibia, Uganda	CHWs	HIV Depending on country	To evaluate the contribution of CHWs with a focus on identifying critical elements of an enabling environment that can ensure they provide quality services in a manner that is sustainable.	Mixed methods	A	Enablers: health system factors, intervention design factors, policy factors

Chanda 2011 [190]	Zambia	CHWs	Malaria Promotion, prevention, treatment, referral in case of complicated malaria	To generate information on the capacity of CHWs to use Rapid Diagnostic Tests (RDTs) and Artemisinin-based Combination Therapy (ACT) as effective tools for Home Management of Malaria (HMM). It was anticipated that results from this study could inform policy on the feasibility and effectiveness of a large scale HMM programmes implemented by CHWs.	Mixed methods, prospective evaluation	A	Enablers: intervention design factors, community factors, health system factors Barriers: community factors
Chang 2011 [193]	Uganda	Peer health workers	HIV and AIDS Psycho social support, clinical and adherence monitoring	To evaluate the impact of the intervention of mobile phone used by peer health workers on aids care and assessing personal experiences with mobile phone use	Mixed methods	A	Enablers: intervention design factors Barriers: intervention design factors, broad contextual factors
Chen 2011 [143]	Malawi	Trained TBAs	Maternal and neonatal health Prevention, referral, uncomplicated deliveries	To evaluate the effectiveness a TBA training programme by measuring the TBAs reproductive knowledge and by gathering data on the outcomes of the deliveries they assisted. The additional objectives were to determine the effect of factors such as age and years of education of the TBAs, test frequency and time elapsed from the last course on knowledge scores.	Quantitative	A	Enablers: intervention design factors, health system factors, community factors Barriers: intervention design factors
Chibanda 2011 [93]	Zimbabwe	Lay workers	HIV, TB but for this specific study common mental disorders and depression Health education, promotion	To gather data on the effectiveness of problem-solving therapy for depression and common mental disorders by lay workers and to see if the intervention would be feasible, and if so to gather ideas about how best to implement it on a larger scale	Mixed methods	A	Enablers: intervention design factors, community factors Barriers: health system factors

Corbett 2013 [203]	Malawi, Nepal, Bangladesh, Uganda	CHWs	Newborn care Curative, referral	To examine the role of CHWs in the identification and referral of newborns with danger signs in pilot areas of four countries where the Save the Children's Saving Newborn Lives programme supported community based maternal and newborn care packages	Qualitative	A	Barriers: Health system factors, M&E
Cornman 2011 [191]	South Africa	(Trained) lay counselors	HIV Counseling, health education regarding safe sex	After an exploratory study, a pilot study was conducted at a South African Department of Health-accredited antiretroviral therapy clinic in the uMgungundlovu Health District of KwaZulu-Natal, to evaluate a lay counsellor delivered HIV risk reduction intervention for its feasibility, acceptability and fidelity	Qualitative	A	Enablers: intervention design factors
Counihan 2012 [180]	Zambia	CHWs	Malaria Home based malaria testing	To assess CHW ability to use malaria rapid diagnostic test safely and accurately up to 12 months post training, in the home setting	Quantitative	A	Barriers: health system factor, intervention design factor
Crispin 2012 [236]	Kenya	CHWs	Maternal health Home visits	To assess the performance of CHWs based on socio-demographic characteristics	Quantitative (cross sectional)	A	Enablers: intervention design factors
Dambisya 2012 [135]	Uganda	CHWs	HIV, family planning, sexual and reproductive health Prevention, counseling	To assess the policy and programmatic implications of task shifting in Uganda	Qualitative	A	Enablers: policy factor Barriers: health systems factor, community factor
Daniels 2012 [130]	South Africa	Lay Health Workers (LHWs)	Multiple Prevention, curative	To explore the contemporary development of LHW policy in South Africa and to explain how gender was considered in this process	Qualitative	A	Enablers: policy factors Barriers: policy factors, health system factors

Darmstadt 2010b [205]	Bangladesh	CHWs	ANC, postnatal care, IMCI Home visits, referral	To examine outcomes of the surveillance programme including 1) factors associated with coverage of postnatal assessment by CHWs and 2) factors associated with compliance with referral by CHWs	Quantitative	A	Barrier: community factor
Das 2008 [138]	India	Village Volunteers, Anganwadi workers	Malaria Promotion, preventive, curative	To assess the feasibility of establishing drug distribution centres through village volunteers in a tribal area in India where health-seeking practice of the community has been poor and to assess the impact of treatment of fever cases with chloroquine on morbidity, mortality and parasite prevalence in the community	Quantitative	A	Enablers: policy factors Barriers: community factors
Dawad 2011 [149]	South Africa	Community Rehabilitation Facilitators (CRFs)	Rehabilitation (care for people with disabilities) Referral, awareness raising, care	To identify lessons to be learnt from Community Based Rehabilitation (CBR) programmes using multi-skilled mid-level workers for increasing access to HIV care for people living in low-income rural areas without easily accessible health care infrastructure	Qualitative	A	Enabler: intervention design factors Barrier: intervention design factor
Dawson 2008 [132]	Nepal	Female Community Health Volunteers (FCHVs)	Child health, pneumonia Prevention, curative	To describe Nepal's efforts, starting from the mid-1980s, to develop and implement community-based management of pneumonia	Descriptive paper of 20 years experience of community-based management of childhood pneumonia in Nepal	B	Enablers: health system factors, intervention design factors, policy factors
Dewing 2012 [179]	South Africa	Lay counselors	HIV Counseling, promotion	To evaluate the coverage and barriers to the implementation of a counselling intervention in ARV clinics, conducted by lay counsellors in South Africa	Mixed methods	A	Barriers: community factor, intervention design factor

Diadhiou 2011 [133]	Senegal	Auxiliary midwives, trained TBAs	Maternal health	To demonstrate that a simple training programme would foster safe and correct provision of misoprostol by trained TBAs for PPH prevention	Quantitative	A	Enabler: community factor Barriers: intervention design factors, policy factor, health system factor
Diakite 2009 [110]	Guinea	Community-based distributors (who are part of the Village Health Committees (VHC)	Family planning Promotion	To highlight the VHC in the child survival project and the integration of family planning work, describe the VHC purpose, membership, and tasks, and conclude with some outcomes of Save the Children's family planning component in Mandiana and Kouroussa districts, Congo	Qualitative (descriptive)	B	Enablers: intervention design factors Barriers: community factors
Dick 2007 [189]	South Africa	Lay Health Workers (LHWs)	Multiple Prevention, promotion, curative	To evaluate the effect of LHW recruitment, training and deployment of successful treatment completion by new smear-positive TB patients among permanent farm dwellers	Mixed methods, unblended cluster randomized trial	A	Enablers: intervention design factors Barriers: broad contextual factors
Dil 2012 [94]	Ghana	Community-Based Surveillance Volunteers CBSVs	Multiple Prevention, promotion	To explore factors that motivate, and the challenges faced by CBSVs in the Northern Region of Ghana	Qualitative	A	Enablers: intervention design factors Barriers: intervention design factors, community factors, broad contextual factors
Edward 2007 [121]	Mozambique	Community Health Volunteers (CHVs)	Child health Health education	To measure under-five mortality reduction in a community-based child survival programme	Quantitative	A	Enablers: community factors, intervention design factors
Elmardi 2009 [117]	Sudan	Malaria Control Assistants (MCAs)	Malaria Diagnosis, treatment, home-based	To assess the feasibility and acceptability of home-based management of malaria (HMM) strategy using artemisinin-based combination therapy (ACT) for treatment and rapid diagnostic test (RDT) for diagnosis	Mixed methods	B	Enablers: intervention design factors Barriers: broad contextual factors, community factors, intervention design factors

Furth 2012 [95]	Zambia	CHWs	HIV and AIDS Promotion, curative, counseling (positive living and ART adherence counseling)	To test the hypothesis that by applying the CHW AIM tool and addressing programme weaknesses identified through the process, organizations will be able to improve the functionality of their CHW programmes. 3 Key questions formed the foundation for the CHW AIM operations research activity: 1 Does application of the CHW AIM tool contribute to CHW programme functionality improvement; 2 what is the relationship between programme functionality, CHW engagement and CHW performance; 3 what are the costs associated with implementing the CHW AIM tool and what is the incremental cost effectiveness associated with its use?	Mixed methods	A	Enablers: policy factors, intervention design factors Barriers: intervention design factors, community factors, health system factors
Ge 2011 [165]	China	CHWs	Multiple	To clarify the level of job satisfaction of Chinese CHWs between a metropolitan (Shenyang) and a small city (Benxi) in Liaoning province, China and explore its associated factors	Quantitative	A	Barriers: policy factor, health system factor
Gill 2011 [37]	Zambia	TBAs	Neonatal health	To determine whether training TBA's to manage several common perinatal conditions could reduce neonatal mortality in the setting of a resource poor country with limited access to healthcare	Quantitative	A	Enabler: intervention design factor Barrier: health system factor
Gill 2012 [208]	Zambia	TBAs	Neonatal health Prevention, promotion, curative	To provide relevant details on how interventions in the Lufwanyama Neonatal Survival Project were developed and how Zambian TBAs were trained to perform them	Quantitative	B	Enablers: intervention design factors Barriers: community factors

Gusdal 2011 [125]	Ethiopia, Uganda	Peer counselors	HIV Support, adherence ARV	To explore peer counselors' work and their role in supporting patients' adherence to ART in resource-limited settings in Ethiopia and Uganda	Qualitative	A	Enablers: intervention design factors Barriers: policy factor, community factor, intervention design factors
Hamer 2012 [141]	Zambia	CHWs	Multiple, including the integrated management of malaria and pneumonia	To assess the quality and safety of having CHWs in rural Zambia use rapid diagnostic tests (RDTs) and provide integrated management of malaria and pneumonia	Quantitative (cluster RCT)	A	Enablers: intervention design factors, health system factors Barriers: intervention design factors
Hien 2008 [199]	Vietnam	Community leaders (including village health workers)	Health education, promotion of healthy living environment in the community	To evaluate the effectiveness of an educational programme entitled 'Capacity building for community leaders in a healthy living environment,' and to assess the usefulness of a participatory style of education and the applicability of an inter-sectoral approach in the educational process	Mixed methods (randomized controlled study)	A	Enablers: intervention design factors
Hill 2008 [171]	Ghana	Community Based Surveillance Volunteers (CBSVs)	Neonatal health Promotion, curative	To provide information on intervention design by describing the process and information used to design a large scale community-based newborn intervention in Ghana (called Newhints)	Mixed methods	A	Enablers: intervention design factors Barriers: community factors
Hoke 2008 [170]	Madagascar	Community Based Distribution (CBD) workers	Family planning using injectable contraceptives Prevention, distribution	To inform the MOHFPSP (MoH, Family Planning and Social Protection) officials with evidence that CBD of DMPA could be provided safely and effectively by lay health workers in Madagascar	Mixed methods	A	Enablers: intervention design factors Barriers: intervention design factors, broad contextual factors

Hoy 2008 [111]	Laos	Village youth volunteers	HIV and AIDS, STIs Peer education, promotion	To assess the outcomes of the Lao Youth HIV and STI Response Project at the district and village levels in terms of: (1) the capacity of district project working teams to develop and implement their HIV and STI activity plans; (2) the sustainability of the project; and (3) the ability of young Lao people to respond to the risk of HIV and STIs through healthy behavior change	Qualitative	A	Enablers: intervention design factors, mediating factor (improved access to condoms) Barriers: broad contextual factors
Huber 2010 [184]	Afghanistan	CHWs	Family planning Promotion, contraceptive injections	To assess the increase in contraceptive use in rural Afghanistan	Mixed methods	B	Enablers: intervention design factors
Huicho 2008 [195]	Bangladesh, Brazil, Tanzania, Uganda	IMCI trained health workers (amongst others assistant clinical officers and nurse assistants)	Child health Curative, preventive	To assess how different categories of IMCI trained health workers vary in terms of quality of child care	Quantitative	A	Enablers: intervention design factors Barriers: intervention design factors, policy factors
Jack 2012 [187]	Uganda	Community Volunteer Workers	Palliative care	To evaluate the motivation for becoming a volunteer and the personal impact of being a palliative care Community Volunteer Worker in Uganda	Qualitative	A	Enablers: community factor, intervention design factor Barriers: health system factor, broad contextual factor
Jaffar 2009 [204]	Uganda	Field officers (who are trained lay workers)	HIV and AIDS Curative	To assess home-based HIV care, with lay workers delivering antiretroviral therapy and monitoring patients versus facility-based HIV care	Quantitative (cluster randomized equivalence trial)	A	Enablers: intervention design factors, health system factors
Javanparast 2011b [96]	Iran	CHWs	Multiple	To explore the perceptions of CHWs regarding their contribution to rural health in Iran	Qualitative	B	Enablers: community factor, intervention design factors

Javanparast 2012 [201]	Iran	CHWs	Female CHWs assist deliveries Prevention, promotion	To analyze the CHW training process in Iran and how different components of training have impacted on CHW performance and satisfaction	Qualitative	A	Enablers: intervention design factors, policy factors Barrier; intervention design factor
Kalyango 2012 [112]	Uganda	Community Medicine Distributors (CMDs)	Integrated case management of childhood illnesses (ICCM) of Malaria and pneumonia Curative	To compare the performance of CHWs in the dual management of malaria and pneumonia versus CHW management of malaria alone in children under five and to assess the factors influencing CHW performance	Mixed methods	A	Enabler: intervention design factor Barriers: health system factors, community factors, intervention design factors
Kebriaei 2009 [172]	Iran	CHWs (called behvarz in local language)	Multiple health focus Primary health care services	To investigate job satisfaction levels overall and in various areas among health care workers in the community and to suggest approaches that could improve job satisfaction	Quantitative (cross-sectional survey)	B	Enablers: intervention design factors Barriers: intervention design factors
Kim 2012 [116]	Uganda	Network Support Agents (NSAs) and PLWHIV groups	HIV Home based palliative care, adherence counseling, prevention, referral	To evaluate a programme that was aiming for: increased access and utilization of prevention, treatment, care and support services by households affected by HIV and AIDS, strengthening of the organizational capacity of PLHIV networks and empowering and training of PLHIV to deliver HIV and AIDS services	Qualitative	A	Enablers: community factor, intervention design factors
Kim 2012b [83]	Malawi	CHWs	HIV Care regarding PMTCT	To evaluate a CHW based patient case management system for PMTCT	Quantitative cohort study	A	Enablers: policy factor, intervention design factors Barrier: community factor
Kok 2013 [178]	Malawi	HSAs	Multiple	To assess motivation, job perception and satisfaction of HSAs in Mwanza district, Malawi	Qualitative	A	Enabler: policy factor Barriers: intervention design factors

Kouyate 2008 [67]	Burkina Faso	Women group leaders	Malaria Curative	To evaluate the feasibility and effectiveness of an intervention aimed at improving case management of malaria in under five children through primary caretakers in collaboration with local women groups and existing health centres	Quantitative (cluster randomized controlled effectiveness trial)	A	Enablers: community factors, intervention design factors Barriers: community factors
Lemay 2012 [196]	Malawi	HSAs, community-based distribution agents	mHealth	Aimed to answer: To what extent has the SMS network in Salima and Nkotakota districts a) reduced the communication gap between health workers and their district teams and increased access to information among these health workers? B) improved the ability of CHWs to provide quality services and care?	Mixed methods Evaluation of a pilot mHealth intervention	A	Enabler: intervention design factor, health system factor
Lewis 2010 [192]	Kenya	CHWs, TBAs	Multiple health focus Home visits, health education	To evaluate the Busia Child Survival Project in Busia and Samia districts, Kenya	Mixed methods	A	Enablers: health systems factor, intervention design factors Barrier: intervention design factor
Maes 2013 [97]	Ethiopia, Mozambique	CHWs	HIV and AIDS Prevention, promotion, recruitment of patients, support	To provide policymakers with a holistic understanding of how and why people become and remain CHWs and to generate in depth understanding of life histories that lead people to become CHWs, their reasons to stay CHWs in particular their relationships with intended beneficiaries after becoming CHWs and their social and economic aspirations	Qualitative	A	Enablers: community factors Barriers: community factor, health system factors, intervention design factors, broad contextual factors
Mannan 2008 [182]	Bangladesh	CHWs	Maternal and neonatal health Promotion	To study whether postpartum visits by trained CHWs reduce newborn breastfeeding problems	Cluster RCT	A	Enabler: intervention design factor Barriers: community factors

Martinez 2008 [126]	Uganda	Community Reproductive Health Workers (CRHWs)	Reproductive health Promotion	To assess the current practices, barriers and training needs of CRHWs	Qualitative	A	Enabler: intervention design factor Barriers: community factors, health system factors, intervention design factors
McPherson 2010 [85]	Nepal	Female Community Health Volunteers (FCHVs)	Maternal and neonatal health Health promotion	To assess the assumption that FCHVs are effective at promoting care-seeking and desired household practices and that a booklet will facilitate the communication of messages, reinforce the FCHVs' counseling and stimulate intra-household discussion	Qualitative	A	Enabler: intervention design factor Barrier: community factor
Medhanyie 2012 [207]	Ethiopia	HEWs	Multiple health focus	To assess utilization to maternal health services by women in rural villages in Ethiopia	Quantitative Cross sectional survey	A	Barriers: intervention design factors, community factors, health system factors and broad contextual factors
Miller 2012 [237]	Pakistan	TBAs	Family planning, deliveries, neonatal care, postnatal care Promotion, curative	To determine whether traditional birth attendants (TBAs) trained via the "SMART Dai" method were superior to untrained TBAs in knowledge and practice regarding maternal and newborn care	Cluster RCT	A	Enabler: intervention design factor
Moetlo 2011 [238]	South Africa	Community Home Based Care Workers (CHBWs)	Multiple health focus Prevention, promotion, curative	To evaluate the implementation of integrated community home-based care (CHBC) services in Vhembe District, Limpopo Province, South Africa	Quantitative cross sectional	B	Barriers: community factors, intervention design factors Enablers: intervention design factors
Mohan 2011 [144]	India	Anganwadi workers (AWWs), ASHAs	Child care Promotion	To assess the progress of Integrated Management of Neonatal and Childhood Illnesses (IMNCI) in India, to identify the programme bottlenecks, and also assess the effect on coverage of key newborn and childcare practices	Quantitative (analysis secondary data)	B	Enablers: health system factors Barriers: intervention design factors

Mukanga 2010 [113]	Uganda	Community Medicine Distributors (CMDs)	Malaria Curative	To assess community acceptability of the use of Rapid Diagnostic Tests (RDTs) by CMDs in Uganda	Qualitative	A	Enablers: intervention design factor Barriers: intervention design factor, community factors
Mukanga 2012 [239]	Uganda	CHWs	Malaria, pneumonia CCM (for children under 5)	To assess household access, utilization and acceptability of the use of Rapid Diagnostic Tests (RDTs) and Respiratory Rate Timers by CHWs following one year of implementation	Quantitative (cross sectional household survey)	A	Barrier: community, health system factors Enabler: intervention design factors
Mukherjee 2007 [173]	Focus on Haiti (for other parts of the study also data from Mexico, Peru, USA are included)	CHWs	Multiple health focus Promotion, prevention, curative	To describe the contribution of the non-governmental organization, Zanmi Lasante, to the HIV prevention and treatment scale-up and to the ongoing efforts to improve Primary Health Care (PHC) services in the public health system in Haiti	Mixed methods	B	Enablers: intervention design factors Barriers: health system factors, community factors
Mutalemwa 2009 [107]	Tanzania	Community implementers, also known as Community Directed Distributors (CDDs)	Community Direction Intervention (CDI) Multiple health focus Distribution of drugs	To determine the extent to which the CDI process can be used for the delivery of other health interventions with different degrees of complexity	Qualitative	B	Enablers: community factors, intervention design factors, mediating factors Barriers: intervention design factors, policy factors
Nasreen 2011 [86]	Bangladesh	CHWs: Shasthya Kormi (SK), Shasthya Sebika (SS), Newborn Health Workers (NHWs)	Maternal, neonatal and child health	To investigate whether a single dose of 400µg oral misoprostol could prevent PPH in a community home-birth setting and to assess its acceptability and feasibility among rural Bangladeshi women	Quantitative	A	Enablers: community factor, intervention design factor Barrier: community factor

Nelson 2012 [146]	South Sudan	Frontline Health Workers (FHWs), including TBAs, maternal-child-health workers, community midwives, CHWs	Mother and child health Community based delivery assistance	To develop, implement, and evaluate an evidence-based Maternal, Newborn, and Child Survival package for FHWs in South Sudan	Mixed methods	A	Enabler: intervention design factors Barrier: broad contextual factors
Nsabagasani 2007 [120]	Uganda	Voluntary community based drug distributors	Malaria Curative	To explore community perceptions, health worker and drug provider opinions of community based distribution of pre-packed antimalarials (HOMAPAK) and its effect on management of fever and use of other antimalarials	Qualitative	B	Enablers: community factors Barriers: community factors, intervention design factors, health system factors
Nyanzi 2007 [104]	Gambia	TBAs	Multiple Prevention, promotion, curative	To understand the different roles that TBAs play in rural Gambia, exploring within and beyond metaphors of health in order to examine broader socio-cultural constructs	Qualitative	B	Enablers: community factors, intervention design factors and policy factors Barriers: community factors, intervention design factors
Olang'o 2010 [84]	Kenya	CHWs	HIV Home Based Care (HBC) Prevention, promotion, curative	To examine the attrition rates of CHWs from the HBC programme in Nyang'oma division, Bondo district, Nyanza province in western Kenya and to examine the trend, proximate and underlying causes and discuss the implications of attrition on the health care system and on support to those living with HIV and AIDS	Qualitative	A	Enablers: intervention design factors Barriers: intervention design factors, community factors
Omer 2008 [163]	Pakistan	Lady Health Workers (LHWs)	Multiple	To demonstrate the effective use of community-based evidence for health promotion by LHWs in Sindh province, Pakistan	Quantitative	A	Enablers: intervention design factors Barriers: community factors

Osawa 2010 [101]	Zimbabwe	Care Facilitators (CFs)	HIV home based care Prevention, promotion, curative	To understand the sociodemographic factors influencing the motivation and sustainability of CFs engaged in a community home-based HIV and AIDS programme, and the association between motivational outcomes, self-assessed performance, and CFs' perception toward the work and work environments in the community home-based HIV and AIDS programme in Masvingo Province, Zimbabwe	Quantitative	B	Enablers: community factors, intervention design factors Barriers: community factors, intervention design factors
Peltzer 2010 [158]	South Africa	Lay HTC counselors	HIV Prevention, promotion, counseling, testing	To evaluate the feasibility, fidelity, and effect of a HIV risk reduction intervention delivered to HIV-infected patients by lay counsellors during routine HIV counselling and testing (HCT) public service in Mpumalanga, South Africa	Mixed methods	B	Enablers: intervention design factors Barriers: intervention design factors
Perez 2009 [142]	Mali	CHWs	Child health Promotion, preventive	To assess the performance of CHWs in the promotion of child health services at the household level in the district of Djenné, region of Mopti, Republic of Mali	Mixed methods	A	Enablers: intervention design factors Barriers: community factors, intervention design factors
Pongvongsa 2011 [222]	LAO PDR	Village Health Volunteers (VHVs)	No info on focus Prevention, promotion, curative	To identify determinants of monthly reporting among VHVs in a rural district of Lao PDR	Quantitative	B	Barriers: health system factors, broad contextual factors
Posner 2009 [76]	Nepal	Peer Educators (PEs)	Caste-associated menstrual prohibitions and the vulnerability of adolescents girls and women to HIV HIV risk awareness	To examine how self-efficacy and collective efficacy function to bring about individual and normative behavioral change among the adolescent girls who facilitated a non-formal education programme	Quantitative	A	Enablers: intervention design factors Barriers: community factors

Prata 2009 [156]	Ethiopia	Trained Traditional Birth Attendants (TTBAs)	Maternal health, Deliveries Treatment	To determine the safety and feasibility of home-based prophylaxis of postpartum hemorrhage (PPH) with misoprostol, including assessment of the need for referrals and additional interventions	Intervention trial, mixed methods	A	Enabler: intervention design factor
Prata 2012 [240]	Bangladesh	Trained TBAs	Maternal health, deliveries Referral	To evaluate TBA's knowledge acquisition, knowledge retention and changes in attitudes and practices related to PPH management in home births after undergoing training on the use of misoprostol and a delivery mat	Quantitative	A	Enablers: intervention design factors
Prata 2012b [81]	Nigeria	Community Oriented Resource Persons (CORPs), drug keepers, trained TBAs	Maternal health Counseling, referral	To demonstrate the importance of community mobilization in the uptake of a health intervention, namely, community-based distribution of misoprostol to prevent PPH	Quantitative	A	Enablers: policy factor, intervention design factors Barriers: community factors
Prytherch 2012 [103]	Tanzania	Auxiliary staff and also non CTC providers	Maternal and neonatal health	To understand the term motivation, to identify what encourages and discourages providers of MNH care in rural areas and which factors influence their performance and job satisfaction	Qualitative	A	Enablers: policy factor, community factors Barriers: community factors, health system factors, broad contextual factors, intervention design factors
Puchalski Ritchie 2012 [124]	Malawi	HSAs	TB Many tasks on treatment, support	To identify and explore barriers and facilitators to LHWs' efforts to support anti-TB treatment adherence in Malawi	Qualitative	A	Barriers: intervention design factors, health system factors
Puett 2013 [82]	Bangladesh	CHWs	Child health: immunization, ARI, malnutrition Prevention, promotion	To assess the quality of care provided by CHWs in managing cases of severe acute malnutrition by provision of community-based management of acute malnutrition protocols	Mixed methods	A	Enablers: policy factor, intervention design factors Barriers: community factor

Rahman 2008 [162]	Pakistan	Lady Health Workers (LHWs)	Mental health Prevention	To assess the effect of an intervention (that integrated cognitive behavior therapy-based intervention into the routine work of community-based primary health workers in rural Pakistan) on maternal depression and infant outcomes	Quantitative (Cluster RCT)	A	Enablers: intervention design factors
Rahman 2008b [166]	Bangladesh	Shasthya Shebikas (SS), CHWs	Multiple: MNCH, Malaria, midwifery, TB, antenatal care Prevention, promotion, curative	To explore whether and how the income earning capability varied among the new and old SSs, due to introduction of MNCH activities in the Nilphamari district of northern Bangladesh, including factors influencing their motivation and sustenance	Quantitative	B	Enablers: intervention design factors, community factors Barriers: intervention design factors, community factors
Rahman 2010 [169]	Bangladesh	CHWs	Maternal and neonatal health Prevention, promotion, curative	To assess factors affecting recruitment and retention of CHWs who were part of an intervention trial that evaluated effectiveness of two different service delivery models of a package of maternal and newborn care	Mixed methods	A	Enablers: intervention design factors Barriers: intervention design factors, community factors
Razee 2012 [77]	Papua New Guinea	Various rural health workers: health extension officers, officers-in-charge, sisters-in-charge, CHWs and nursing officers	Not described, focus of article was on motivation and performance of health workers	To investigate how social factors impact on health worker motivation and performance in rural health services in Papua New Guinea	Qualitative	A	Enabler: community factors Barrier: community factors
Root 2011 [78]	Swaziland	Trained caregivers	HIV and AIDS Home care	To explore the concept of religious health assets (RHA) and its relevance to HIV and AIDS	Qualitative	A	Barrier: broad contextual factors
Rowe 2007 [136]	Kenya	CHWs	Child health	To assess the effect of quality improvement interventions and explore the effect of other non-intervention related factors on CHW performance in Siaya district, Kenya	Quantitative (cross sectional survey)	A	Enablers: intervention design factors Barriers: intervention design factors

Rowe 2007b [137]	Kenya	CHWs	Child health Treatment	To investigate the changes in CHWs' adherence to treatment guidelines over time and to assess whether refresher training had an immediate or enduring effect on adherence	Quantitative (longitudinal study)	A	Enablers: intervention design factors Barriers: intervention design factors
Ryman 2011 [175]	India	Auxiliary Nurse Midwives (ANM)	Immunization Primary care	To strengthen immunization service quality (measured by increased vaccination coverage and decreased dropout rates); and to evaluate factors associated with successful (or unsuccessful) implementation of the RED approach in Assam, India	Quantitative	A	Enablers: intervention design factors Barriers: community factors, health system factors
Sadler 2011 [79]	Bangladesh	CHWs	Child care Prevention, curative	To examine the effectiveness and feasibility of adding diagnosis and treatment of Severe Acute Malnutrition (SAM) to the Community Case Management (CCM) package delivered by community health workers outside health facilities in Barisal, Bangladesh	Qualitative	A	Enablers: community factors, intervention design factors Barrier: health system factor
Sahay 2011 [181]	India	Peer educators	HIV and AIDS Promotion, preventive	To describe steps and experiences in the establishment of Community Involvement Plan of the National AIDS Research Institute in Pune, India and lessons learnt in this process	Qualitative (descriptive)	B	Enablers: community factors, intervention design factors Barriers: intervention design factors, community factors
Saleem 2007 [241]	Pakistan	TBAs	Home deliveries	To determine the safety of 0.6% chlorhexidine vaginal and neonatal wipes and to estimate whether a randomized trial of 0.6% chlorhexidine vaginal and neonatal wipes could be conducted in home-delivery settings in Pakistan	Mixed methods (including a randomized controlled trial)	A	Enablers: intervention design factors Barriers: community factors
Sanghvi 2010 [87]	Afghanistan	CHWs	Maternal and neonatal health Prevention of PPH by distributing misoprostol	To test the safety, acceptability, feasibility, and effectiveness of community-based education and distribution of misoprostol by CHWs for prevention of postpartum hemorrhage at home birth in Afghanistan	Quantitative (non randomized experimental design)	A	Enablers: intervention design factors, health system factors, community factor

Sanjana 2009 [131]	Zambia	Lay counselors	HIV Counseling and testing	To review the effectiveness of lay counsellors in addressing staff shortages and the provision of HIV counselling and testing services	Mixed methods	A	Enablers: intervention design factors, policy factors Barriers: health system factors, intervention design factors
Saravanan 2011 [159]	India	Trained TBAs	Maternal health Deliveries	To assess the ways in which a TBA training programme in India has been successful in disseminating evidence-based knowledge on birthing practices	Quantitative	A	Enablers: community factors Barriers: community factors, intervention design factor
Saravanan 2012 [206]	India	TBAs	Design of a TBA training programme Deliveries	To assess the extent to which there is a synthesis of both biomedical and locally practiced knowledge in the content and community involvement in the design of a TBA training programme in India.	Qualitative, descriptive	B	Barrier: community factor, intervention design factors Enabler: community factor
Sarma 2011 [197]	Bangladesh	Non-formal providers (including traditional healers, CHWs, village doctors, drug sellers)	STI Counselling	To assess the impact of using public health detailing through medical representatives of private pharmaceutical companies to improve STI counselling services provided by non-formal providers in Bangladesh	Quantitative (cross sectional study)	A	Enablers: intervention design factors
Satti 2012 [242]	Lesotho	TBAs (who became later clinic affiliated maternal health workers)	Maternal health No info	To report the experience in rural Lesotho, where Partners in Health (PIH) in partnership with the Lesotho Ministry of Health and Social Welfare has implemented a pilot programme that provides comprehensive care for pregnant women from the community to the health center level, linking key primary care services (including HIV testing and treatment) to antenatal care (ANC) and facility-based delivery	Quantitative, (uncontrolled before-after study)	B	Barrier: broad contextual factors Enabler: intervention design factors, health system factors

Schneider 2008 [105]	South Africa	CHWs (as umbrella concept for amongst others Community Development Workers, Community Development Practitioners, Mid-level Worker, Community Caregivers, Child and Youth Care Workers, Youth Workers, Probation Officers/Community Service Officers and Early Childhood Development Practitioners)	Multiple health focus, including HIV, TB Prevention, promotion	To examine the current generation of CHWs in South Africa in the light of the history and international experience with CHWs, with a focus on their central role in the response to HIV and AIDS, to analyze the national policy context and then report on the empirical reality of CHWs in the primary health care system of one of the nine provinces (Free State) of the country, and to discuss the effectiveness, tensions and prospects of sustainability of CHWs in the South African health system	Qualitative	A	Enablers: intervention design factors, policy factors Barriers: health system factors
Scott 2010 [108]	India	ASHAs	Maternal and child health, family planning Prevention, promotion, curative	To insights into how best to support CHW programmes	Qualitative	B	Barriers: community factors, health system factors
Shah 2007 [200]	Pakistan	Non-formal providers (sex-clinic practitioners)	Sexually Transmitted Diseases (STDs) (including HIV) Curative	To assess whether introducing training for syndromic case management to Pakistani sex-clinic practitioners, with or without the provision of STD syndromic packets, could enhance the quality of the care they provide to symptomatic men	Quantitative (randomized, controlled, three-armed trial)	A	Enablers: intervention design factors Barriers: health system factors, community factor
Shah 2010 [106]	Bangladesh	CHWs	Neonatal health Prevention, cleaning of umbilical cord	To research practical implications and operational challenges associated with the deployment of large cadres of community-based workers within an efficacy trial of chlorhexidine for cleansing the umbilical cord	Case study within a cluster RCT	A	Enablers: intervention design factors, community factor

Shankar 2009 [185]	Indonesia	Community facilitator	Maternal health (micronutrient deficiencies in pregnant women) Promotion, preventive	To examine the additional health-care impacts that have resulted from the overall engagement of the Supplementation with Multiple Micronutrients Intervention Trial (SUMMIT) programme activities within the community and the role of the community facilitators in promoting positive health behaviors	Quantitative (randomized, double-blind, controlled clinical trial)	A	Enablers: intervention design factors Barriers: community factors, intervention design factors
Simba 2009 [167]	Tanzania	Peer educators	Reproductive health, Sexually Transmitted Infections (STI) Education, support, referral	To explore the motive behind voluntarism among adolescent peer educators in Mbeya region, Tanzania with a view to making recommendations on strategies for sustaining peer education activities	Mixed methods	A	Barriers: intervention design factors, community factor
Simon 2009 [123]	Mozambique	Agente Polivalente Elementar (APE), TB volunteers, Agente Comunitário de Saúde (ACS), TBAs, HIV support groups	Multiple health topics Prevention, support, curative	To present a participant-observer description of the evolution of community health worker support to the health services in Angonia district, Mozambique	Qualitative, descriptive	B	Enablers: intervention design factors Barrier: health system factors
Simwaka 2012 [150]	Malawi	Trained informal providers (shop owners)	TB Advise on medicine, referral	To determine the effectiveness and acceptability of a store keeper based referral system for TB suspects in urban settings of Lilongwe, Malawi	Mixed methods	A	Enablers: intervention design factors Barriers: health system factors
Smith 2007 [128]	Pakistan	Different 'Support workers' (including Lady Health Workers (LHWs), Lady Health Visitors (LHVs), lady health assistants and CHWs)	Multiple (TB, maternal and child health)	To learn from Pakistan's experience with support workers to improve access of the UK system for ethnic minority groups	Qualitative	B	Enablers: policy factors, intervention design factors Barriers: policy factors, intervention design factors

Smith 2013 [153]	Madagascar	Community Health Volunteers (CHVs)	Multiple Prevention, promotion, curative	To synthesize the findings from a qualitative and a cross-sectional study on CHV programme functionality and performance in Madagascar	Mixed methods	A	Enablers: intervention design factors, community factors, health system factors Barriers: intervention design factors, community factors, health system factors, policy factors, broad contextual factors
Soofi 2012 [243]	Pakistan	Lady Health Workers (LHWs)	Single focus. Pneumonia in children aged 2-59 months Prevention, treatment	To establish whether community case identification and management of severe pneumonia by oral antibiotics delivered through community health workers has the potential to reduce the number of infants dying at home	Quantitative (Cluster RCT)	A	Barriers: community factors, health system factors Enabler: QA
Sranacharoenpong 2011 [244]	Thailand	Community Health Care Workers (CHCWs)	Diabetes and other diseases Health promotion, basic health care	To investigate barriers to and support for implementing a community-based diabetes prevention education programme for CHCWs and to get preliminary input into programme design from the perspectives of health-care professionals and potential programme recipients of Chiang Mai province, Thailand	Qualitative	A	Enablers: intervention design factors
Srivastava 2009 [119]	Uttar Pradesh, India	ASHAs	ANC, PNC, maternal health Primary medical care, education, counseling	To conduct a rapid appraisal of the functioning of ASHA in the community and her interface with community and service providers	Mixed methods	B	Enablers: intervention design factors, community factors Barriers: health system factors, intervention design factors, community factors
Stanback 2007 [198]	Uganda	Community Reproductive Health Workers (CRHWs)	Family Planning Contraceptives, referral	To compare the safety and quality of contraceptive injections by community-based health workers with those of clinic-based nurses in a rural African setting	Mixed methods (non-randomized community trial)	A	Enablers: intervention design factors Barriers: health system factors

Suri 2007 [245]	South Africa	CHWs	TB, HIV Monitoring DOTS, education, promotion	To examine the perspectives of CHWs to identify ways of improving the current CHW programme to more effectively combat the spread of HIV infection and TB in South Africa	Mixed methods	A	Barriers: intervention design factors, health system factors, community factors
Takasugi 2012 [98]	Kenya	CHWs	Multiple health focus Preventive, promotion	To examine determinants of work motivation of voluntary CHWs in Kenya	Qualitative	A	Enablers: community factor, intervention design factors Barriers: community factors, health system factor, intervention design factors, broad contextual factors
Teela 2009 [99]	Myanmar	Maternal Health Workers (MHWs)	Maternal Health Prevention, promotion, curative	To evaluate the feasibility and impact of community-based provision of evidence-based maternal health interventions via the Mobile Obstetric Maternal Health Worker (MOM) project in eastern Burma	Qualitative	A	Enablers: intervention design factors, community factors Barriers: broad contextual factors, community factors
Teklehaimanot 2007 [114]	Ethiopia	HEWs	16 packages of the Health Extension Package (HEP)	To assess the working conditions of the first batch of HEWs (deployed in early 2005) and their job satisfaction	Qualitative	B	Enablers: intervention design factors Barriers: health system factors, community factors, intervention design factors and broad contextual factors
Tenthani 2012 [160]	Malawi	Expert patients (PLHIV)	HIV, ART Health education, promotion, advice	To assess the performance and acceptability of expert patients in HIV care provision in Zomba Central Hospital	Mixed methods	A	Enabler: intervention design factor
Torpey 2008 [151]	Zambia	Health Care Workers (HCWs) and Adherence Support Workers (ASWs)	HIV and AIDS Adherence counseling, ART	To assess the effectiveness of ASWs in adherence counseling, treatment retention and addressing inadequate human resources at health facilities	Mixed methods	A	Enablers: intervention design factors

Uzochukwu 2008 [202]	Nigeria	Community Health Extension Workers, CHEWs)	IMCI	To assess if shorter training on IMCI will improve performance of health workers	Mixed methods	A	Enabler: intervention design factor Barriers: health system factors, intervention design factors
Vernon 2009 [134]	Honduras, Guatemala	Auxiliary nurses	MNCH Vaccination, treatment, referral and provision of FP Intra-Uterine Devices (IUDs) in intervention	To find out whether nurse auxiliaries could safely provide IUD services and vaginal cytology samples of high enough quality	Mixed methods, action research	B	Enablers: intervention design factors Barriers: policy factors, intervention design factors
Vichayanrat 2012 [145]	Thailand	Lay Health Workers (LHWs)	Oral health Promotion	To demonstrate the application of the social ecological model to oral health interventions and to evaluate its effects on oral health practices among caregivers of children in Thailand and their determinants at multiple levels	Semi-experimental design using mixed methods	B	Enabler: intervention design factor Barriers: community factors, health system factors
Viswanathan 2012 [80]	Afghanistan	CHWs	FP, ANC, maternal health Prevention, promotion, curative	To determine if presence of a CHW in the community is associated with increased use of modern contraception, antenatal care (ANC) and Skilled Birth Attendance (SBA) in Afghanistan	Quantitative (household survey)	A	Enablers: policy factors, intervention design factors, mediating factors Barriers: community factors, mediating factors
Wang 2011 [246]	China	Community health volunteers	No specific focus Prevention	To determine whether perceptions of a volunteer organization environment are associated with volunteer intention and whether this relationship is mediated by self-efficacy and motivation	Quantitative	A	Enabler: intervention design factor

Warren 2013 [88]	Mali	Rural auxiliary midwives ('matrones')	Maternal health Skilled birth attendance	To describe the lived experiences of rural auxiliary midwives, or 'matrones' in Mali so as to better understand how being a matrone affects their lives	Qualitative	A	Enablers: policy factors, health system factors, community factors, intervention design factors Barriers: community factors, intervention design factors
Winch 2008 [176]	Mali	CHWs	IMCI, Malaria Prevention, promotion, curative	To: a) evaluate community promotion of zinc treatment and identify more effective channels of communication b) identify and resolve obstacles to implementation of zinc through community health centers and through a system of village drug kits managed by CHWs and c) identify factors that facilitate or impede the adoption of appropriate home management (treatment) of diarrhea, including supplementation with zinc	Mixed methods	A	Barriers: community factors
Wools-Kaloustian 2009 [127]	Kenya	Community Care Coordinators (CCCs)	HIV Prevention, promotion, curative	To assess a model for extending antiretroviral care through Community Care Coordinators, regarding acceptability and feasibility	Mixed methods	A	Enablers: intervention design factors, health system factor Barriers: community factors
Yasuoka 2012 [177]	Cambodia	Village Malaria Workers (VMWs)	Malaria Referral, prevention, case detection, education	To assess if expansion of activities of VMWs interferes with the quality of service of their original tasks in malaria control	Quantitative	B	Enabler: intervention design factor
Yeboah-Antwi 2010 [147]	Zambia	CHWs	Child care Curative, referral regarding malaria and pneumonia	To assess the effectiveness and feasibility of using CHWs to manage pneumonia and malaria in children with the aid of Rapid Diagnostic Tests (RDTs) per protocol	Cluster RCT	A	Enablers: intervention design factors Barrier: community factor

Ye-ebiyo 2007 [115]	Ethiopia	HEWs	Multiple	To make a clear needs assessment of continuing education and clearly map out and articulate priorities in and identify resources to undertake continuing education for HEWs	Qualitative	B	Barrier: community factor, health system factor
Yirga 2010 [100]	Ethiopia	Community Drug Distributors (CDDs)	Onchocerciasis Ivermectin distribution	To identify what factors are associated with Community Directed Treatment with Ivermectin (CDTI) compliance and what are the motivators and barriers of compliance with CDTI	Quantitative (case control study)	A	Enablers: intervention design factors Barriers: intervention design factors, community factors
Zachariah 2007 [183]	Malawi	Volunteers	HIV and AIDS Household visits, referral, drug distribution	To verify if community support influences ART outcomes among HIV positive individuals placed on antiretroviral treatment (ART) in a rural district in Malawi	Quantitative	B	Enablers: Intervention design factors Barriers: health system factors

ANNEX 5 Incentives

Incentive	CTC provider, country and source	Examples
Fixed salary (employees of government or NGO)	Health Surveillance Assistants (HSAs) in Malawi [178]; Lady Health Workers in Pakistan [243]; Behvarz (CHWs) in Iran [96, 201]; community antiretroviral therapy and tuberculosis treatment supporters (CATTs) in Uganda [129]; community facilitators on maternal health in Indonesia [185]; HEWs in Ethiopia [114]; Anganwadi workers in India [144]; CHWs in Malawi and Bangladesh [203].	In the 1960's, temporary staff, "smallpox vaccinators" were recruited and in the 1970s "cholera assistants" were mobilised. From this, the HSAs evolved and were officially part of the health system since 1995 [178].
Regular allowance	Community volunteers in Nigeria [81, 82]; CHWs in Malawi [83]; community home-based care workers [238] and lay counselors HIV [158], CHWs [105] and volunteers HIV South Africa [234]; peer health workers and volunteer CHWs working in MNCH in Uganda [118, 164, 193]; CHWs working in maternal health in Afghanistan [87]; CHWs in Uganda and Bangladesh [203]; CHWs [97] and HEWs in Ethiopia [114]; Community-based distributors in India [89]; HIV care facilitators in Zimbabwe [101]; lay counsellors [131] and adherence support workers in Zambia [151]; Lady Health Workers in Pakistan [122]; CHWs in Bangladesh [169]; CHWs in South Africa [122]; CHWs in Kenya [192].	<p>CHWs maternal health (misoprostol) in Afghanistan got a travel allowance of maximum 15 dollar per year [87].</p> <p>In Ethiopia, health extension workers receive per diems in addition to their salary, e.g. for participation in polio campaigns and de-worming and for attending meetings [114].</p> <p>Zimbabwean HIV care facilitators work four hours daily during three days per week, receiving an incentive of USD5-10 per month [101].</p> <p>1800 Pakistan rupees (USD30) and local travel costs are paid every month to Lady Health Workers [122].</p> <p>CHW in South Africa receive a relatively high monthly stipend of R1,000 (about USD100) and in exchange were expected 20 hours per week, although many said they were working longer hours and that payments were inconsistent and unreliable [105].</p>
Irregular allowance	CHWs in Bangladesh [82, 168]; auxiliary staff in Tanzania [103]; village health volunteers in Lao PDR [222]; TBAs in Gambia [104]; female Community Health Volunteers in Nepal [132]; community-based surveillance volunteers in Ghana [94].	<p>Per diems for attending workshop and meetings [82, 103, 104, 168, 222].</p> <p>In Ghana, community-based surveillance volunteers obtain one-off payments for participating in National Immunization Days and similar activities, as well as for attending meetings (e.g. USD1 for quarterly meetings) [94].</p>

Performance-based incentives	Shasthya Shebikas (CHWs) in Bangladesh [90, 166]; CHWs in Nepal and Bangladesh [203]; Accredited Social Health Activist (ASHA) in India [108, 119, 144]; TBAs in Pakistan [241]; lay counsellors in South Africa [158]; trained TBAs in Lesotho [152]; community facilitators for maternal health in Indonesia [185].	<p>Former TBAs trained as maternal health workers in Lesotho obtained performance based incentives for every ANC visit accompanied and every woman they brought to facility for delivery, as well as for attending trainings and submitting reports [152].</p> <p>In Indonesia, community facilitators for maternal health (promoting micronutrients among mothers) received a modest salary for their work, while a part was dependent on actual field activities, based on successful progress through certification [185].</p> <p>In India, cash incentives are paid to ASHAs for specific health outcomes and financial compensation for training days (at Rs.100 per day). If facilitating a birth in a health facility instead of at home brings the ASHS a reward of Rs. 600 while the woman gets Rs. 1,400. ASHAs furthermore get Rs. 150 for each child with a completed immunisation session and Rs. 150 for each client undergoing sterilisation. Others report that ASHAs receive, in addition to a stipend, incentives of between 5 to 600 rupees for various activities such as registration birth and death (Rp. 5), sterilization clients (Rp. 250) and ensuring complete of leprosy treatment (Rp. 500) [119].</p>
Non-monetary, material incentives	Agente Comunitário de Saúde (ACS) and CHWs in Mozambique [97, 123]; CHWs in Zambia [147]; HIV volunteers in South Africa [234]; Shasthya Shebikas in Bangladesh [168]; CHWs in Kenya [98]; HIV volunteers in Malawi [183]; community-based reproductive health workers [198]. peer health workers [164, 193], community volunteer workers [187],volunteer CHWs [118] and CATTs (expert HIV patients) in Uganda [129]; village health workers in Lao PDR [222].	<p>CHWs in Mozambique and Zambia and peer health workers in Uganda received bicycles [123, 147, 164, 193].</p> <p>HIV volunteers in South Africa, Shasthya Shebikas in Bangladesh, peer health workers in Uganda and community volunteer workers in Uganda got uniforms/dressing [164, 168, 187, 193, 234].</p> <p>In Uganda, volunteer CHWs working in MNCH got, besides a stipend for transport, t-shirts, exchange visits, inter-village competitions, annual holiday gift and income generating activities [118].</p> <p>CATTs (expert HIV patients) in Uganda not only receive a monthly salary but also other incentives including: school fees support for their children, free care and treatment, nutrition support, raincoats, bicycles, umbrellas, interest-free loans and the opportunity to participate in income generating activities [129].</p> <p>In Lao PDR, village health workers are rewarded with free health services (exemption of medical expenses) [222].</p> <p>In Kenya, CHW received 'preferential services' for themselves in health facilities [98].</p>

Community (material) incentives	CHWs in Afghanistan [80]; TBAs in the Gambia [104].	TBAs in the Gambia receive monetary gifts and material donations during the naming ceremony of the babies they delivered. (Many TBAs agreed that rates enormously varied because of the rampant levels of household inequalities in the villages) [104].
Income from selling services (fees)	Malaria control assistants in Sudan [117]; TBAs in Zambia [208]; TBAs in India [159]; TBAs in Mozambique [123].	<p>Malaria control assistants in Sudan (doing diagnosis and treatment of malaria) charged a consultation fee of 1 Sudanese Dollar (USD0.5) [117].</p> <p>In Zambia, India and Mozambique, TBAs obtain fees based on negotiation with clients [123, 159, 208]. In Mozambique, some TBAs were seen as overstepping their boundaries by systematically charging for assisted deliveries [123].</p>
Income from selling commodities	APEs (CHWs) in Mozambique [123]; Shasthya Shebikas (CHWs) in Bangladesh [102, 166, 168]; women group leaders in Burkina Faso [67]; community-based distributors for FP in Madagascar [170]; CHWs in Mali [176].	<p>Shasthya Shebikas (CHWs) in Bangladesh generate an income by selling health-related commodities and drugs in their communities. They usually sell basic curative medicines and health products, such as, oral saline, iodized salt, hygienic soap, sanitary napkins, delivery kits, oral contraceptives and condoms [166].</p> <p>Community-based distributors for FP in Madagascar were also not paid a salary, but were allowed to sell contraceptives at a small profit margin [170].</p> <p>In Mali, CHW are volunteers, but charge for medicines to cover drug kits and additional operational costs. CHW and village oversight committees split revenues from additional drug sales between them as incentive [176].</p>
Immaterial incentives: measures to increase recognition	CHWs in Kenya [98, 192]; volunteers at drug distribution centres in India [138]; Behvarz (CHWs) in Iran [96]; peer counsellors HIV in Uganda and Ethiopia [125]; matrons in Mali [88]; CHWs in Ethiopia and Mozambique [97]; CHWs in Ethiopia [91]; TBAs in the Gambia [104]; store managers in Malawi [150]; female community health volunteers in Nepal [132]; community medicine distributors in Uganda [113]; MNCH CHWs in Mali [142]; Manzaneras (CHWs) in Bolivia [109]; TBAs in India [159];	<p>CHWs in Kenya, volunteers at drug distribution centres in India, Behvarz (CHWs) in Iran, matrons in Mali and female community health volunteers in Nepal reported community recognition and associated status as an incentive [88, 96, 98, 138, 192].</p> <p>Behvarz (CHWs) in Iran reported recognition by health staff and managers as an incentive [96].</p> <p>Peer counsellors HIV in Uganda and Ethiopia reported to be motivated by the fact they could help other HIV infected people. Motivation was negatively influenced by frustration about long waiting hours at the facility for patients and the narrow geographical scope of the outreach services [125].</p> <p>A study in Ethiopia and Mozambique found CTC provider job satisfaction to be based the good feeling derived from helping people and this was also related to spiritual values. Commitment to CHW role existed as they derived wellbeing from caring and the relationship with clients. Positive client feedback was a motivation to remain a CHW, even if there were few other incentives and CHWs had to rely on other jobs or depend on family support [97].</p>

		<p>In Ethiopia, community festivals are held as health days or CHWs days and certificates and group photos are made and posted in health posts, schools and training centers [91].</p> <p>For TBAs in the Gambia, the greatest social reward many TBAs appreciated and spoke about proudly was the recognition given during community naming ceremonies. They reported that these ceremonies gave them status within the community and brought them respect as elders [104].</p> <p>In one case in Malawi, storekeepers considered the business management training they received on sales, record keeping and product marketing (training other than the minimum required to do the work) an important incentive for their role as CTC provider [150].</p>
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