Co-design, implementation, and evaluation of a 'Learning from Excellence' Intervention for Community Health Workers in Neno District, Malawi.

By

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DECLARATION

This thesis is submitted to the University of Warwick in support of my application for the degree of Doctor of Philosophy. It has been composed by me and has not been submitted in any previous application for any degree.

Parts of this thesis have been published by the author:

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ABSTRACT

Background: Community Health Workers (CHWs) provide promotional, preventive, and curative care and link communities to health services. CHW programmes are often hampered by varying performance and poor motivation when brought to scale. Amongst others, CHW motivation could be affected by incentives. This research focuses on a non-financial incentive, Learning from Excellence (LfE), for CHWs in Neno District, Malawi.

Aim: To co-design, implement, and subsequently evaluate a LfE intervention for CHWs, together with CHWs and other stakeholders in Neno District, Malawi.

Methods: Four studies were performed: 1) a systematic review aimed at developing a logic model explaining how interventions like LfE can impact health workers in any setting, 2) a qualitative observational study, aimed at refining the developed logic model to incorporate specific contexts, mechanisms, and outcomes for CHWs in Neno District 3) the co-design, implementation, and roll-out of the LfE intervention, and 4) a mixed method evaluation aimed at examining and explaining the observed impact of LfE on CHWs in Neno District.

Results: A logic model, containing various contextual factors, mechanisms, and outcomes of interventions like LfE was developed in the systematic review. In the observational study, this logic model was adapted based on identified contexts, mechanisms, and outcomes in Neno District. The LfE intervention was subsequently co-designed with stakeholders, piloted to obtain feedback from CHWs, and rolled out in August 2020. In the first three months 555 reports were submitted by CHWs. After the mixed method evaluation, the logic model was adapted to explain the underlying mechanisms leading to impact of LfE on CHWs in Neno District, Malawi.

Conclusion: Various barriers and enablers for the uptake and impact of the LfE intervention were identified and integrated into a logic model, which can be used by those who are interested in designing and/or implementing an LfE intervention for health workers.

ABBREVIATION

AEHO	=	Assistant Environmental Health Officer
AI	=	Appreciative Inquiry
AIDS	=	Acquired Immunodeficiency Syndrome
ANC	=	Antenatal Care
APZU	=	Abwenzi pa za Umoyo
ART	=	Antiretroviral Therapy
BMI	=	Body Mass Index
BSREC	=	Biomedical & Scientific Research Ethics Committee
CBPR	=	Community-Based Participatory Research
CCC	=	Chronic Care Clinic
CHAM	=	Christian Health Association Malawi
CHD	=	Community Health Director
CHO	=	Community Health Officer
CHSA	=	Chief Health System's Advisor
CHW	=	Community Health Worker
CMO	=	Chief Medical Officer
CMOC	=	Context-Mechanism-Outcome configuration
DEC	=	District Executive Committee
DEHO	=	District Environmental Health Officer
DHO	=	District Health Office
DHOf	=	District Health Officer
ED	=	Emergency Department
GDP	=	Gross Domestic Product
GHC	=	Global Health Corps

HDI	=	Human Development Index
HIV	=	Human Immunodeficiency Virus
HSA	=	Health Surveillance Assistant
IC3	=	Integrated Chronic Care Clinic
ICU	=	Intensive Care Unit
IHI	=	Institute for Healthcare Improvement
IM	=	Interpolated Median
IT	=	Information Technology
LfE	=	Learning from Excellence
LHW	=	Lay Health Worker
LMIC	=	Low-and Middle-Income Countries
LPN	=	Licenced Practical Nurse
M	=	Mean
MDG	=	Millennium Development Goals
M&E	=	Monitoring and Evaluation
MOH	=	Ministry of Health
MPI	=	Multidimensional Poverty Index
MUAC	=	Mid-Upper Arm Circumference
MWK	=	Malawian Kwacha
NA	=	Not Applicable
NCD	=	Non-Communicable Disease
NGO	=	Non-Governmental Organisation
NHS	=	National Health Service
NHSRC	=	National Health Science Research Committee

PD	=	Participatory Design
PHC	=	Primary Health Care
PIH	=	Partners in Health
PIH RA	=	PIH-employed Research Assistant
PNC	=	Postnatal Care
POS	=	Positive Organisational Scholarship
POSER	=	Programme on Social and Economic Rights
PP	=	Positive Psychology
QI	=	Quality Improvement
Qual	=	Qualitative
Quant	=	Quantitative
RN	=	Registered Nurse
RR	=	Relative Risk
SCHW	=	Senior Community Health Worker
SD	=	Standard Deviation
SDG	=	Sustainable Development Goals
SHARC	=	Screening for Health and Referral in the Community
SHARF	=	Screening for Health and Referral in the Facility
SPANE	=	Scale of Positive and Negative Experience
TB	=	Tuberculosis
UK	=	United Kingdom
USA	=	United States of America
USD	=	United States Dollar
VIG	=	Video Interaction Guidance

WHO	=	World Health Organization

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THESIS OVERVIEW

This thesis consists of ten chapters, divided into five parts. Part 1 includes the background, consisting of three chapters. In Chapter 1, I will present an overview of the literature regarding Community Health Workers (CHWs), their roles, and outcomes of CHW programmes, including facilitators and barriers to achieving these outcomes. Factors that potentially impact motivation and performance of CHWs will also be discussed. Chapter 2 provides an overview of the setting of this thesis, Neno, a district in southern Malawi, and in Chapter 3 I will introduce the research paradigm I used in this study.

In Part 2 the theoretical underpinning of how Learning from Excellence (LfE) could impact CHWs will be provided. In Chapter 4, a systematic review aimed at identifying how interventions like LfE can impact organisational performance in healthcare settings will be presented. This review was published in Human Resources for Health in January 2021. In Chapter 5 the observational study, aimed at linking the theory developed in Chapter 4 to the context of Neno District, is presented.

Part 3 will consist of the co-design and implementation aspects of this study. Chapter 6 presents an overview of the co-design activities, including stakeholders who participated and the resultant outcomes of the activities. Chapter 7 subsequently explains the implementation process of the co-designed LfE intervention.

Part 4 regards the outcomes of the LfE intervention in Neno District. In Chapter 8 an overview of the evaluated and submitted LfE forms is provided, while Chapter 9 describes an in-depth mixed method evaluation study, aimed at identifying if and how impact of the LfE intervention was achieved. In this chapter the logic model that was developed in Chapter 5 will be fine-tuned.

Finally, Part 5, Chapter 10, will discuss the results and recommendations for future research will be made before the overall conclusion is presented.

CHAPTER 1: INTRODUCTION

In this chapter I will present the problem statement of this thesis. I will present some background about Community Health Workers (CHWs), their roles, the impact of CHW programmes in various settings and potential facilitators and barriers for impact. I will also present background information about CHW motivation and performance, and their impact on outcomes of CHW programmes. I will subsequently introduce positive psychology (PP) and explain how interventions based on PP could potentially impact CHW motivation and performance, and thus mitigate barriers to impact of CHW programmes. Finally, the aims and objectives of this thesis will be presented.

1.1 Problem Statement

Health systems worldwide face increased demand for care due to aging populations and growing prevalence of chronic diseases, alongside needing to deliver acute and preventive care (1). On the supply-side, a lack of human resources (2) contributes to understaffed healthcare organisations.

Heavy workloads, job insecurity and concerns over personal safety (potentially created by a lack of physical resources such as PPE) (3) are job demands, the physical, social or organisational aspects of the job that require sustained physical or mental effort (4). Increased job demands lead to mental health problems, including anxiety, depression, insomnia and burnout, a condition of emotional exhaustion, depersonalization, and a sense of low accomplishment (5-8). The negative effects of job demands can be mitigated by job resources, such as workplace social support, performance feedback, job control and personal growth and development, leading to increased well-being and decreased burnout (4, 9-12).

Job resources could potentially be improved with interventions based on PP. These interventions aim to drive change by building on positive qualities and strengths of healthcare personnel.

In this thesis I will focus on one specific cadre of health personnel: CHWs.

CHWs play an important role in linking communities to healthcare by providing promotional, preventive and sometimes (limited) curative services (13). However, CHW performance varies widely and CHW programmes have often been hampered by poor motivation and performance when brought to scale (14). Interventions based on PP,

focusing on strengths of people, could potentially increase CHW motivation and performance, as identified in an exploratory study regarding the impact of one such intervention, Learning from Excellence (LfE), on health professionals in the United Kingdom (UK) (15). However, the impact of interventions like LfE on CHWs, is unknown.

1.2 Background

1.2.1 Community Health Workers

CHWs are 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"* (13). However, as CHW roles vary widely, from more specific to very general, it is difficult to explain the full scope of this cadre of health workers in one definition (16).

CHWs are known by a wide variety of names: promotoras, lay health workers (LHWs) or lay health advisers and frontline workers, amongst others. As mentioned above, CHWs' central role is to support access to care for community members, while providing health and demographic surveillance. Additionally, CHWs play an important role in addressing economic, social, environmental and political rights of individuals and communities (13). For example, in an article by Farmer et al. CHWs are presented as advocates for patients' health, not only in connecting the patient to care, but also through demonstrating how health issues, including those resulting from social, economic, cultural or political exclusions, impact life conditions of the community (17). CHWs are in a position to communicate realities of the community to outsiders, and influence public health policy (13).

CHWs are commonly based within communities, often in underserved areas, in both high-income and low-income settings, where they act as a link between the communities and the health system. (13, 18). As the CHW definition provided in the first sentence of this sub-section suggests, CHWs usually don't have a formal professional degree and they are commonly trained by the organisation they work for, so they are able to perform their assigned tasks (16).

Broadly speaking, three different groups of CHWs can be identified: LHWs, who have received only a few days or weeks of training, level 1 paraprofessionals, who have some form of secondary education and subsequent informal training, and level 2 paraprofessionals with secondary education and more formal training, lasting a few months to

more than a year (16). Training varies widely in terms of length and depth. While in some places CHWs receive an initial ten-day training, and a yearly ten-day refresher course, in others they are trained for three to six months, with refresher courses provided twice a year (19).

The exact job requirements and role of CHWs vary, but a distinction can be made between generalist and specialist CHWs. Whereas the former regards CHWs who perform a large range of functions, including home visits, health education and first aid, the latter regards CHWs who are specialised in one key area of care, like HIV/AIDS or maternal and child health (19). In a systematic review of reviews, Scott et al. clustered the roles of CHWs in the following six categories (20):

1. CHWs deliver diagnostic, treatment and other clinical services. They identify community members in need of healthcare, or monitor clinical symptoms (21). CHWs provide care and treatment, and vaccinate children (22), or assist in at-home deliveries (23).
2. CHWs assist with appropriate utilisation of health services and refer community members. For example, they help pregnant women by promoting antenatal care (24), and encourage adherence to HIV treatment (25).
3. CHWs provide health education and behaviour change motivation to community members, including assistance with family planning methods (26), and education about HIV (27).
4. CHWs collect and record data, sometimes with the help of mobile health (mHealth) tools (28).
5. CHWs improve relationships between health services and communities by, for example, advocating on behalf of patients (29).
6. CHWs provide psychosocial support for various patient populations, including, but not limited to, people living with HIV (27).

CHWs are involved in a wide variety of health priorities including, but not limited to (13): reduction of undernutrition, reduction of mortality in children under 5 years of age, community management of serious childhood illness, reduction of neonatal mortality, improvement of women's health, halting and reversing the spread of HIV/AIDS,

and universal access to HIV/AIDS treatment, malaria control, Tuberculosis (TB) control, hypertension control, reduction of cardiovascular risk factors, diabetes control and cancer screening (13).

In many parts of the world CHWs have been around for a long time and the origins of CHWs can be traced back to seventeenth century Russia where CHWs, referred to as *feldshers*, were trained to provide basic medical care to military personnel in the absence of trained medical doctors (30). CHWs as we currently know them emerged in the twentieth century when new discoveries regarding causes of disease began to translate into public health interventions, like the provision of clean water. Prevention of disease became important and due to a lack of trained medical personnel; local communities became involved in providing public health interventions. An example of a 1920 CHW model comes from China, where mostly illiterate community members received three months of training to perform activities like recording of births and deaths, vaccinating community members against smallpox, and providing basic medical care (31). Over time their role evolved, and as their duties came to include assistance during childbirth and setting and treatment of broken bones, they became known as 'barefoot doctors' (32). In the 1960s the failure to address the needs of the rural population in many countries, led to the adoption of the 'barefoot doctor' model in an attempt to improve access to healthcare for those in need (33). To improve access to healthcare for the poor, 'barefoot doctor' programmes were implemented in countries like Honduras, India, Indonesia, Tanzania and Venezuela (33).

Due to CHWs' role as intermediaries between the communities and health system, they became an important feature of Primary Health Care (PHC) (34), which was presented as *the* way to achieve health for all in the 1978 Alma Ata Declaration. The declaration expressed the need for urgent action to protect and promote the health of all people, and mentioned an important potential role for CHWs in achieving health for all as they *"... respond to the expressed health needs of the community"* (35).

While CHW programmes gathered increased attention after the Alma Ata declaration, various issues affected CHW programmes in the 1980s, partly due to the economic recession, causing new economic stringencies in many developing countries. Economic problems led to the collapse of large-scale CHW programmes (19), due to lack of resources, training, supervision and remuneration or incentives, as well as inappropriate

selection of CHWs, poor integration of CHWs with health systems and lack of acceptance by higher-level care providers (36). This led to poor quality of care provided by CHW programmes, as shown in several reviews of CHW programmes published in the late 1980s and early 1990s (34). There was a lack of evidence about the effectiveness of CHW programmes and many realised that while CHWs don't have to be professionally trained, CHW programmes still require significant financial and supervisory inputs, which eventually led to the phasing out of these programmes (36).

Since the early 2000s, there has been renewed interest in CHWs; for example, between 2005 (n=13) and 2014 (n=156) the number of academic publications related to CHWs increased nearly sevenfold (37). Several large-scale CHW programmes were implemented in this period including in Ethiopia (Health Extension Workers), Pakistan (Lady Health Workers) and India (Accredited Social Health Activists) (38). Renewed interested in CHWs was mainly due to continuous shortage of human resources for health (13). Health workforce shortages were estimated to be about 17.4 million in 2013, of which more than 9 million were nurses and midwives and 2.6 million were medical doctors. Largest needs-based shortages of health workers were estimated in South-East Asia, with a shortage of 6.9 million, and Africa, with a shortage of 4.2 million (39). To alleviate these human resource pressures, the World Health Organization (WHO) promoted task shifting from higher skilled workers to lower skilled workers, e.g. from medically trained professionals to CHWs, which led to a further renewal of interest CHWs (40). Through task-shifting, non-specialised tasks, including health education and some screening tasks, are taken away from the medically trained workforce and given to CHWs, freeing up the time of medical professionals (41). For example, the WHO indicated that more than a third of the identified tasks essential for prevention of HIV transmission could be performed by CHWs (40).

CHWs were also expected to be able to help countries in reaching the Millennium Development Goals (MDGs), as well as the later Sustainable Development Goals (SDGs) (37, 42, 43). For the MDGs, CHWs were expected to play an important role in goals related to child-survival, due to the focus on community-based activities related to these goals (37).

1.2.2 Covid-19 and CHWs

During the COVID-19 pandemic, healthcare personnel worldwide, including CHWs faced enormous pressure due to heavy workloads and staff shortages, insufficient personal protective equipment (PPE) and high risk of infection (6).

Daily functions of frontline healthcare workers, including those of CHWs changed during the COVID-19 pandemic, forcing them to adapt. While limited published information is available regarding the roles of CHWs during the COVID-19 pandemic, in one programme in Brazil CHWs were expected to adapt without coordination from management, which presented a major challenge (44). Particularly physical distancing was difficult for many CHWs as their everyday roles depend on close interaction with community members. A lack of coordinated response to COVID-19 led to CHWs and municipalities responding in their own, different ways, according to their capacities (44).

CHWs have played an important role in various settings in educating communities about COVID-19 and COVID-19 symptoms, as well as in identifying disease. In Thailand for example, existing village health workers were trained to recognise COVID-19 symptoms (45). They were provided with personal protective equipment and educated community members about the disease and preventive measures as well as symptoms. They identified and monitored community members returning from high-risk areas like Bangkok, or abroad, as well as members from the community who were identified as high risk because they showed symptoms. A list of those who were monitored and symptomatic was reported to sub-district health officials (45).

Another study performed in Brazil highlighted the importance of training CHWs about COVID-19 and social distancing measures, as those who received training were more secure in continuing to perform work activities compared to those who did not receive training (46).

1.2.3 Outcomes of CHW programmes

Below I will describe findings of three systematic reviews that have been conducted to investigate the effectiveness of CHW programmes.

Lewin et al. conducted a large systematic review, published in 2005, comparing outcomes of LHW programmes (47). The systematic review included 55 studies undertaken in high-income countries, 14 studies undertaken in middle-income countries, as

well as 15 studies undertaken in low-income countries. The systematic review showed that LHWs can increase the proportion of children with immunisation (Relative Risk (RR)=1.23, 95% CI 1.09 to 1.38, p=0.0006), but results were heterogeneous and of moderate quality. Promotion of breast feeding by LHWs showed a small impact on breastfeeding initiation (RR=1.36, 95% CI 1.14 to 1.61, p<0.00001), but there was some unexplained heterogeneity. There was moderate quality evidence that LHW interventions had a positive effect on breastfeeding up to six months postpartum (RR=1.24, 95% CI 1.10 to 1.39, p=0.0004), and moderate quality evidence showed CHWs had a small impact on cure rates for TB-patients (RR=1.22, 95% CI 1.13 to 1.31). However, compared to usual care, no effect of LHWs was found on child mortality (RR=0.77, 95% CI 0.55 to 1.03, p=0.07) or neonatal mortality (RR=0.76, 95% CI 0.57 to 1.02, p=0.07), and quality of evidence was low. The available evidence for this review suggested LHWs were probably unable to increase likelihood of seeking care (RR=1.33, 95% CI 0.86 to 2.05) (47).

A 2010 systematic review of 53 studies identified the impact of CHWs on knowledge, behaviour, health outcomes and health care utilisation of community members (48). Included studies suggested that CHW programmes can improve participant knowledge, compared to non-CHW approaches. Only one study included patient satisfaction and they found no difference between CHWs and other intervention arms, whereas health outcomes seemed to improve with the help of CHW programmes, as compared to other study arms. Findings were not consistent though, and evidence was of low quality (48).

A 2013 systematic review of 19 studies identified effectiveness of preventive interventions delivered by CHWs for maternal and child health in low- and middle-income countries (LMIC) (49). CHWs were found to be effective in delivering intermittent preventive treatment medication to targeted households and positively influenced malaria prevention by encouraging people to sleep under insecticide treated nets. Health education interventions showed effectiveness as well, as CHWs promoted messages on food safety and immunisations, which was associated with decrease in diarrhoea, malaria, underweight prevalence, and under-5 mortality. CHWs were also effective in improving breastfeeding practices, as well as in increasing health seeking behaviours for new-borns by educating mothers. Included studies were of moderate quality and publication bias was likely (49).

In terms of individual studies, below is a very small selection of studies, providing a short overview of the wide variety of outcomes of CHWs programmes in various countries. In Bangladesh, Haiti and Vietnam for example, CHWs promoted exclusive breastfeeding and supported malnourished children in the community, which helped to improve childhood nutrition (50). In The Gambia, CHWs provided insecticide-treated bed-nets and health education to community members, which reduced mortality among children aged 1-4 years old by 63% (51). In the same CHW programme, anti-malarial chemoprophylaxis was given to children aged 1-4 years old, which helped to reduce mortality by 36%, and the prevalence of children with fever and parasitaemia by 84% (51). In Tamil Nadu, India, a CHW programme led to reduction in maternal mortality from 380 deaths in 1993 to 90 deaths in 2007, with deliveries in health facilities up from 20% in 1971 to 98% in 2007 (52). In India registration for antenatal care (ANC) was compared between trained CHWs and untrained birth assistants, and among women attended by trained CHWs, ANC registration was 39%, compared to 6% among those attended by services of untrained birth assistants. Additionally, 13% of women attended by trained birth assistants attended postnatal care (PNC) services, compared to 8% of women attended by untrained birth assistants (53). In a programme in Iran, CHWs provided family planning services, and 28% of women in the intervention group used contraceptives, compared to 15% of women in the control group, who had access to non-CHW family planning services (54). CHWs furthermore improved anti-retroviral treatment (ART) adherence in studies in Haiti, Uganda and South Africa (55)

The sustainability and success of CHW programmes depend on ongoing commitment of resources, including investment in quality training, supervision, monitoring and organisational support (56).

1.2.4 Performance of CHWs

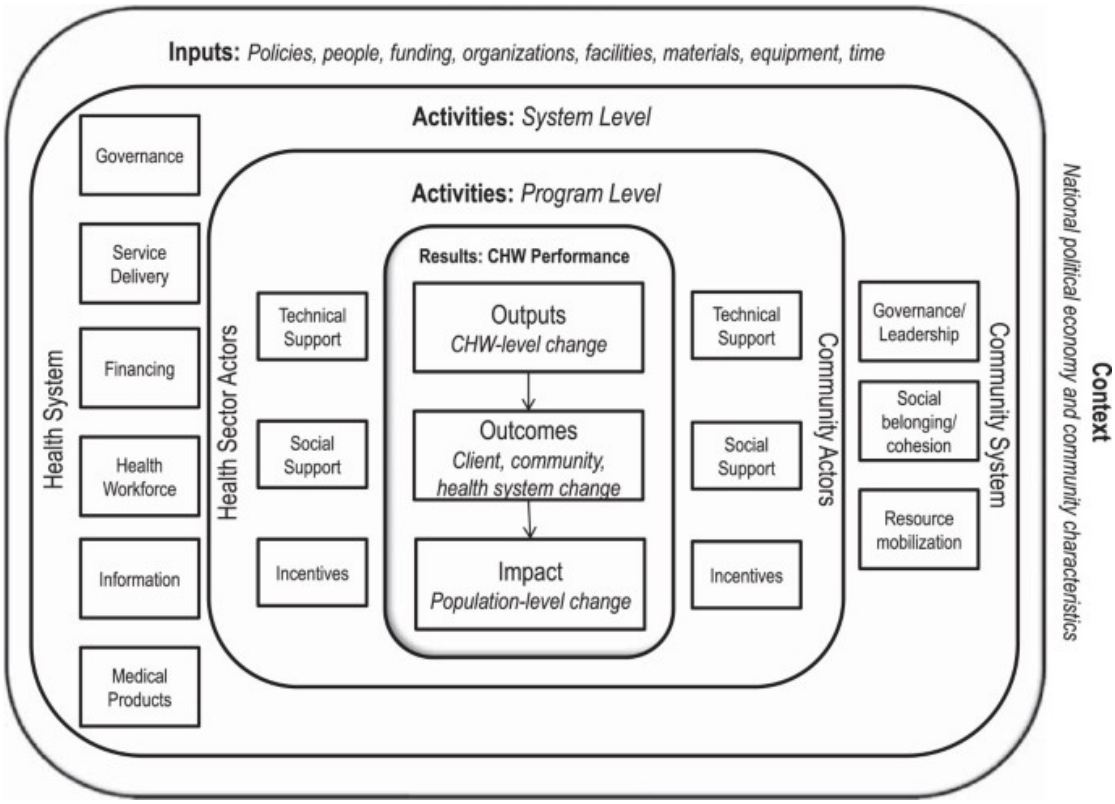
As shown in the paragraph above, CHW programmes demonstrated positive outcomes, and improved the health of community members. However, the programmes are often hampered by poor motivation, high workloads and varying quality when brought to scale (57-63).

To maintain good quality CHW programmes it is important to initiate and maintain high CHW performance. CHW performance could be defined by outcomes of CHW programmes, and Ballard et al. defined performance as follows: biological and behav-

ioural outcomes for patients, as well as the use of health services, quality of care provided and CHW retention (64). Another study identified the following five interlinked elements as making up CHW performance: individual performance, use of services, retention/attrition, impact effectiveness and cost-effectiveness (19).

Several studies have identified factors that impact CHW performance. An overview of factors impacting the performance of CHWs, as developed by Naimoli et al., is presented in figure 1 (65). As figure 1 shows, a multitude of factors impact performance of CHWs, and performance could thus be measured in various ways. For example, performance could be measured in terms of client-related outcomes, as mentioned above, but also as different CHW attributes like self-esteem, competencies, job satisfaction and guideline adherence (65).

Figure 1 A generic overview of factors impacting community health worker performance, as developed by Naimoli et al (53).



At the input level, CHWs' demographic factors, such as being married and their level of education, could affect CHW capability, which can subsequently affect their performance (66). Performance is also influenced by the availability of resources, including human resources, medicines, and transport availability, as these impact CHWs' ability

to treat patients (66, 67). Furthermore, low CHW retention rates and excessive CHW workloads can negatively impact CHW performance (57).

The characteristics of the wider health system in which CHWs operate affects performance, with better performance when links between different components and levels of the health system are strong (68). Robust performing health systems can reinforce CHW programming and indirectly impact CHW performance by providing good governance, adequate financing, well-organised service delivery and a well-trained and well-deployed health workforce (65). In terms of the wider health system, the quality of leadership at national and district levels impacts the monitoring and evaluation, with the help of appropriate tools and registers, and thus knowledge of CHW performance (69). For individual CHWs, support from trained healthcare professionals, and their trust in CHWs is important (66). Trust is impacted by feelings of (dis)connectedness, (un)familiarity, fairness, competence, self-fulfilment, and respect and recognition from community members and trained health professionals for the work done by CHWs (70). If there is a trusting relationship, between CHWs, the community and the health sector, CHW motivation improves, which in turn will enhance their performance (70). Trusting relationships help build capacity and communication, and lack of trust or consistent management support, as well as unclear roles, create a disconnect, which harms CHW performance (71).

Another important factor related to the wider health system, which impacts CHW performance, as well as CHW motivation, is regular supervision (42, 72). Supervisors can help secure a place for CHWs in the health system, allowing them to better fulfil their role as well as increase engagement with trained staff (73). CHWs often work alone, and regular supervision creates opportunities for interaction, feedback, and clarification. Supervision could also lead to increased recognition, which positively affects relationships (58). Supervision creates a link between the CHWs and the health system (72). A systematic review looking at the impact of supportive supervision identified that supportive supervision could improve quality of care, as well as job satisfaction, compared to traditional supervision, or no supervision at all (74). Supportive supervision seems to help create a relationship between supervisor and supervisee, creating a feeling of trust and team spirit, which leads to increased confidence, improved morale, and motivation, as well as increased knowledge and skills (74). Another study, per-

formed by Chinbuah et al, showed that when supervisors were trained to provide additional support to CHWs and visited them fortnightly, CHW performance was better, compared to performance of CHWs who were visited less, and did not receive additional support (75). A very recent study showed that supportive supervision, including written feedback and regular supervisor contact could improve performance of CHWs working in a programme regarding community management of childhood diarrhoea and pneumonia in Pakistan (76).

CHWs act as a link between communities and the health system, which means transactional social processes, like the relationships between CHWs and community members, among CHWs themselves as well as those between CHWs and trained health professionals, impact performance in various ways (70). For example, CHW performance can be impacted by (perceived) support from community members. CHWs serve large populations, perform many tasks, and are often overwhelmed, and being appreciated by the beneficiaries of their work improves performance (57, 77).

Performance of CHWs can be impacted by various interventions. A realist synthesis of randomised control trials involving the use of CHWs for delivering child health interventions in LMICs identified various mechanisms explaining how different interventions can target CHW performance (78). For example, for training interventions, mechanisms included the sense of self efficacy, increase in self-esteem, and assurance there is a system for back-up support. In comparison, for health system-related interventions for CHW performance in the context of programmes targeting the poor with an unmet need, the following mechanisms were identified: a sense of relatedness with local public health services, sense of credibility and legitimacy of being part of the health service, anticipation of being valued by local public health services and the community, and the perception of improvement in social status. For interventions involving a better position of CHWs in their communities mechanisms included: anticipation of being valued by the community, perception of improvement in social status and having a valuable social role, and a sense of relatedness with and accountability to the beneficiaries of their work (78).

Performance is also impacted by motivation of CHWs, which in turn can be impacted by various factors, as will be described in further detail below.

1.2.5 CHW motivation

Motivation of CHWs is an important facilitator for performance, as motivation ensures health workers come to work, are diligent in their work and are flexible and willing to perform the assigned tasks. In the work context motivation is defined as "*an individual's degree of willingness to exert and maintain an effort towards organizational goals"* (79).

A variety of disciplines have studied work motivation, including economics, psychology, organisational development, human resource management and sociology. Motivational processes operate at the level of the individual and depend on the extent to which workers adopt their organisational goals, and the extent to which they are able to mobilise personal resources to achieve joint goals (79).

Worker motivation can be impacted at the individual level, through expectations, experience of outcomes and individual goals; at the organisational level, through organisational structures, resources, processes as well as organisational feedback about performance; and at the community level, which influences worker motivation though expectations of services by community members (79). Before I provide more detail about specific factors that impact CHW motivation, it is important to distinguish between hygiene factors and motivating factors. The former are those factors that determine levels of worker dissatisfaction by their presence or absence, examples include supervision, interpersonal relations and work conditions (79). These factors are also called extrinsic motivational factors. Motivating factors, on the other hand determine the level of worker motivation and satisfaction. In this case, examples are achievement, recognition, advancement and growth and they are intrinsic (79). For example, a qualitative study performed in Tanzania identified intrinsic and extrinsic motivation factors at four levels: 1) the individual level, including dedication to public service, desire for knowledge to help self and family, desire to educate the community, 2) the family level, including moral support from the family, monetary, material and work-related support from family members, 3) the community level, including recognition and encouragement as well as monetary, material and work-related support and 4) the organisational level, including monetary support and future employment, tools, training and supervision (80).

Many CHWs work as volunteers, sometimes for small stipends (including those participating in this study, as explained in Chapter 2). Reasons for taking up a role as CHW,

include the following: autonomy (81), values of CHW and their altruistic and humanitarian concerns for community members (81-86), CHWs' eagerness to fill the gap in healthcare in their communities, as well as their passion for work. CHWs are motivated by the quality of services provided in health facilities when they refer patients (81). Some CHWs are motivated by the career prospects a role as CHW provides (81-83, 85). The role of CHW keeps them busy, allows them to develop new skills and use skills obtained while caring for family members for the greater good of the community (82, 86). In one study CHWs hoped their volunteering would attract good things to themselves, and acted as fulfilment of their religious obligation to help others (82).

Several broad factors for CHW motivation, once they are working as a CHW, have also been identified. For example, CHWs are motivated as their roles give them a sense of autonomy and self-empowerment. They can support their community and contribute to change, which was mentioned as reason to take up the role of CHW as well. Working as a CHW gets them out of the house and helps them acquire a heightened level of community standing and social recognition (87). Similar factors were identified in a study looking at motivation among close-to-community providers, including CHWs, conducted in six countries, including Malawi, the setting of my research. Identified factors included: organisational commitment, extrinsic job satisfaction, including remuneration and appreciation, community commitment, intrinsic job satisfaction and work conscientiousness, e.g., the desire to help those in need (88). Intrinsic motivational factors include love of voluntary work and the perception that a CHW is the key link between the community and the health facility (89). Community appreciation is particularly highly valued by CHWs (90).

A study in Vietnam showed that appreciation and support by managers and respect of people for their work were the two main motivating factors for CHWs (91). Motivation could additionally be impacted by supportive supervision and recognition for CHWs as this provides a sense of belonging and connectedness (67, 84, 92). Apart from feeling appreciated and receiving recognition, being given a salary, receiving training, and to be held responsible, were motivating factors for CHWs in Mali (93). Furthermore, relationships and interactions with higher-level district or NGO staff are important for CHWs (85, 92), as has also been described in section 1.2.4. Community ownership of the CHW programmes is also considered an important factor for motivation as well as retention of CHWs (60, 94).

A 2008 systematic review regarding motivational factors for health personnel identified the following more specific motivating factors (95), which were corroborated by another systematic review performed in 2013 (60):

1. Financial factors, including a salary or allowance. Almost all studies included in the systematic review discussed the importance of financial factors. Studies also noted that these incentives should be integrated with other incentives. The absence of sufficient financial factors is demotivating.
2. Career development factors, including the possibility to be promoted.
3. Educational factors, including the opportunity to take classes. Education opportunities have strong motivational effects as they allow workers to take on more demanding duties, achieve their personal goals and allow them to cope better with job requirements.
4. Hospital infrastructural factors, e.g., the work environment.
5. Resources, which refers to availability of essential equipment to perform the job (86).
6. Hospital management, and the relationships with them. Particularly inadequate management was identified as a demotivating factor for health workers.
7. Personal recognition or appreciation by managers, colleagues as well as patients and/or community members.

Below I will describe the impact of various incentives on CHW motivation. CHW motivation is dependent on various incentives at the individual, community, and health system levels. However, as the roles and tasks of CHWs vary widely across programmes, as do community contextual factors, the type of incentives needed to motivate CHWs is dependent on the local context of the CHW programme (96).

CHW motivation could be increased by Information Technology (IT) supported interventions that facilitate easy communication, provide context-specific technical support, and engender a sense of connectedness to the health system, supervisors and colleagues and are feasible and acceptable for CHWs (67).

Monetary compensation is valued highly by CHWs and allows them to dedicate themselves to the job, regardless of whether or not they are volunteering (60, 85, 89, 94, 96). However, financial incentives alone are insufficient for health worker motivation (79).

In a study conducted in Tanzania, voluntary CHWs preferred a combination of financial, in-kind, and non-financial incentives, including identification as CHW and being appreciated by staff at the clinic (97). In-kind incentives, including food or goods, as well as job enablers like training, bicycle and rain gear, also affected CHW motivation, as it allowed them to do their work, but also reinforced their standing as CHW in the community, as well as in the health system (60, 89). Other incentives can include feedback and refresher trainings, including certificates, which are valued and respected by community members, were also identified as motivating factors (87).

Non-financial incentives, like feelings of pride, or community appreciation, helped CHWs sustain the motivation to perform their assigned tasks (60, 89, 98). For example, in a study in Bangladesh most CHWs reported that non-financial incentives were more important for sustained motivation than financial compensation. CHWs were motivated intrinsically as they wanted to support community members and feel useful, and they loved their work. Incentives, when expectations were met, were thought to improve relationships between CHWs and their supervisors. The importance of non-financial incentives for health workers was also highlighted in a qualitative study of health workers in Kenya and Benin. Examples of non-financial incentives included team building, supportive supervision and feedback and continuing professional training. However, this study also acknowledged that non-financial incentives are not a silver bullet, and they cannot compensate for many other factors, including lack of resources or lack of financial incentives (99).

Contrary to incentives, disincentives can lead to decreased motivation. For example, when CHWs are promised a salary, but this isn't consistent, or when CHWs expect rewards, but these are not provided, CHWs become demotivated (60, 89, 96, 100). Other demotivating factors include inadequate refresher training, or when trained health personnel do not treat CHWs with respect, and when community members don't like the services provided by CHWs (60, 96).

Motivation can be maintained or improved with the help of interventions. A realist review of interventions for health workers in LMIC identified the following mechanisms, explaining how these interventions could impact motivation: awareness of local problems, empowerment to develop initiatives for change with health workers who subsequently see themselves as agents of change, assuring acceptance of new information on

diagnosis, treatment and care, creating a sense of belonging and respect, increased income, and providing opportunities to notice improvements in quality of care (101).

In summary, CHW motivation depends upon various factors. While financial incentives are an important driver for CHWs, these are insufficient without the presence of other motivating factors. In the rest of this thesis, I will look at a non-financial incentive called LfE. This incentive is aimed at recognising and appreciating CHWs for their work, which could create a sense of belonging, make them feel appreciated and recognised for the work, as well as allow CHWs and their direct supervisors to notice improvements in quality of care.

1.2.6 Positive Psychology

As described above, many factors impact performance and motivation of CHWs. LfE aims to emphasise the strengths of CHWs and is an example of PP. Interventions aimed at identifying strengths are also examples of PP interventions, and these include performance appraisal and recognition, which have been proven to motivate CHWs (91, 93).

The term 'positive psychology' was first mentioned by Martin Seligman in his inaugural speech as head of the American Psychological Association in 1999 (102). PP can be split up into three areas of study: positive subjective experience, like happiness, pleasure and gratification; positive individual traits, like talents, interests and values; and positive institutions, including families, schools and businesses (103). PP is more than simply focusing on positive thinking and positive emotions, it also seeks to identify what makes individuals and communities flourish, rather than languish (102, 103).

PP in the workplace is also called Positive Organisational Scholarship (POS). POS is concerned with the study of positive outcomes, positive processes and positive attributes of organisations and their members. POS does not reject the study of dysfunctions and negative outcomes but emphasises the study of factors that enable positive outcomes. POS draws from the full spectrum of organisational theories to understand, explain, and predict the occurrence, causes and consequences of positivity. It comprises attention to enablers (i.e., processes, structures), motivations (i.e., altruism) and outcomes (i.e., vitality, high quality relationships etc.). It is called scholarship as POS aims to provide empirical evidence and theoretical explanations for how and why interventions or certain behaviours have an impact (104-106).

Within POS several characteristics of positivity in the workplace have been addressed. Examples are positive leadership, where leaders look for strengths and support employees to leverage their passions; positive organisational development, where there is a focus on strengths in organisational changes; positive emotions; and organisational virtuousness. These have been shown to lead to better organisational performance, higher organisational commitment, higher supervisor satisfaction, higher future success expectancy, better coping with stress and better job performance, decreased effects of job stressors, lower staff turnover, and higher employee wellbeing (105-112).

A systematic review and meta-analysis looking at the impact of PP interventions at work showed that interventions using PP can improve desirable job outcomes like well-being and job engagement (g=0.25, SE 0.04, p<0.01, 95%CI 0.17 to 0.33). Additionally, PP interventions can reduce job stress (g=-0.34, SE 0.12, p<0.01, 95%CI -0.57 to -0.11) (113). Another literature review, summarizing findings of PP interventions in organisational contexts, showed that PP interventions consistently enhanced employee wellbeing (114).

PP interventions in healthcare have been recommended by the Institute for Healthcare Improvement (IHI), who wrote a 2017 report emphasizing joy in work (115). In 2015 Hollnagel wrote a white paper about Safety 2.0. In Safety 2.0 the number of positive events is emphasised, as opposed to Safety 1.0, the common definition of safety, which entails a lack of errors. This whitepaper highlights the importance of identifying what goes well and building on this (116).

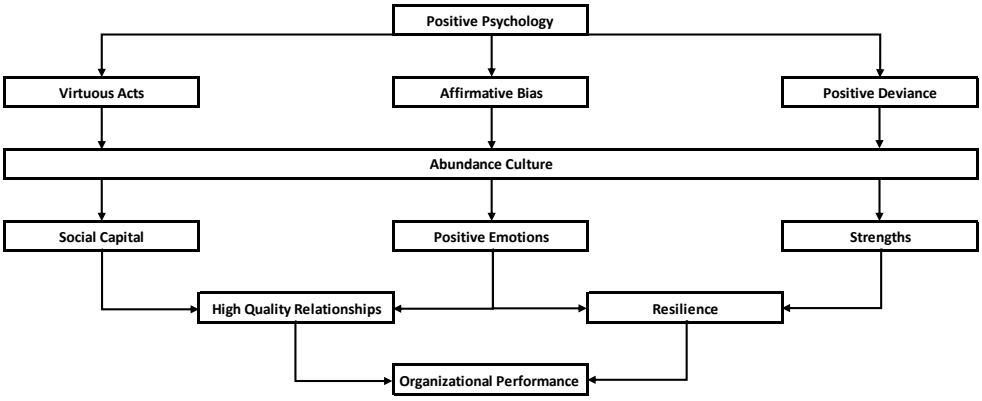
Examples of interventions using PP for healthcare personnel are 'reporting three good things', where participants report three good things that happened each day for 14 consecutive days (117), or coaching based on an individual's strengths (118).

While PP is received with enthusiasm by many, there is also criticism. Lazarus for example argues that there are serious methodological problems with PP research, such as an overstatement of importance of sample or cohort differences, widespread use of cross-sectional research only, and the use of casual methods to measure emotion (119). Wong argued that often negative emotions and experiences are completely ignored when the focus is on PP, however, neither phenomenon can be understood without ref-

erence to the other (120). Others argue that PP interventions and research are accumulating so rapidly, that the field is being built on shaky, non-theoretical foundations (121, 122), a criticism this thesis aims to address.

The impact of PP interventions on organisational performance can be explained with the help of a theory by Lewis, presented in figure 2 (123). This theory explains how organisational performance may be affected by an LfE intervention and is presented in the way of a logic model: it explains what has to happen for a PP intervention to be effective and shows how the PP intervention is expected to work. This theory is helpful in understanding how interventions like PP can impact organisational performance.

Figure 2 Impact of interventions using positive psychology on organisational performance, as proposed by Lewis (109).



Lewis' theory explains that an abundance culture is created through virtuous acts, affirmative bias and positive deviance (123). This abundance culture is an essential element in organisations with exceptionally good organisational performance. Virtuous acts are acts that are undertaken regardless of reciprocity, examples being helping a colleague in need or forgiving someone who has done you wrong. In organisations with affirmative bias the strengths and possibilities in an organisation are emphasised, for example by focusing on what colleagues have done right(123). Positive deviance is defined as *"intentional behaviours that depart from the norms of a referent group in honourable ways"* (124). Positively deviant organisations wish to exceed a normal standard and focus on creating an affluence of good and positive things, rather than just preventing bad things from happening (123). As people are attracted to virtuous actors, social capital is created in an abundance culture. Through the abundance culture intermediate outcomes, which eventually lead to improved organisational performance, the final outcome, are created.

People want to join the virtuous actors and build on each other's contributions, which supports high quality relationships. Furthermore, positive emotions and enhanced strengths are created. This happens because virtuous acts, an emphasis on strengths, and the creation of an affluence of good and positive things makes people feel good (123). The positive emotions and enhanced strengths in turn support the creation of resilience, as described by the broaden-and-build theory by Fredrickson (125). Resilience can be defined as *"the maintenance of positive adjustment under challenging conditions, such that the organisation emerges from those conditions strengthened and more resourceful*" (126). Fredrickson et al. propose that when positive emotions are experienced and strengths enhanced, thought-action repertoires, which are drawn upon during moments of stress, are broadened through the production of thought and action patterns that are notably unusual, creative and flexible (127). The broadened thought-action repertoires in turn support building enduring intellectual, physical, social and psychological resources, which are important in bouncing back from adversity (127). Improved resilience and high-quality relationships subsequently lead to improved organisational performance.

As mentioned in section 1.2.5, it is important to note that payment for CHWs' work is consistently identified as an important motivating factor, and interventions based on strengths in the absence of financial incentives, or hygiene factors, are unlikely to impact CHW motivation, as explained by Franco (79). Strengths-based interventions could however impact motivating factors.

1.2.7 Learning from Excellence

In 2014, LfE, an intervention based on PP, was implemented in the Birmingham Children's Hospital National Health Service (NHS) Foundation Trust in the UK (128). LfE aims to provide a means to identify, appreciate, study, and learn from episodes of excellence in front-line healthcare. In the LfE intervention people identify and report 'excellent' behaviour of colleagues, for example walking five miles during a winter blizzard to come into work when driving or cycling is impossible or going 'above and beyond' for a patient. The report is then fed back to the colleagues involved (128). By explicitly providing positive feedback LfE aims to create positive learning experiences, enhance staff morale and improve patient care (128). To investigate excellent events in the UK a method called Appreciative Inquiry (AI) is used. AI is a conversation between members of a team or a department, aimed at identifying what goes well within the

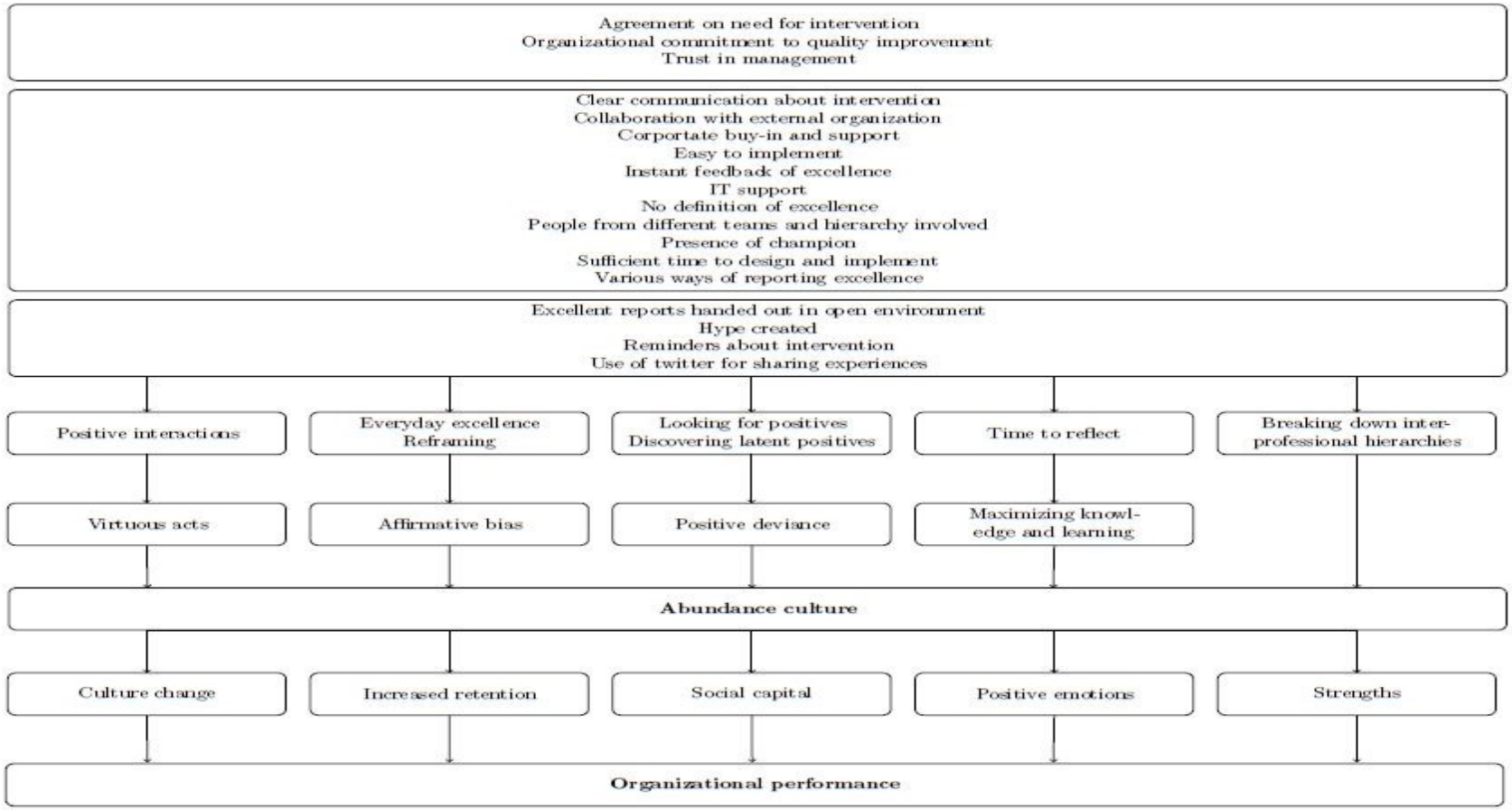
team or department and why this goes well. In AI participants discuss how they would like their team or department to be in the future and how they can achieve this (123, 129).

In 2018 I led an exploratory study in the UK to investigate the potential impact of the LfE and AI interventions on organisational performance in NHS trusts in the UK (15). The study began with a survey, sent to 173 members who subscribed to the Communities of Practice on the LfE website. There were 47 respondents to the survey and three case studies were conducted. Based on the outcome of the case studies Lewis' theory was adapted and a logic model was developed to explain the impact of the LfE intervention on organisational performance in NHS trusts in the UK (15). Apart from potential outcomes of the LfE intervention, mechanisms and contextual factors that led to these outcomes were identified. As the identified contextual factors did not fit in the logic model they were added as necessary preconditions to improving organisational performance (15). The developed theory could help inform the foundations of PP and strengthen them.

In the exploratory study 25 contextual factors were identified, of which 18 acted as a facilitator to organisational performance while seven acted as barriers. Additionally, 11 mechanisms and nine outcomes were identified. Examples of facilitating contextual factors included 'clear and targeted communication about the intervention', 'instant feedback of excellence' and 'presence of a champion'. Mechanisms included 'positive interactions led to more positive interactions' and 'recognising and reframing negative interpretations. Finally, 'motivation', 'positive emotions', 'culture change' and 'resilience' were some of the identified intermediate outcomes, which were expected to impact organisational performance, as shown in figure 3 (15).

The outcomes, mechanisms and contextual factors were integrated into a logic model, as shown in figure 3. The study showed that LfE interventions have the potential to improve organisational performance through intermediate outcomes like 'resilience' and 'culture change', which are achieved through mechanisms like 'positive interactions. While the developed logic model was specific for the impact of LfE in NHS trusts, the described contextual factors, mechanisms and outcomes could be transferable to other settings (15).

Figure 3 Logic model explaining how the Learning from Excellence intervention can potentially impact organisational performance in National Health Service trusts in the United Kingdom (3).



As mentioned before, this study takes place in Malawi and while LfE has not been implemented in Malawi before, as far as I know, in 2015/2016 a study was performed, investigating the impact of an AI intervention for healthcare workers in a hospital setting in Malawi (130). AI is an example of a PP intervention. The study showed that healthcare workers enjoyed the AI intervention, and believed they learnt new skills and changed their attitudes towards each other as they gained knowledge about each other's work practices (130).

After AI was implemented, lower cadre staff felt more valued and part of the team as nurses and clinical officers realised that everyone made useful contributions, which led to improved work relationships. As healthcare workers felt happier about their work, they worked harder. Participants celebrated success, felt empowered and developed a new understanding of their team and organisation. The intervention was thought to lead to improved retention, improved knowledge, better understanding of one another and improved resilience, but also to improved patient satisfaction and outcomes (130).

This study described in this thesis was approved by the Biomedical & Scientific Research Ethics Committee (BSREC) at the University of Warwick (BSREC 55 18-19) as well as the National Health Science Research Committee (NHSRC) in Malawi (19/06/2358).

1.3 Thesis Aim & Objectives

The starting point of this thesis was the impact interventions based on PP, like LfE, could have on the final outcome of organisational performance, as proposed in the theory by Lewis (figure 2) (123). Lewis includes intermediate outcomes including positive emotions and resilience which can subsequently lead to improved organisational performance (123). In the exploratory study, I identified that LfE could potentially impact organisational performance as well through intermediate outcomes including increased retention, positive emotions, culture change and motivation (15). LfE as an intervention could potentially impact CHW organisational performance, through intermediate outcomes such as motivation, as described in section 1.2.5 and the exploratory study.

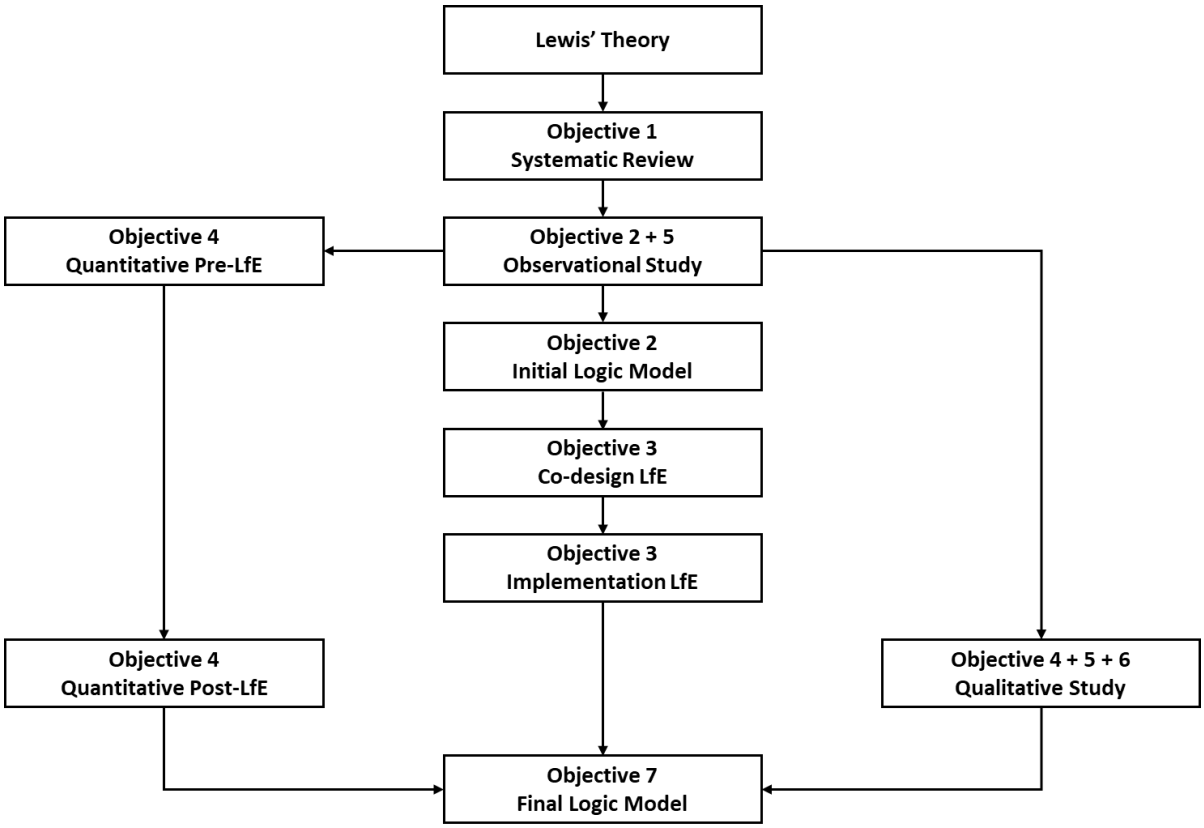
In the current study I aimed to co-design and implement an intervention based on LfE, together with CHWs in Neno District in Malawi. I subsequently aimed to evaluate the impact of the co-designed LfE intervention on CHWs and the organisation with the help of a mixed method study.

While in Lewis' theory, organisational performance is considered the final outcome of interventions like LfE, I did not intend to measure organisational performance directly, but to develop theory explaining how organisational performance could be impacted. Organisational performance was not measured directly because it is impacted by a wide variety of factors with diverse effects, and measurement is likely to be imprecise (131).

An overview of the objectives, and how they related to each other is presented in figure 4. My objectives were:

1. To develop a logic model explaining the impact of interventions using positive psychology for health personnel on organisational performance.
2. To adapt the logic model, as developed in objective 1, to explain the potential impact of a co-designed 'Learning from Excellence' intervention for Community Health Workers in Neno District.
3. To co-design and implement a 'Learning from Excellence' intervention, with key stakeholders and Community Health Workers in Neno District.
4. To assess, with the help of the logic model, as developed in objective 2, the intermediate outcomes of the co-designed 'Learning from Excellence' intervention for Community Health Workers, in Neno District.
5. To assess, with the help of the logic model as developed in objective 2, contextual factors that influenced the intermediate outcomes of the co-designed 'Learning from Excellence' intervention for Community Health Workers in Neno District.
6. To assess, with the help of the logic model as developed in objective 2, mechanisms that led to intermediate outcomes of the co-designed 'Learning from Excellence' intervention for Community Health Workers in Neno District.
7. To adapt the logic model as developed in objective 2, to explain the impact of the co-designed 'Learning from Excellence' intervention for Community Health Workers in Neno District.

Figure 4 Diagram of objectives.

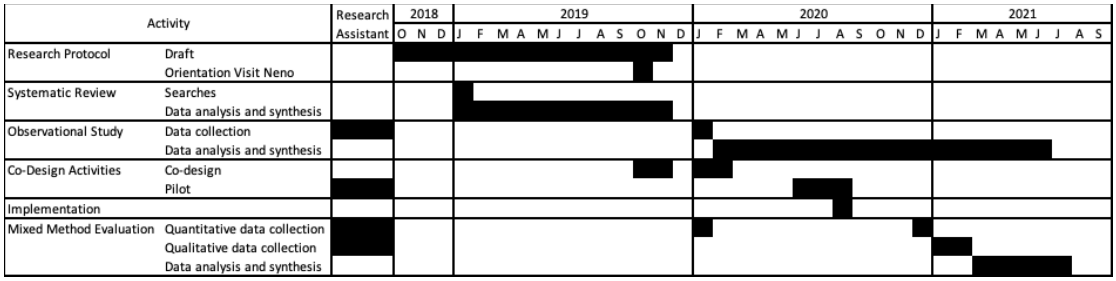


LfE = Learning from Excellence

1.4 Timeline

An overview of the various activities and studies performed as part of this thesis, including the involvement of the Research Assistant (RA) in the various studies is presented in Figure 5. The RA was employed to support translation, implementation, and evaluation activities, as part of Objective 2, 3, 4, 5 and 6.

Figure 5 Gantt chart with an overview of the various research activities conducted as part of this thesis, including involvement of the Research Assistant.



CHAPTER 2: MALAWI AND NENO DISTRICT

In this chapter I will provide an overview of the setting of my study, Neno District in Malawi. I will start with providing background information about Malawi and the Malawian health system, after which background information about Neno District will be presented. I will provide some background about Partners in Health (PIH), the private international not-for-profit non-governmental organisation (NGO) with whom I collaborated for this study, and the various health programmes they deliver, as well as how PIH their programmes are related to the health programmes delivered by the Malawian Ministry of Health (MOH). Finally, I will discuss how Community Health Workers (CHWs) are involved in these various programmes in Neno District.

2.1 Malawi

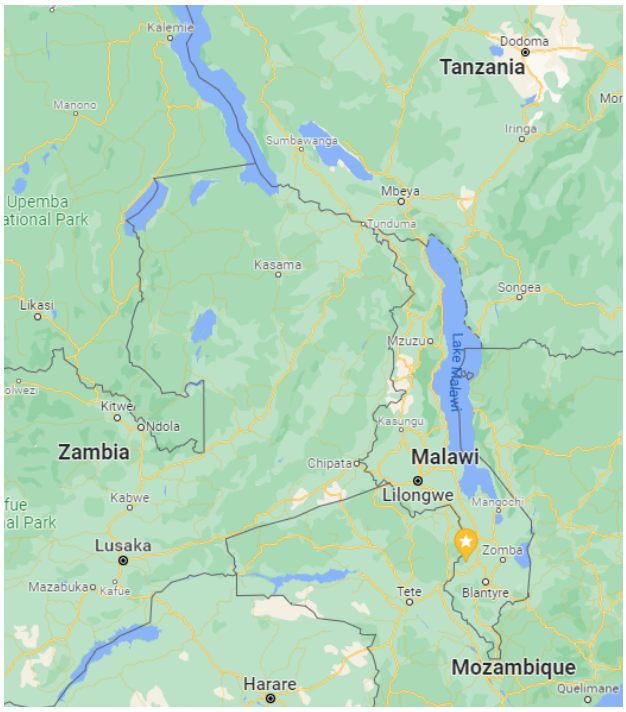
Malawi, see figure 6, had an estimated population of 18.1 million people in 2019. Over the past 40 years its population has grown rapidly with an average growth rate of 2.7% per year, as compared to 2.9% in Zambia, but only 0.6% in the United Kingdom (UK) (132). Malawi's population is young, with 44.0%% being under 15 years of age and only 5.1% of the population aged 60 or older (133), as compared to the UK, where only 17.6% of the population aged under 15, and 22.5% is aged over 60 (134). Malawi's economy is predominantly agro-based with agriculture, forestry and fishing contributing 28% of gross domestic product (GDP) (135).

In 2010 67.2% of the Malawian population lived below the World Bank's poverty line of less than United States Dollar (USD) 1.90 a day (136). Approximately 84% of the population lived in rural areas, of which only 4% have access to electricity (135). While life expectancy in Malawi improved between 1965 and 1989 from 35 years to 45 years, it declined sharply between 1990 and 2003, mainly due to the HIV/AIDS pandemic (137). Since 2004 life expectancy at birth increased again to 63.8 years in 2019 (132).

In 2020, Malawi ranked 174th out of 189 countries on the Human Development Index (HDI) (138). The HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and having a decent standard of living (138). The higher a country scores on the HDI, which provides a score of 0-1, the better. Malawi scored 0.483, lower than the world's HDI of 0.731 (138). On the multidimensional poverty index (MPI), which identifies multiple overlapping deprivations suffered by individuals in health, education and standard of living,

and which again provides a score of 0-1, but the lower the score, the better, Malawi scores 0.243, compared to 0.114 for the World (139). In comparison, the UK scores 0.932 (rank 13) on the HDI, whereas Zambia scores 0.584 on HDI (rank 146) (140) and 0.232 on MPI (141). MPI is only calculated for developing countries, and no information about the UK is available, however for other European countries like Serbia and Ukraine the MPI was 0.001 (142, 143) .

Figure 6 Malawi, with the star indicating the location of the District Hospital in Neno District (130).



Malawi is divided into a northern, central, and southern region and each region is divided into districts (28 in total). The districts are subdivided into traditional authorities, which are sub-divided into villages, the smallest administrative unit (135). My study took place in Neno District in the southern region of Malawi, bordering Mozambique.

2.1.1 Health in Malawi

The government's expenditure on public health in Malawi was 16.8% of GDP in 2014, which is higher than the 15% target set out in the Abuja Declaration in 2001 (144). Development aid plays a key role in Malawi's economy, and it contributes about 62% of health sector funding (135).

There are several health challenges in Malawi. While estimated HIV prevalence among 15-49 year old went down from 11.3% to 17.7% in 2003 (145) to an estimated prevalence of 7.9% to 9.6% in 2019 (146), HIV remains one of the four main causes of disability in Malawi. Other causes of disability include respiratory infections, malaria, and diarrheal diseases. Additionally, maternal mortality rates are high with 349 maternal deaths per 100,000 live births in 2017 (147).

On the other hand, there have been healthcare successes as Malawi achieved Millennium Development Goal (MDG) 4 (reducing under-5 mortality by two-thirds between 1990 and 2015) as infant mortality decreased from 234 deaths per 1,000 live births in 1992 to 85 deaths per 1,000 live births in 2014 (148). This decrease was a result of investment in interventions like vaccines, effective treatment for malaria and diarrhoeal diseases, vitamin A supplementation, prevention of mother to child transmission of HIV and exclusive breast feeding for the first six months of life (148).

There is a shortage of health workers in Malawi, with only 0.036 physicians per 1,000 population in 2018 (149) compared to 1.6 per 1,000 in 2017 for the world on average (150). Zambia had 0.16 physicians per 1,000 population in 2018 (151), whereas there were 2.8 physicians per 1,000 population in the UK in 2018 (152). Many Malawian-born healthcare professionals work abroad. Of the physicians born in Malawi, 59% appeared in a circa 2000 census of nine receiving countries, including the UK and United States of America (USA), compared to 57% of physicians born in Zambia. Of Malawian-born nurses, 17% appeared in a census of a receiving country, compared to 9% of nurses born in Zambia (153). A qualitative study, published in 2006, showed various reasons explaining why health professionals leave Malawi, including inequitable salaries and lack of recognition of experience, overwhelming responsibilities, and the lack of stimulating interaction in the workplace, limited access to further training and limited career recognition and, lack of transparency for staff recruitment. Other factors included inadequate supervision and health workers were worried they were at increased risk of exposure to HIV (154). Another study, performed in 2008 and aimed at identifying demotivating factors for health personnel in Malawi, showed that staff felt under-valued as there were management issues, financial issues, lack of sufficient housing and infrastructure and lack of promotion and recognition or in-service training. Lack of resources, staff shortages and high workload led to poor quality patient care, which demotivated health personnel and made them leave the health profession in Malawi (155).

2.2 Malawian Health System

Health services in Malawi can be public, private-for-profit and private-not-for-profit. All health facilities under the government are public and free of charge at the point of use. The private-for-profit sector comprises of private hospitals and clinics as well as traditional healers, which are common in Malawi. The private-not-for-profit sector includes healthcare provided by religious institutions (e.g., Christian Health Association Malawi (CHAM)), NGOs, and statutory corporations and companies. Most private-for-profit and private-not-for-profit providers charge user fees for their services (135).

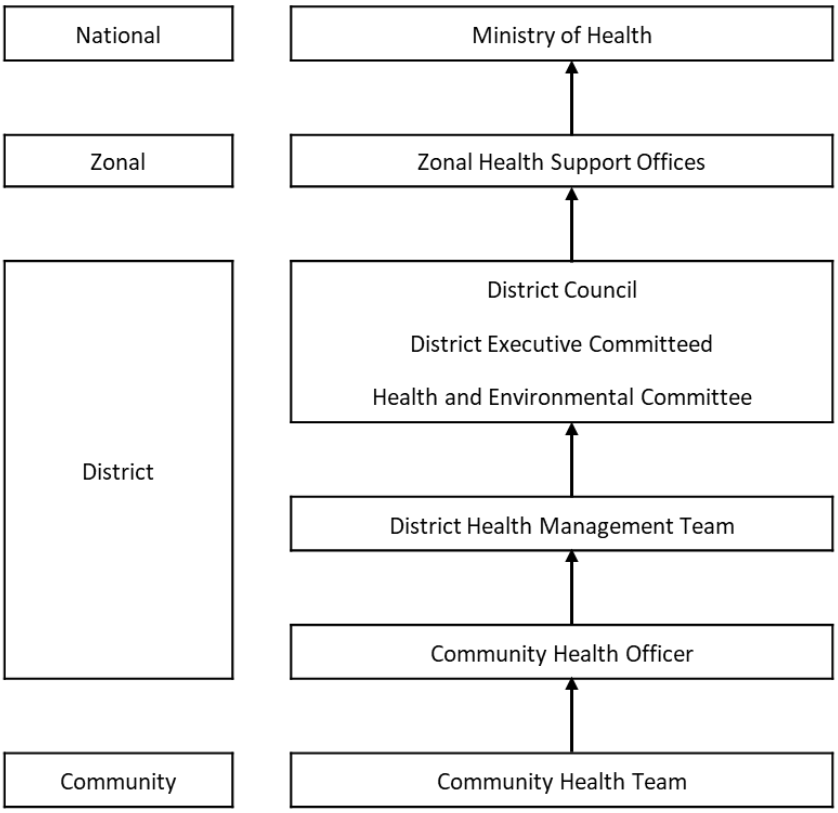
In 2018, 11.2% of health expenditure in Malawi was out-of-pocket expenditure, as compared to 10.0% in Zambia and 16.7% in the UK (156). In a 2012-2013 study, published in 2020, 26.2% of illness episodes treated at a formal health facility generated an out-of-pocket expense on medical treatment with a mean of Malawian Kwacha (MWK) 678.45 (SD = MWK 758.63), at the time equivalent to USD 2.72 (157). In total, 21.4% of illness episodes incurred transportation costs with a mean of MWK 516.13 (SD = MWK 458.55), equivalent to USD 2.07 (157). Another paper reported that out-of-pocket expenses are estimated to lead to catastrophic health expenditure for 0.73% to 9.37% of households (158). Catastrophic health expenditure entails that the out-of-pocket payments consume a large portion of a household's income (158).

Public sector healthcare delivery is organised into four tiers: community, primary, secondary, and tertiary. The community tier includes health services delivered in the communities, including village clinics, health posts and community health workers (CHWs) (159). The primary tier includes services delivered at dispensaries, maternity facilities, health centres and community, and rural hospitals. Patients referred from the primary tier end up in the secondary tier (159). Services delivered in this tier are provided in district hospitals or CHAM hospitals, which account for 9.5% of all facilities in Malawi. Apart from referral services, secondary care centres also provide inpatient and outpatient services for those living nearby (159). The tertiary tier includes services provided at central hospitals, attended by patients referred from district hospitals. Specialist services are provided in the central hospitals, which serve entire regions. Central hospitals additionally offer professional training and support to district hospitals. Due to lack of an adequate gate keeping system, 70% of services provided by tertiary health facilities constitute primary or secondary care services (159). Patients regularly bypass health

centres and district hospitals altogether because of shorter waiting times and better quality of services in tertiary centres (159). In 2015 the Malawian government introduced bypass fees at four tertiary hospitals in Malawi (160). The bypass fee of MWK 1,500 (~USD 1.85), later increased to MWK 2,500 (~USD 3.08) in two facilities, was faced by patients who sought treatment at the tertiary facilities directly. Several NGOs worried that the bypass fee measure would deepen inequality as many Malawians are not able to afford the fee (160).

In this chapter I will focus on community and primary health services as these are the focus of my study. Community health services aim to bring healthcare closer to communities and connect people to the health system, which is important as approximately 24% of Malawi's population does not live within five kilometres of any type of health facility, something which was mentioned as key barrier to access by 56% of Malawian women (161). An overview of the organisation of the community health system is provided in figure 7.

Figure 7 Malawian community health system (148).



Community health volunteers are present in the communities and report to Health Surveillance Assistants (HSA), who each serve approximately 1,000 community members and report to a senior HSA.

Senior HSAs are based at the health facility and report directly to the community health team, comprising of the Assistant Environmental Health Officer (AEHO) as well as the Community Midwife Assistant and the Community Health Nurse. The community health team report to the Community Health Officer (CHO) at district level, who in turn reports to the District Environmental Health Officer (DEHO). The DEHO is part of the District Health Management team, headed by the District Health Officer (DHOf), who in turn is a member of the District Executive Committee (DEC). The DHOf reports about what is happening in the communities. The Health and Environmental committee also report to the DEC, which in turn reports to the District Council, which reports to one of five Zonal Officers, who in turn link the districts to the MOH, as presented in figure 7 (161).

2.2.1 Health Surveillance Assistants

In my research I worked with CHWs working volunteering with PIH, the private-not-for-profit international NGO I collaborated with. Additional information about PIH and their programmes in Neno District is presented in section 2.4. First I will present more information about HSAs. The HSA is the CHW cadre as set up by the Malawian government. HSAs evolved from Cholera Assistants, who were trained to help fight a cholera outbreak in the 1970s (162).

Over the years the Cholera Assistants were given additional tasks, including prevention and promotion of services, due to task shifting to address human resource gaps in the Malawian health system. Their name was changed from Cholera Assistant to Health Surveillance Assistant. The HSAs comprise 30% of the health workforce in Malawi and they are often the only health workers serving rural communities (162). HSAs provide disease surveillance, promote community participation in healthcare activities and perform microscopy and HIV testing and counselling. Additionally, they deliver child immunisation services. While they don't provide curative services, they have been very important in the delivery of community health services, including integrated community case management (161, 163).

HSAs must have completed the Malawi School Certificate of Education or Junior Certificate of Education and an MOH approved HSA pre-service training programme. HSAs receive three types of training: 1) initial training, lasting 12 weeks, during which they are introduced to the role of HSA and they acquire some basic skills; 2) additional training, which builds on those skills and provides in-depth information on certain topics; and 3) on the job training (163).

There is a shortage of HSAs, as another 7,000 HSAs are needed to meet the policy recommendation of one HSA per 1,000 people. HSAs are also unevenly distributed across Malawi, with some areas having almost none (161). Other challenges experienced by HSAs regard the supply chains and infrastructure in the community health system. Many catchment areas have inadequate transport for HSAs, who thus may have to walk long distances, and many HSAs struggle with resource shortages due to poor stock management and/or insufficient funds. These challenges are particularly acute in hard-to-reach areas, which, apart from large travel distances, often have fewer health workers than more accessible catchment areas (161, 163).

2.3 Neno District

I performed my research in Neno District, one of the 28 districts in Malawi, see figure 8. Neno District was chosen for this research as the district's CHW programme was well-established, see section 2.4, making it a suitable context for a new intervention. Additionally, PIH were eager to be involved in this research due to the appreciative nature of Learning from Excellence (LfE), which differed from previous interventions. Finally, my primary supervisor had existing contacts because they collaborated with PIH on a project regarding CHW selection (178).

Neno District is located in Southwest Malawi, in the southern region and borders with Mozambique (164). It is a remote, mountainous, and hard to reach region. The majority of Neno District's population, estimated at 165,000 in 2017, are subsistence farmers (165). Only 5% of people in Neno District have access to electricity (166). In 2010 HIV prevalence in southwest Malawi, where Neno District is based, was 15%, the highest in the country (166).

Neno District is divided in two parts: upper Neno, referring to the mountainous area and lower Neno, referring to the flatter area. In 2008 a 120-bed district hospital was built in Neno town, based in upper Neno and in 2011 a community hospital was opened

in Lisungwe, in lower Neno. Furthermore, there are 12 health centres, the newest of which opened in 2016 (166, 167). The 12 health centres are typically staffed by 1-2 nurses and a medical assistant and serve 1,800 to 20,000 people including 100-200 out-patient appointments per day (167). Additionally, there are 78 health posts, with 3-11 health posts serving each health centre (168).

Figure 8 Map of Partners in Health supported health facilities in Neno District (153).

Access to essential care in Neno District is a challenge as the quality of roads is poor, particularly during the rainy season, which runs from November to March, with heaviest rainfall from December to February (169). There is no public transport serving the district and, due to poverty, people have no access to motorised vehicles (165). A study, performed in 2018, comparing the percentage of patients walking over one hour to reach a health facility in three districts in Malawi, showed that about 60% of patients in Neno District walked for over one hour, compared to 48% in Thyolo, another rural district, and 17% in Blantyre, an urban district (170). While many in Neno District still have to walk a long way, due to decentralisation of services 80% of patients in Neno District travel less than 8 km to reach their nearest or chosen facility (171). Before

decentralisation, most patients seeking HIV care were from the villages near the district hospital, while HIV was prevalent in the rest of Neno District as well. After decentralisation of HIV services, patients seeking HIV care came from all over Neno District. Proximity to care thus appeared to be a key driver for treatment initiation and adherence in Neno District (171).

2.4 Partners in Health

In 2007 PIH, an international not-for-profit NGO, locally known as Abwenzi Pa Za Umoyo (APZU) was invited by the Malawian government to come to Neno District. PIH's global mission is to create a preferential option for the poor in healthcare by accompanying the public sector in strengthening health services, professional training, and mentorship, as well as targeted research. They aim to bring benefits of modern medical science to those most in need of them and to serve as an antidote to despair (172). PIH was founded by Dr. Paul Farmer, Ophelia Dahl, Dr. Jim Kim, Todd McCormack, and Thomas J. White in 1987 to support work providing care to poor patients in Haiti. PIH has expanded to Peru in 1994 where it supported the government in fighting a multidrug-resistant TB epidemic. Over the years PIH expanded to Russia (1998) Rwanda (2005), Lesotho (2006), Malawi (2007), Navajo Nation (2009), Kazakhstan (2010), Mexico (2011), Sierra Leone and Liberia (2014) (173).

2.4.1 Community health workers

Community health workers are a pivotal element of PIH's work. CHWs working with PIH live in the communities in which they work, and help community members access healthcare, as well as social support, like food and safe housing. They check up on patients in the community, accompany community members to health facilities for appointments and educate community members on topics like mental health, nutrition and TB (173).

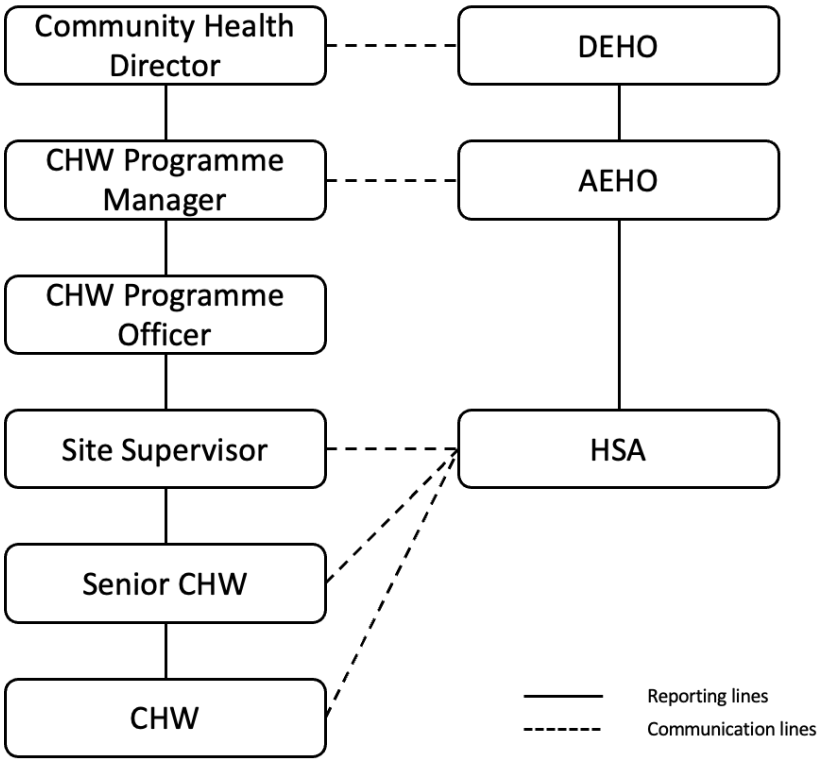
The role of CHWs in the various programmes provided by PIH in Neno District will be described below. The role of CHWs in Neno District differs from the role of HSAs, who work for the MOH, and figure 9 provides an overview of how the PIH CHW programme is linked to the MOH HSA programme. It is important to note that the CHWs in Neno District are volunteers and are trained by and work for PIH.

2.4.1.1 Reporting structure for Community Health Workers in Neno District

As part of my orientation visit to Neno District in October 2019 I developed an overview of reporting structures in the CHW programme. CHWs report to senior CHWs

(SCHW), of which there is one in every village. The SCHW supervises CHWs and performs household visits as well. The SCHW collects sputum of potential TB patients and every month they collate data gathered by CHWs in their village. Every three months the SCHW conducts three supervision visits. During the first visit they observe a CHW during a household visit and provide some feedback about what they have seen. During the second visit the CHW observes the SCHW during one of their household visits. Finally, there is an 'on-the-spot' check, where the SCHW visits the households assigned to the CHW to check if they are happy with the CHW and feel safe. Gaps are identified to see where extra support may be needed (166).

Figure 9 Reporting structure for community health worker and health surveillance assistants in Neno District.



AEHO = Assistant Environmental Health Officer
CHW = Community Health Worker
DEHO = District Environmental Health Officer
HSA = Health Surveillance Assistant
MOH = Ministry of Health
PIH = Partners in Health

The SCHWs report to the Site Supervisors of their respective catchment areas. During meetings with the Site Supervisor, they aggregate data from the villages in order to develop an overview of the data from the catchment area. The Site Supervisor is in direct contact with the HSAs in the catchment area, thus linking PIH to MOH. Data from the catchment area is provided to the CHW Programme Officers. There are two

CHWs Programme Officers, one for the seven health centres in upper Neno and one for the seven health centres in lower Neno. The CHW Programme Officer for upper Neno is based at the PIH District Health Office (DHO), whereas the CHW Programme Officer for lower Neno is based at the Community Hospital (own notes, taken for own reference, not as part of data collection).

CHW Programme Officers report to the CHW Programme Manager. The CHW Programme Manager oversees the everyday running of the CHW programme, including the budget. The CHW Programme Manager reports to the Community Health Director (CHD), who oversees the three different community health programmes in Neno District: CHW Programme, Community Programme and the Programme on Social and Economic Rights (POSER). The CHD in turn reports to the Chief Medical Officer (CMO) who oversees clinical and inpatient departments, as well as the primary care programme, community programmes and the monitoring and evaluation programme. An overview of all these stakeholders, including who they report to and where they are based, i.e., in the community, health facility or district health office, is provided in figure 10 (own notes, taken for own reference, not as part of data collection).

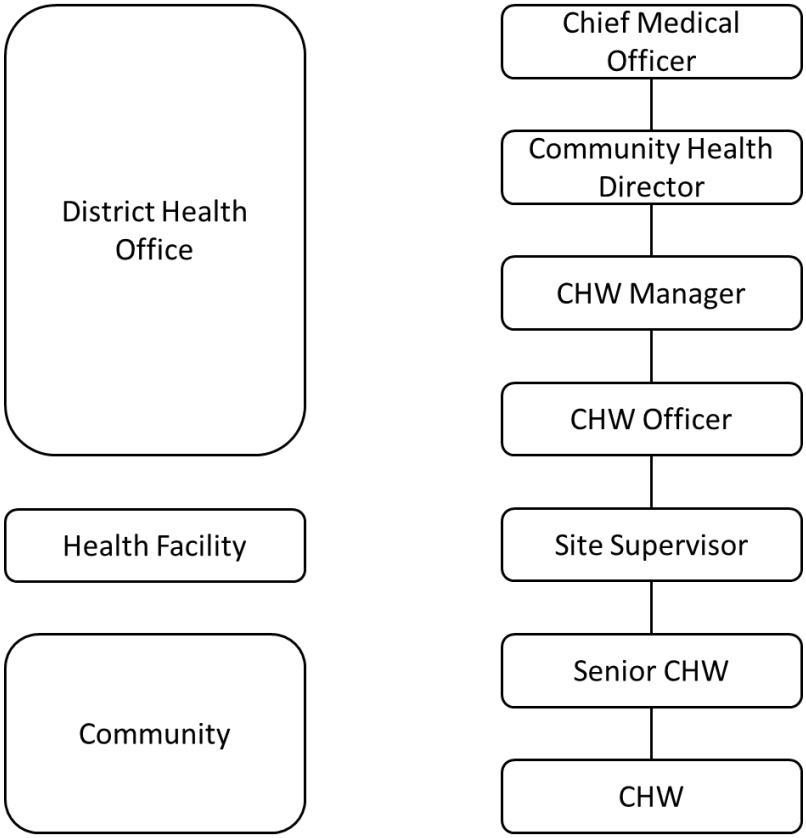
To ensure timely communication between the different levels of staff there are several supervision meetings: CHW management meetings at district level, Site Supervisor meetings at district level, SCHW meetings with Site Supervisors in each catchment area, meetings with Site Supervisor and health facility staff to review data and performance, weekly check-ins between Site Supervisors and HSAs to discuss case finding, and monthly village-level CHW and SCHW meetings for data aggregation (174).

2.4.2 HIV/AIDS service delivery model

When PIH arrived in Neno District in 2007 they implemented an innovative HIV/AIDS service delivery model in which CHWs played an important role. In the HIV/AIDS programme each CHW was assigned up to six TB and HIV patients who they would visit frequently (166). CHWs supported patients with treatment adherence, accompanied patients to appointments at the health centre, traced patients who missed appointments, and screened patients to identify side effects and ill patients early. CHWs were further instructed to flag any other issues to clinical staff at the health facilities. CHWs were trained to execute the assigned tasks and they received a stipend for their efforts (175). Alongside the HIV/AIDS programme, a programme to track patients who missed appointments and a programme aimed at addressing social determinants for health, in

which food packages and cash transfers were provided to those starting antiretroviral treatment (ART) were introduced (175).

Figure 10 Overview of stakeholders in the Partners in Health Community Health Worker Household Model.



CHW = Community Health Worker

The HIV/AIDS programme was successful and higher ART retention rates were achieved in Neno District compared to retention rates in Malawi as a whole. The 1-year retention rates of 96.2% in Neno District, compared to 83.9% in the rest of Malawi, were comparable with Rwanda and Zambia, but achieved at lower costs than in these countries (175). Neno District's 1-year survival rate for ART patients was 87.9% compared to 78.8% for Malawi as a whole (175).

2.4.3 CHW Household Model

In 2016 the role of CHWs was expanded. Initially maternal health was added to the CHW portfolio, which led to an increase in facility-based deliveries and attendance of antenatal care (PIH internal data). The main change for CHWs came with the introduction of the 'Household Model' in 2016 which was co-designed by clinical staff and CHW programme staff, in consultation with community members, HIV patients and

community leaders. The programme was piloted in two catchment areas for 18 months before roll-out in the remaining 12 catchment areas in the district (166).

In the household model each CHW is assigned 20-40 households which they visit once a month, with more frequent visits to household members enrolled in HIV or TB treatment programmes. A household is defined by the family unit and the head of household, encompassing all dependents that individual is providing for. The ratio of 20-40 households entails that each CHW provides longitudinal support to approximately 12 patients with chronic illness and approximately six pregnant women. To maintain this ratio, 252 new CHWs had to be recruited (174). As of January 2020, there were 1228 CHWs working in the Household Model. Each village had one senior CHW (SCHW), with two or more SCHWs for villages over 300 households (166). CHWs work as volunteers, and receive a monthly stipend of MWK 15,000 (USD 21), while the SCHW receives a stipend of MWK 23000 (USD 32) (166), which is approximately half of the HSA salary of MWK 40,000-45,000 (176).

During the household visits the CHWs provide education and screen for common conditions including TB, paediatric malnutrition, and sexually transmitted infections. CHWs accompany pregnant women to a health facility for pregnancy confirmation, antenatal care visits, intrapartum care and two postnatal care visits. Furthermore, they accompany clients to health facilities for emergency visits (177). CHWs provide psychosocial support to patients and encourage treatment adherence. Finally, as described above, they help in tracing patients who have missed appointments at the health facility (166). CHWs provide screening, but not medical care, during home visits (177). When the roll-out of the household model was completed in 2018 approximately 29,000 households (98% of total households in Neno District) received monthly CHW visits (174).

2.4.3.1 CHW recruitment

Primary education is a prerequisite for CHW work and CHWs have an average of 5-6 years of primary education (178). Selection of CHWs for the household model was done based on personal requirements and programme requirements. Important personal requirements were acceptance of, and time for, CHW tasks, which take up approximately 20 hours per week. Additional requirements constituted literacy in Chichewa as tested with a literacy test, compassion, good health, and ability to travel long distances on foot (166, 178). The SCHWs were typically previously employed as a CHW, and

they were mature and respected members of the community. They had to demonstrate leadership and/or problem-solving skills during the CHW training, above-average understanding of the curriculum and strong data aggregation skills (166).

CHWs completed a five-day initial training which provided information about the household programme and its objectives, the role of CHWs and the specific tasks for each primary health focal area as well as the core home visits. Following the training CHWs had to complete a written knowledge assessment, based on a blueprint defined by CHWs' roles in disease areas, consisting of 20 items, with a total of 30 marks available. CHWs were given 60 minutes to complete the assessment (179). SCHWs attended an additional 2-day training on mentorship and supervision procedures (174).

2.4.3.2 Outcomes

The household model led to an increase in pregnant women who attended antenatal care clinics and more pregnant women received intrapartum care (177). The non-communicable disease (NCD) monthly default rate declined from 4.2% in the pre-household programme period to 2.8% after the implementation of the household model. The proportion of surviving NCD patients increased from 95.7% to 97.1% and the percentage of patients successfully completing treatment for TB increased from 39.5% to 48.0% (174).

2.4.4 Integrated Chronic Care Clinic

After HIV/AIDS, the leading cause of death in Malawi are NCDs, and while infectious diseases remain the main cause for adult admissions to the hospital, NCDs most frequently cause deaths in adults over 55 years old (165). In 2009 a Chronic Care Clinic (CCC) was introduced at the District Hospital in Neno Town, aimed at providing ongoing management of NCDs, like hypertension, epilepsy, diabetes, and congestive heart failure (167).

In 2013 the clinic expanded to the community hospital in Lisungwe, but clinical staff continued to notice an increasing burden of NCDs in the district. Clinics were running smoothly by August 2014, but only 277 patients with hypertension attended the clinic while data suggested approximately 33% of adults in Neno District have hypertension, meaning only 1.1% of hypertension patients attended the clinic (167). As NCD care was only provided in two areas, namely the District hospital and Community hospital, there was a high default rate (34%), possibly due to long distances and bad roads, which

led to travel times of two hours or more. Staff noticed that about 20% of the CCC patients were HIV-positive, and they had to visit the hospital on separate days for their HIV and CCC appointments, which could be difficult for them due to long travel times and responsibilities at home (167). PIH investigated extending the CCC programme to other clinics, but this proved difficult due to limited human resources (166).

In 2015 the HIV Care Clinic and CCC were merged into the Integrated Chronic Care Clinic, otherwise called IC3 or 'ice-cubed'. IC3 staff travel around the various health facilities in Neno District, allowing services to be provided nearer the patient, who only have to attend one appointment for NCD as well as HIV care. No new staff had to be hired (166). The IC3 team consists of 13 integrated care clerks (formerly ART clerks), two nurses, two HIV testing counsellors, four HIV expert patients and four clinicians split across the two hospitals.

In IC3 clinics patients are treated for the following conditions: HIV, hypertension, epilepsy, asthma, diabetes, and mental illness. Patients with pre-existing NCD diagnoses were automatically enrolled in the new IC3 programmes and new patients are referred to the IC3 programme from inpatient wards, outpatient screening and community screening events (see 2.4.5 Other programmes) (180).

Patients who recently started treatment are scheduled to be seen on a monthly basis, while those enrolled for a longer period of time are seen every three months (180). During the IC3 visits, patients are routinely screened for nutrition, diabetes, hypertension, HIV and TB (166). In January 2019, 8432 HIV and 3792 NCD patients, including 203 patients with diabetes were enrolled in IC3 (181).

CHWs are involved in the IC3 clinic in various ways: they accompany patients to the health facility and help the IC3 team with collecting information about blood pressure, Body Mass Index (BMI) and other routinely collected data. They furthermore support the team with identifying patients who have missed appointments and encourage these patients to attend the IC3 clinic. Furthermore, they refer patients to the clinic through screening during the monthly household visits and assist during community screening events (own notes).

In October 2019 I visited Neno district for one week, to meet those involved in the CHW programme and to learn more about the various PIH programmes and activities. I conducted some co-design activities during this visit, as explained in Chapter 6, but

otherwise I did not collect data during this visit. During the orientation visit I attended an IC3 clinic as part of a site orientation visit. We drove up to the health facility with the IC3 team and upon arrival the pharmacist and clinician went to a consultation room. The rest of the team went to the outpatient department where approximately 50 patients were already waiting. Several CHWs helped with measuring and weighing the patients, testing their blood sugar, blood pressure and collecting their sputum. Patients were sitting quietly on benches while the CHWs went around the room to perform their measurements. The outcomes of measurements were noted on the patient file, as carried by the patient. The patients were registered by the clerks and afterwards they went to the waiting area, where they again sat on benches, before being seen by the clinician and pharmacist (own notes, taken for own reference, not as part of data collection).

2.4.5 Screening programmes

There are two screening programmes run by PIH in Neno District, see table 1. The first, Screening for Health and Referral in the Community (SHARC) was introduced in 2015.

Table 1 SHARC and SHARF screening programmes.

Screening Programme	SHARC	SHARF
Who performs screening	Mobile team: community programme, clinical, MOH and partners.	Staff at health facility
Who is screened	Community members	Patients waiting for outpatient appointment
Where	Hard-to-reach villages	Health Centre
What for	Nutrition, HIV, TB, Diabetes, hypertension, and family planning	Nutrition, HIV, TB, Diabetes, HTN and FP
What next	Patents linked to IC3	Patients linked to clinician

HIV = Human Immunodeficiency Virus
IC3 = Integrated Chronic Community Care programme
MOH = Ministry of Health
SHARC = Screening for Health and Referral in the Community
SHARF = Screening for Health and Referral in the Facility
TB = Tuberculosis

In SHARC all eligible individuals who want to be screened for one or more conditions, including HIV, TB, diabetes, and hypertension, are screened in the community, by support staff. An available clinician decides if a community member needs to be referred to the IC3 at their nearest health centre (165).

Screening for Health and Referral in the Facility (SHARF) was introduced in May 2015 (166). During SHARF all patients presenting at the outpatient department are offered to be screened the set of conditions in SHARC and female patients are also offered

screening for cervical cancer. Screening takes place while patients are waiting for their appointment (165).

2.5 Reflexivity

During my research I was not working for Partners in Health (PIH), the international non-governmental organisation (NGO) responsible for the CHW programme in Neno District, I was an outsider, meaning I did not share the experiences of the research participants. Further details regarding reflexivity are presented in Chapter 10, where I will discuss how my background impacted data collection and analysis. However, it should be noted that I am a young white woman from a high-income country; that I do not speak Chichewa and that English is my second language.

2.6 Conclusion

In this chapter I provided an overview of Malawi, the health system in Malawi as well as the various programmes implemented by PIH in Neno District and how these are linked with the programmes provided by the Malawian Government.

In the rest of this thesis, I will focus on the CHWs and SCHWs volunteering for PIH within the household model.

CHAPTER 3: RESEARCH PARADIGM

3.1 Introduction

To perform the research in this study I have made use of realist evaluation methodology. In short, in a realist evaluation the researcher aims to identify what works (outcome) how (mechanism), for whom and in which circumstances (context). I decided to use this methodology as it allowed me to not only gain insight into the impact of the co-designed Learning from Excellence (LfE) intervention for Community Health Workers (CHWs), but also how this impact is achieved, or not. I hoped that this methodology would thus allow me to identify what it is about the LfE intervention that led to impact (or no impact) for CHWs, to provide a generalizable overview of LfE intervention for CHWs, which could support future designers and implementers of similar interventions for CHWs.

In this chapter I will provide a short background about realist evaluation methodology, including the research paradigm from which it has emerged. I will further explain the definitions of contexts, mechanisms, and outcomes and finally I will explain how all of these are integrated into context-mechanism-outcome configurations.

3.2 Realist Evaluation

Realist evaluation is mapped to philosophical roots of realism, where theories are used to provide knowledge about the unobservable as well as observable entities, forces and processes, as opposed to positivism, which states that knowledge is exclusively derived from observable phenomena (182). Authors like Bhaskar (183), Harre (184), and Collier (185) have written a lot about realism in science, but they have taken a normative turn, particularly in critical realism. Realist evaluation on the other hand aligns more with those who have tried to develop realism as an empirical method (182).

The goal of a realist evaluation is to explain regularities, or ((semi)predictable) patterns in society. In a realist evaluation these patterns are explained with the help of an underlying, and potentially hidden, mechanism, explaining the interplay between various factors that help generate the pattern. Mechanisms will only occur, or "fire", in particular contexts (186). The change in patterns over time, for example, the change in patterns before implementation of an intervention, like LfE, and after implementation of the intervention, leads to the outcomes of the intervention in question (186). It is thus not the intervention itself that works, or doesn't work, but it is the intervention's ability to

break into, and change, existing societal structures, or existing chains and resources, that led to the pre-intervention situation. By breaking into these existing structures a pattern can be changed, leading to new outcomes (186).

In realist evaluation the researcher aims to identify mechanisms of change that are introduced or triggered by an intervention, as well as how these mechanisms can counteract mechanisms that lead sub-optimal outcomes (186). A new intervention introduces new resources into a particular context, and these resources can trigger new mechanisms, which can counteract existing mechanisms leading to the sub-optimal outcome. The researcher aims to identify the social, including cultural, conditions necessary for change mechanisms to operate and how they are distributed within and between contexts (186).

In 'The Science of Evaluation: A Realist Manifest', Ray Pawson, one of the 'founders' of realist evaluation methodology, presents seven 'pillars of realist wisdom', which explain the theoretical foundations of realist evaluation methodology: it is theory-driven, based on realism and empirical (187).

Pillar 1

The first pillar regards Bhaskar, who proposed that an evaluation should start with a theory about how the to be evaluated intervention could affect the system in which it is introduced. As Bhaskar puts it *"theory without experiment is empty. Experiment without theory is blind"*(183).

- ➔ Realist evaluation is theory driven.

Pillar 2

The second pillar is Archer and their Realist Social Theory. According to Archer, social systems are 'morphogenic', meaning that the balance of mechanisms, contexts and patterns that sustain social order are prone to constant self-generated reshaping (188).

This implies that an intervention that is introduced to change participant's choices, and thus social order, in turn mutates to fit the new social order as developed by the intervention's outcomes. This new order means that the conditions that made the intervention work in the first place have changed. Archer thus proposes that change created by

social interventions can never be anticipated, making the outcomes of an intervention unpredictable (188).

- ➔ Interventions are implemented into pre-existing social structures that are crucial for determining the intervention's impact.

Pillar 3

The third pillar consists of a theory proposed by Elster, explaining social behaviour. They propose that all programme theories, which explain how, for whom and in what circumstances the intervention leads to which outcomes, identify (un)intended outcomes, generated by mechanisms. However, no programme theory is universally correct as all theories depend on the context in which they take place (189).

- ➔ There is no universally correct programme theory.

Pillar 4

The fourth pillar regards Merton, on theoretical sociology and the middle-range theory. In a middle-range theory, which is more general than a programme theory, abstract explanations for outcomes are put forward to deal with different spheres of social behaviour and social structure. This entails that middle-range theories, unlike programme theories, as mentioned in pillar three, can be easily transferred to different contexts. Merton proposes that the starting point of an evaluation should be a middle-range theory that has been used before. Subsequently, commonalities between the intervention in one context as well as interventions acting under the same middle-range theory in a different context should be identified (190).

- ➔ While specific contexts and interventions may vary, a middle-range theory provides an abstract explanation, allowing programme theories to explain outcomes in different social settings.

Pillar 5

Karl Popper makes up the fifth pillar with their logic of scientific discovery, proposing that science foundations are sometimes unstable. Evaluations and theory development help strengthen these foundations (191).

- ➔ Theory adds to existing theory, thus further building foundations.

Pillar 6

The sixth pillar is made up by Campbell, who recognises the importance of collecting various types of evidence, but also says that no matter how much evidence is collected, data will not be objective. Subjectivity occurs as the inferences drawn from the data are driven by our hypotheses. Campbell argues that theories must be tested and retested. Campbell emphasised the importance of looking at the quality of reasoning in research output, rather than only the quality of data that was collected (192).

- ➔ Existing theories have to be tested and re-tested. Quality of reasoning is as important as quality of collected data.

Pillar 7

The final pillar is made up by Rossi and their iron law of evaluation, which proposes that the expected value of any net impact assessment of a large-scale intervention is zero, as different mechanisms cancel each other out. They propose that interventions only work when implemented in a particular way, when they target well-defined outcomes for the right participants in the appropriate circumstances. Rossi proposes that rather than choosing an effective intervention, policy makers should identify the best target for a certain intervention. This is particularly relevant for randomised controlled trials because while the intervention tested may not work for all participants, there may be a sub-group of participants for whom the intervention does lead to intended outcomes (193).

- ➔ Not the best intervention should be identified, but the best target for a particular intervention.

3.3 Context

Interventions are always introduced into a pre-existing social context, which is important in explaining successes or failures of the interventions (186). The operation of intervention mechanisms is always contingent on context, and participants in the intervention will only act upon resources and choices offered by an intervention if their context is conducive to do so (186). Social context does not only refer to the spatial, geographical or institutional location in which the intervention is introduced, but also the prior set of social rules, norms, values, economic regulations and interrelationships within the location (186). An intervention introduces new ideas and/or resources into

the existing set of social relationships, which may enable or disable mechanisms of change. The context is thus an integral aspect of the intervention (186).

While there are various ways in which contextual factors can be differentiated, as described in table 2 (194), I treated them as static, passive, uniform, external, temporally located in the short term and simple in this thesis. I chose to do so due to time pressures, however, treating the contextual factors as such may mean information is missed as context may change over the course of an intervention (194), as was also described by Archer in pillar 2 (188).

Table 2 Ways in which contextual factors are differentiated, including an explanation, and how contextual factors were treated in this thesis (178).

Context as:	Explanation	Alternative:	Explanation	Treated in thesis as:
Dynamic	Factors may change shape during an evaluation, operating differently after change.	**Static**	Contextual factors considered to be moderating influences, no changes in factors taken into consideration during evaluation.	Static
Agentic	Factors may act independently of evaluated initiative and contribute to changes.	**Passive**	Changes in factors may be considered, but their role as contributing to changes is not considered.	Passive
Relational	Factors can influence elements of change processes, with or against the aims of intervention.	**Uniform**	Factors considered in relation to evaluation as a whole, independent of other factors.	Uniform
Immanent	Factors integrated with other factors through intervention, informing actions of participants	**External**	Factors operate separately from evaluation, acting as barrier or facilitator	External
Historically located	Factors considered in relation to long-term change processes	**Located in short term**	Factors considered in relation to the recent past and future	Located in short term
Complex	Factors may work in non-linear ways	**Simple**	Factors conceived of as working in linear ways	Simple

In this thesis I categorised contextual factors into the following four layers (187):

- Individual: the characteristics, capacities, and capabilities of key actors in the intervention, which may help to take the intervention forwards, e.g.., values, roles, knowledge and/or purpose.

- Interpersonal relations: characteristics of relationships among stakeholders, e.g.., communication, collaboration, and network among different actors.
- Institutional settings: rules, norms, and customs local to the intervention, e.g., informal rules, organisational culture, leadership, local priorities, and resource allocation.
- Infrastructure: the wider social, economic, and cultural setting of the intervention.

3.4 Mechanisms

Mechanisms are agents of change and describe how resources embedded in a particular intervention influence reasoning and, ultimately, behaviour of participants (187). Mechanisms generate patterns of behaviour. Interventions are often prolonged social encounters and even the simplest intervention can offer participants a considerable compass for decision making. A realist evaluator aims to identify the potential intervention mechanisms prior to implementation of the intervention. After implementation, the evaluator identifies whether previously identified, as well as unexpected mechanisms, disabled or circumvented the already existing mechanisms that were responsible for the pre-intervention situation (186). Apart from already present mechanisms, there are intervention mechanisms which can be described as intervention components, which introduce ideas and opportunities to intervention participants in the appropriate social conditions. Intervention mechanisms describe what it is about the intervention that brings about change (186).

Mechanisms are usually hidden, sensitive to variations in context and generate outcomes. Mechanisms have three attributes: 1) they reflect the embeddedness of the intervention within the stratified nature of social reality, i.e. what is it within a intervention that triggers a response from the participants depends on the social reality in which the intervention is implemented; 2) they take the form of propositions which will provide an account of processes, at various levels, that constitute the intervention, i.e. within an intervention there are various mechanisms occurring at one point in time; 3) they demonstrate how intervention outputs follow from the stakeholders' reasoning and capacity to put these into practice (186). Mechanisms thus impact participants' reasoning in response to introduced resources. For example, increased police patrolling (a resource) leads to increased trust and confidence of community members (reasoning), which in turn leads to increased surveillance and reporting of crime from community

members themselves (outcome), however the extent to which this occurs is dependent on the social reality in which police patrolling is introduced.

It is important to realise that a mechanism does not describe a causal relationship *per se*, but provides a theory which explains how human resources and reasoning can potentially lead to change and outcomes (195). Even if they are not triggered, mechanisms are still present. Mechanisms are the interaction between intervention resources and ways in which participants react and respond to them, thus providing an explanatory account of how and why interventions lead to outcomes (196).

3.5 Outcomes

Outcomes are generated through mechanisms acting in a certain context (outcome = mechanism + context). The outcomes regard the change in patterns, if any, due to the introduced intervention. To measure the change, it is important that outcomes are conceptualised carefully, with well thought-through indicators and established baselines, as interventions may change outcomes as intended, un-intended or not at all. Additionally, outcomes of the interventions itself may change the conditions in which the intervention takes place (as mentioned in pillar 2 above), including conditions that made the intervention work in the first place (187).

3.6 Context-Mechanism-Outcome Configurations

The contextual factors that trigger mechanisms, which in turn lead to certain outcomes, are collated into context-mechanism-outcome configurations or CMOCs. The CMOCs help in developing transferable and cumulative lessons. They are propositions stating what it is about a certain intervention that works for whom and in what circumstances. Throughout a realist evaluation process the CMOCs will be identified, articulated, tested and refined (186).

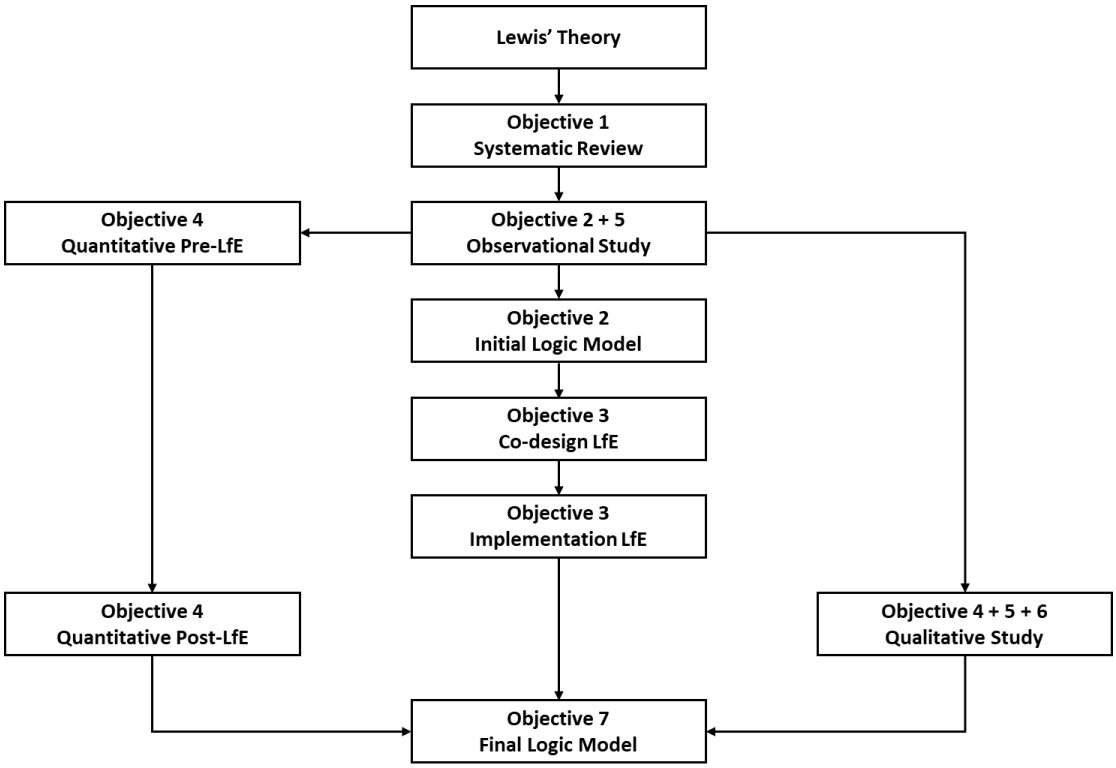
3.7 This Study

Figure 11 presents the different components of the study, as introduced in Chapter 1. For this thesis I used the theory as developed by Lewis, explaining how interventions using positive psychology (PP) can impact organisational performance, as the middle-range theory. With the help of the systematic review, as presented in Chapter 4, the middle-range theory was developed into a programme theory, explaining how interventions based on PP can impact performance of health personnel in any context. In the systematic review contextual factors, mechanisms of PP interventions and subsequent outcomes were identified, but, as will be explained in detail later, no CMOCs were

developed. In this thesis the programme theory, explaining how interventions will work, will be presented in the shape of a logic model. A logic model is a presentation of the programme theory in diagrammatical form, but, as opposed to a programme theory, the links in a logic model are not necessarily causal. Because the links between the various components of the logic models developed in this thesis have not yet been tested, and causality is thus unknown, I decided that explaining potential ways of impact and outcomes of LfE could be done with the help of a logic model (197).

The logic model developed in the systematic review in Chapter 4, was adapted to the context of CHWs in Neno District using insights from the observational study, as presented in Chapter 5. A logic model can be used to present contextual factors, (potential) mechanisms, and (potential) outcomes of LfE for CHWs in Neno District. The logic model can aid understanding of the various components of an intervention, including broader contextual factors, inputs, and activities, and how these are linked. A logic model was also used by Ebenso et al. for their realist evaluation of a CHW programme in Nigeria.

Figure 11 An overview of study objectives.



LfE = Learning from Excellence

Ebenso et al. mentioned that the creation of a logic model is an essential step in developing an empirically based and theoretically grounded model of complex relations between broader contexts, the intervention, and outcomes (197).

In the observational study, presented in Chapter 5, I developed CMOCs to explain how LfE can impact CHWs in Neno District. The developed CMOCs, together with identified themes based on observations and individual in-depth interviews, were subsequently integrated into the existing logic model, developed in the systematic review (Chapter 4). In the mixed method evaluation in Chapter 9, I identified additional contextual factors, mechanisms, and outcomes, which were integrated into CMOCs. The CMOCs were again used to refine the logic model as developed in the observational study in Chapter 5, explaining how LfE could impact CHWs in Neno District.

I chose to integrate the CMOCs into the logic model, as I believe the logic model could be a helpful tool for those considering the design and implementation of LfE. It provides a simplified, but complete overview of contextual factors that impact the implementation as well as uptake, potential mechanisms that are triggered by the implemented intervention and potential outcomes. I presented the CMOCs, to provide more detail about the individual mechanisms and in which contexts these were thought to occur. Particularly as limited information was available about the use of PP interventions in low-resource settings, as identified in the systematic review, the CMOCs could provide useful information about contexts and mechanisms specific to certain settings, and how these settings could impact mechanisms as well as outcomes.

3.8 Conclusion

I have presented an overview of the underlying theory upon which realist evaluation methodology is based. I have provided an explanation of contexts, mechanisms, and outcomes as well as how, in a realist evaluation, these are integrated into a context-mechanism-outcome configuration. Finally, I have provided a brief overview about what the use of realist evaluation means for the different studies presented in this thesis.

CHAPTER 4: OUTCOMES, MECHANISMS, AND CONTEXTUAL FACTORS OF POSITIVE PSYCHOLOGY INTERVENTIONS FOR HEALTH WORKERS: A SYSTEMATIC REVIEW OF GLOBAL EVIDENCE (198).

Maartje Kletter, Bronwyn Harris and Celia Brown

4.1 Introduction

In Chapter 1 I provided an overview of the role of Community Health Workers (CHWs), the factors that influence their performance and how interventions based on positive psychology (PP), like Learning from Excellence (LfE), could potentially impact performance. In Chapter 2, I provided background about Malawi and its health system, including more specifically what health programmes are run in Neno District, which stakeholders play a role in these programmes and how CHWs are involved in the various programmes and Chapter 3 provided more information about the research methodology that I am using in this thesis. In the current Chapter I will describe the systematic review that was conducted to develop a logic model, explaining how projects like LfE could impact health workers. This logic model acted as the starting point of my work with CHWs in Neno, Malawi.

This Chapter was published in Human Resources for Health in 2021, reproduced here with permission. I performed the searches, the screening of titles and abstracts, as well as full-text screening. To ensure consistency in inclusion of articles, BH and CB independently screened randomly selected titles and abstracts. I discussed uncertainties in the full-text screening with BH and CB. I extracted data and performed the coding and data analysis. Data synthesis was conducted in close collaboration with BH and CB. I drafted the paper and adapted according to advice given by BH and CB. Finally, I was responsible for the paper revisions, which were made in collaboration with BH and CB.

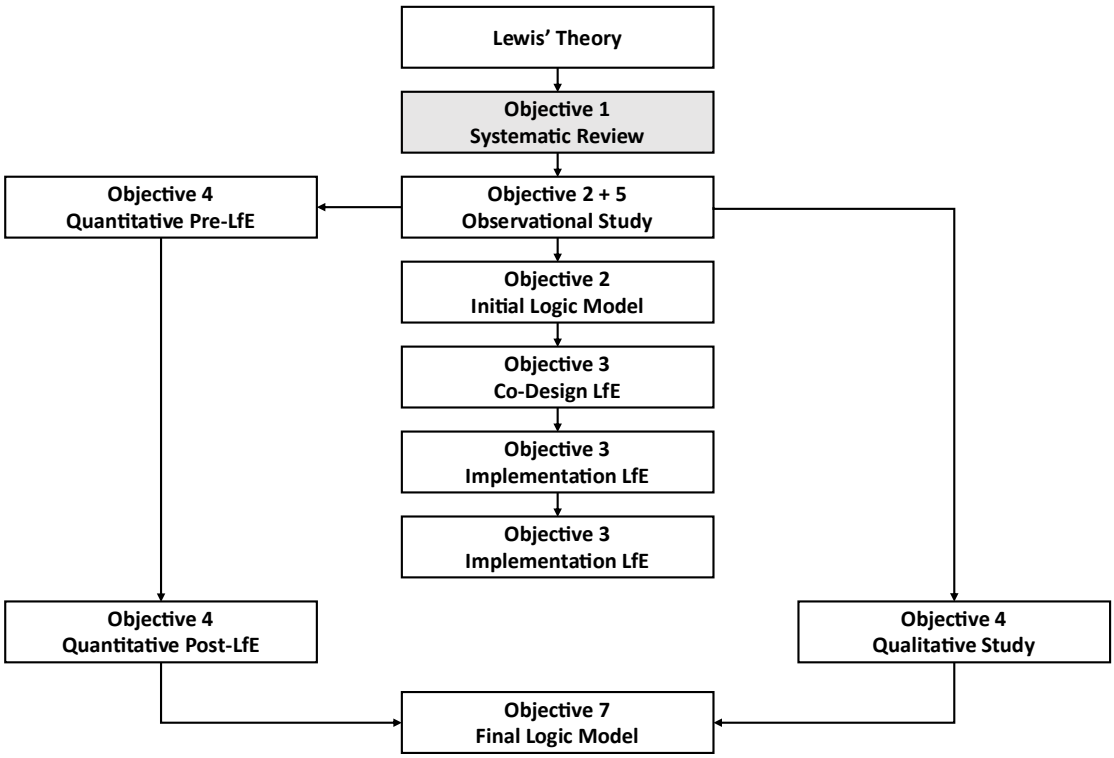
4.2 Aim

In this systematic review, using realist evaluation methodology, we aimed to identify the outcomes (including effectiveness), mechanisms, and contextual factors of interventions using PP for health personnel in global settings. We aimed to collate this evidence into a logic model to explain the impact of PP interventions on organisational

performance in healthcare. By going beyond "is it effective?" and including mechanisms and contextual factors in the logic model as well as outcomes, our work can support future designers, implementers and evaluators of PP interventions aimed at improving wellbeing and performance of healthcare personnel.

The logic model developed in this study acted as a starting point for the rest of this thesis, as shown in figure 12.

Figure 12 An overview of study components, with focus of this chapter coloured in grey.



LfE = Learning from Excellence

4.3 Methods

A protocol of this systematic review was published on Prospero on 19-12-2018 (PROSPERO 2018 CRD42018120114)(199).

We searched Web of Science, Medline, Psychinfo, Embase, Scopus and CINAHL from inception to 03-01-2019. Additionally, we hand-searched the references of included articles for other eligible studies.

To identify articles regarding the impact of PP interventions for health workers, we used the following search terms: health workers AND (positive psychology OR appreciative inquiry (AI)). The latter term, and its components, were included as AI is a type of PP intervention that we may not have picked up with just PP. Additionally we

searched for other terms that may describe PP interventions without the term PP being used: strengths or strength-based in proximity of feedback or coaching, positive in the proximity of coaching or feedback and excellence in the proximity of feedback. The full search strategy can be found in Appendix 1.

4.3.1 Study selection

Any study, of any design, that evaluated the impact of interventions informed by PP for any type of health worker (regardless of training, setting, gender or age), with any kind of outcome, was included. Interventions were determined to be informed by PP if they aimed to drive change or quality improvement based on positive qualities. If PP was described but not evaluated, or used as a research method only, the study was excluded. Studies that were not reported in English were also excluded.

Titles and abstracts were all screened by MK. Additionally CB and BH independently screened 100 randomly selected titles and abstracts, of which 25 were identical. Articles were randomly selected with the help of Excel random number generator; all articles were assigned a random number and the lowest 25 numbers were chosen for both CB and BH to screen. Two additional random numbers were assigned and again the 75 articles with the lowest numbers were assigned to CB and BH respectively. Disagreements regarding inclusion of the articles, at both the title and abstract screening and in the full-text screening, performed by MK, were resolved through discussion with all authors.

4.3.2 Data extraction

Extraction sheets were developed to extract information about the following: study details (i.e. year of publication, country, study design), setting, participants, intervention as per TiDIER checklist (200), method of evaluation, outcome measures and results. The TiDIER checklist was chosen for data extraction regarding the intervention as it guided us in collecting comparable components of PP interventions across studies. Our data synthesis was informed by realist evaluation methodology (186) which identifies outcomes (effects of the intervention), mechanisms (explaining processes through which outcomes are achieved) and contextual factors (conditions needed to trigger mechanisms that produce particular outcomes). Data were coded in nVivo, by MK. Only outcomes, mechanisms and contexts that were described as being present in the organisation in which the evaluation was implemented (i.e., not those hypothesised in

the article) were coded. All data were extracted by MK, checked by CB and BH, and discussed during face-to-face meetings.

4.3.3 Quality assessment

The quality of the included studies was assessed with the help of the SQUIRE checklist for quality improvement (QI) studies (201), as in healthcare settings PP is often intended for QI purposes. The SQUIRE checklist consists of five main categories. An included study was considered to be of high quality if out of the five SQUIRE checklist categories a maximum of two categories were considered to be of medium quality, with the other categories being of high quality. If three to five of the categories were considered to be of medium quality, with no category of low quality, the study was considered to be of medium quality. If one category was considered to be of low quality, and one category of medium quality, with the rest being of high quality, the study was considered to be of medium quality. In all other cases the study was considered to be of low quality. MK assessed the quality of the included studies, and this was checked by CB and BH.

4.3.4 Data analysis

Data were summarised for countries, interventions and type of health personnel/ward involved. Coded outcomes, mechanisms and contextual factors were grouped based on similarity in order to develop themes.

Due to differences in study designs and outcome measures, quantitative synthesis of quantitative outcomes was not possible. To enable synthesis of quantitative and qualitative outcomes together, identified outcomes were qualified as positive in quantitative findings if the assessed outcome showed statistically significant improvement and as positive in qualitative findings if an improvement in the outcome was described. Outcomes were qualified as neutral in quantitative findings if no statistically significant improvement or deterioration was present and as neutral in qualitative findings if no improvement or deterioration was described. Finally, outcomes were qualified as negative in quantitative outcomes if the outcome showed statistically significant deterioration and in qualitative outcomes if the outcome was described to deteriorate. Outcomes were clustered into larger groups based on similarity.

Mechanism themes were listed, including in which articles they were mentioned. Contextual themes, and in which articles they were mentioned were listed, as well as if they acted as facilitator or barrier for producing the intended outcome.

4.3.5 Data synthesis

We used Kneale et al.'s step-based method logic model development to synthesise our data (202). Kneale et al.'s method was chosen as it provides a structured way to develop a logic model, as part of a systematic review, which is what we aimed to do (202). The logic model depicts a chain of components representing mechanisms and contextual factors leading to outcomes. Presenting results in a logic model could develop a shared understanding of processes and underlying mechanisms for programme implementers, designers or evaluators (202).

Step one of Kneale et al.'s method regards the examination of existing theory or logic models explaining how PP interventions can impact organisational performance, including potential mechanisms, contextual factors and intermediate outcomes. We identified the theory by Lewis (203), which explains that PP interventions create an abundance culture through three key mechanisms: virtuous acts, affirmative bias and positive deviance. Virtuous acts are acts undertaken regardless of reciprocity whereas in organisations with affirmative bias strengths and possibilities are emphasised. Positive deviance in an organisation means there is a focus on creating an affluence of good. These three mechanisms help create an abundance culture, which is an essential element of organisations with exceptional organisational performance (123, 129).

Within the abundance culture, social capital is created as people are attracted to virtuous actors. Additionally, an affluence of good supports the creation of positive emotions and enhanced strengths (123). Positive emotions and enhanced strengths support the creation of resilience, as described by the broaden-and-build theory by Fredrickson (125), who proposes that when positive emotions are experienced and strengths are enhanced thought-action repertoires are broadened (127).

Step two of Kneale et al.'s method is the identification of the distal outcome, which for this study is organisational performance (202). Having identified an existing theory to use as a starting point for our logic model and our distal outcome, we could then proceed with integrating the evidence from the studies included in our review with the existing theory. We did this by comparing the details of the theory with the empirical evidence base in the stepwise process advocated by Kneale et al. For step three and four, intermediate outcomes as used in the studies included in our review were identified. Step four entails the identification of intermediate outputs, which are the direct focus for

modification within the activities of the intervention, but we did not distinguish these from outcomes (202).

Steps five and six are the identification of mechanisms and intervention inputs (contextual factors) in the studies respectively. Lewis' theory only includes mechanisms, explaining how the outcomes of a PP programme are achieved (123, 129). Because contextual factors impact the mechanisms, we planned to add these at the top of our logic model. We subcategorised contextual factors as follows (202, 204): factors before design and implementation of the intervention (factors present in the organisation that support enthusiasm for interventions), factors during the design (factors that support uptake of the intervention) and factors during the intervention itself (factors that support effectiveness of the intervention).

4.4 Results

Our search retrieved 4638 articles and identified another five articles through reference screening of included articles, as shown in figure 13. After removal of duplicates, 4228 articles were screened for title and abstract. We screened 152 full-text articles for eligibility and included 29 studies (31 articles). Articles were excluded at full-text screening for the following reasons: no evaluation of the intervention, (n=46), no positive psychology (n=32), no primary research (n=17), intervention not aimed at health personnel (n=14) and positive psychology as research method instead of intervention (n=12).

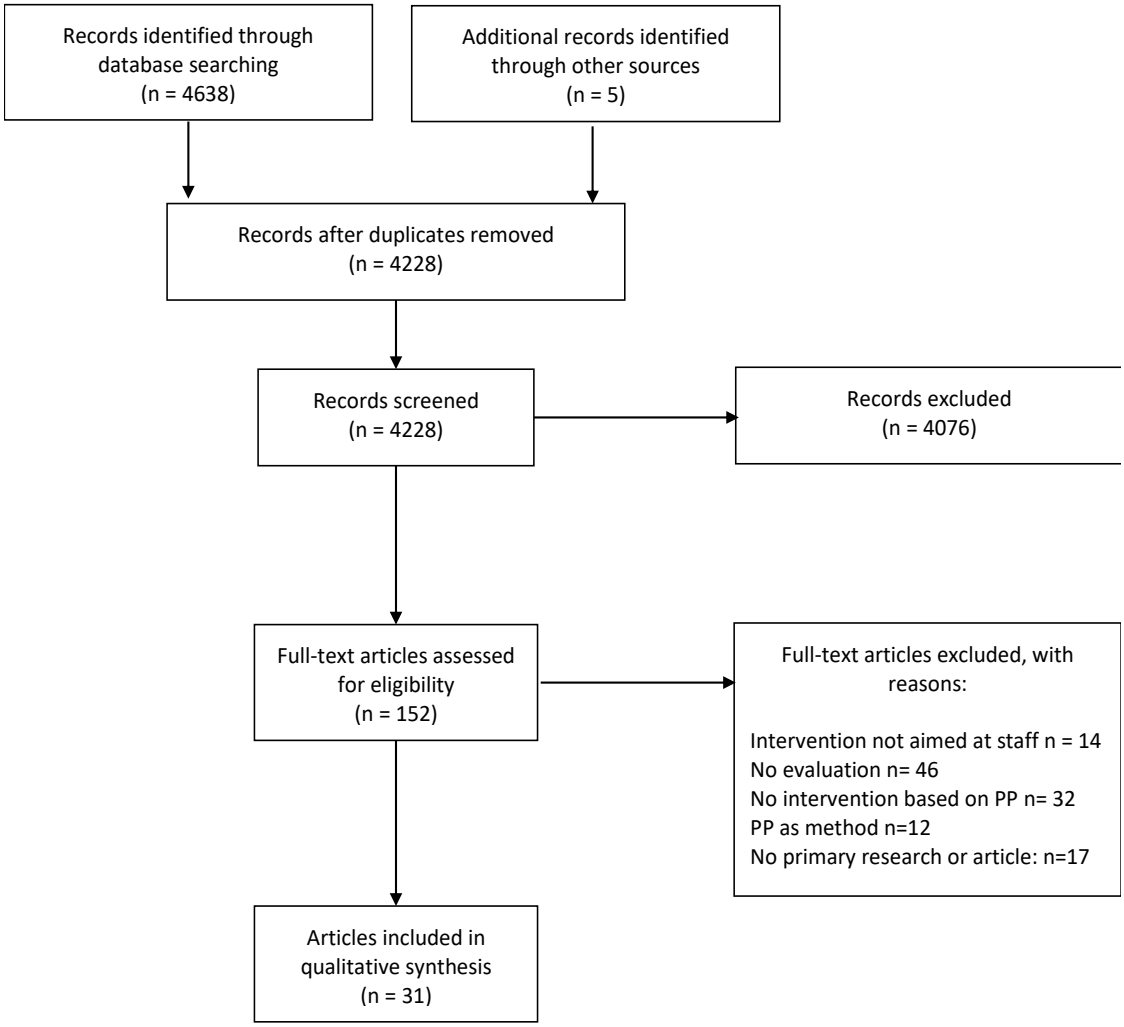
4.4.1 Quality appraisal

Most articles were of low quality (n= 19), six articles were of medium quality and six were deemed to be of high quality (Appendix 2). Articles scored particularly low on methods as there was little explanation about evaluation methods and reasons for choosing these methods.

4.4.2 Overview of included studies

An overview of extracted data is presented in Appendix 3. Most studies were published since 2014 (n=15). Only one article was published before 2007. Eight studies were conducted in the UK and seven in the USA. Others were performed in Canada (n=3), India (n=2), Australia (n=2), Belgium, China, Denmark, and The Netherlands (n=1 each). The majority of the interventions were implemented in secondary or higher, care settings (n=21), while other settings included an autism care organisation (n=3), care homes (n=2), primary care settings (n=2).

Figure 13 PRISMA flow diagram depicting the results of the literature search.



PP = Positive Psychology

A wide variety of health personnel, working in various wards and at different levels, were included in the interventions. The majority of studies included nurses or nursing managers (n=16). Allied health professions were included in nine studies and medical doctors in six. In four studies it wasn't clarified which professions were included. The exact place or whereabouts of the implementation of the intervention was rarely described. The most common department for implementation of an intervention was the emergency department (n=3). Other departments included gynaecology (n=1), internal medicine (n=1), radiology (n=1) and surgery (n=1).

We identified eight different types of interventions: appreciative inquiry interventions (n=12), staff training programmes (n=5), coaching programmes (n=4), a video feedback intervention (n=3), a workers' health surveillance module (n=1), Strengthoscope (n=1),

PROPEL (n=1) and an excellence reporting intervention (n=1). All interventions, except the workers' health surveillance module and the excellence reporting intervention, were delivered face-to-face. The duration and number of sessions of the interventions varied widely. For example for AI, one organisation held two sessions of 4.5 hours each (205), while in another three full-day sessions were held (206, 207).

The rationale behind the chosen interventions was their positive nature, which allowed participants to discover strengths and act as an alternative to negativity or weaknesses (n=13). Additionally, interventions were implemented to: reflect, create new perspectives and improve self-insight (n=5), increase levels of peer support and interaction (n=3), allow participants to be active agents in their own learning process (n=1), help participants to be more compassionate and nurturing with self (n=1), re-establish a sense of direction (n=1), and enhance personal resources (n=1). Finally, interventions were chosen due to the flexibility of intervention, focus on change and to overcome implementation barriers (n=3). There was no association between intervention type and rationale for use.

4.4.3 Outcomes

We identified 54 different outcomes in the included studies, as presented in table 3. Organisational performance was not mentioned as an outcome in any of the included studies. A wide variety of approaches to measurement of these outcomes were used across the studies, including self-report, individual in-depth interviews, and validated questionnaires (Appendix 3). Thirty-five outcomes were assessed quantitatively, 14 were assessed qualitatively and five were assessed both qualitatively and quantitatively. Out of the 40 quantitative outcomes there were seven with solely statistically significant positive outcomes and seven outcomes that were statistically significant in some studies, and neutral in others. Additionally, there were 25 outcomes that were neutral in all studies and one outcome that showed a neutral or negative outcome in all studies. Of the 14 qualitatively assessed outcomes, 12 were positive, one was neutral, and one was negative.

The most commonly mentioned outcome was wellbeing, which was mentioned in six studies, but never measured in the same way. Wellbeing showed a statistically significant improvement in only one article, the others showed neither improvement nor worsening. The interventions including wellbeing as outcome were a coaching programme (n=2), a staff training programme (n=3) and the 'Workers Health Surveillance Module'.

‘Positive mental health’ improved significantly in two interventions, the Workers’ Health Surveillance module and a Staff training programme.

‘Interaction and support’, which also showed improvement in a qualitative article, statistically improved in AI interventions (n=2), and a staff training programme. Other outcomes that showed statistically significant improvement, in one article each, were burnout, job satisfaction (in one of the four articles that assessed it), insight, motivation, proactivity, resilience, sick leave and work engagement. Additionally, insight, motivation and resilience also showed improvement in qualitative evaluations.

Self-reflection was assessed in three studies, one quantitative and two qualitative, looking at a coaching programme, a staff training programme and PROPEL. There were no statistically significant outcomes, but the qualitative article mentioned improvement. None of the articles looking at vacancy rates showed a significant change. Three articles, assessing AI, mentioned ‘improved connection to others’. Anxiety and depression were both assessed by two articles, but neither showed a statistically significant improvement.

Three outcomes showed a deterioration after the intervention: learning transfer, showing reduced readiness for transferring learning into practice (statistically significant), self-reflection, showing less self-reflection following the intervention (not statistically significant) and sustainable change (not statistically significant).

4.4.4 Mechanisms

We identified 49 different mechanisms as described in the included articles (see Appendix 4). While most mechanisms were only mentioned by one article (n=41), some were mentioned by multiple. ‘Recognizing and reframing negative interpretations’ was mentioned in five articles assessing a coaching programme (n=1), AI (n=3) and an excellence reporting intervention (n=1).

‘Sharing experiences and history’ and ‘time to reflect’ were both mentioned by four articles, assessing AI (n=4), and a coaching programme (n=1), AI (n=1) and video interaction guidance (n=2) respectively.

Table 3 Outcomes of interventionntions: + = positively impacted by intervention, - = negatively impacted by intervention, 0 = no change in outcome due to intervention.

		Intervention														Total			Total		
Cluster	Outcome	Appreciative Inquiry		Coaching programme		PROPEL		Staff training programme		Strengthoscope		Video Feedback Intervention		Workers' Health Surveillance Module		QUANT			QUAL		
		QUANT	QUAL	QUANT	QUAL	QUANT	QUAL	QUANT	QUAL	QUANT	QUAL	QUANT	QUAL	QUANT	QUAL	+	0	-	+	0	-
Attitudes as result of work	Job Satisfaction	Shendell-Falik (0)				Muha (0)		Guzman1 (0), Siu (+)								1	3				
	Morale		Dewar (+)																1		
	Motivation		Dematteo (+),	Yu (+)												1			1		
	Resilience			Gray (0)				van Agteren (+)								1	1				
	Trust		Ruhe (+)																1		
	Work Engagement					Muha (0)								Bolier (+)		1	1				
Attrition	Likelihood of leaving	Buck (0)															1				
	Retention					Muha (0)											1				
	Sick leave	Wright (+)*				Muha (0)										1	1				
	Turnover rates	Stefaniak (0)															1				
	Vacancy rates	Challis (0), Wright (0), Stefaniak (0)															3				
Burnout	Anxiety							van Agteren (0)						Bolier (0)			2				
	Burnout							Siu (+)*, Eastburg (0)								1	1				
	Depression							van Agteren (0)						Bolier (0)			2				
	Emotional Exhaustion			Palamara (0)													1				
	Stress							van Agteren (0), Siu (+) *								1	1				
Collaboration at work	Appreciation of Others									Macafee (+)									1		
	Awareness of Interactions											James1 (+)							1		
	Common Ground	Ruhe (+)														1					
	Connection to others		Ruhe (+), Dewar (+), Dematteo (+)																3		
	Interaction and support	Bergs (+)	Dewar (+)					Guzman1 (0/+)								2	1		1		
	Peer Cohesion							Eastburg (0)									1				
	Sense of Community	Buck (0)															1				
	Team Working	Sharma (+)							Guzman (+)							1			1		
Confidence	Confidence		Dewar (+)							Macafee (+)		Hall (+)							3		
	Personal Accomplishment				Palamara (0)															1	
	Self-realisation				Ammentorp (+)														1		
	Sense of Competence							Guzman1 (0)									1				
Information	Quality of information	Bergs (0)															1				
	Relevance of information	Bergs (0)															1				
Knowledge & personal skills	Knowledge		Dewar (+)													1			1		
	Learning Transfer							Guzman1 (0/-)									1	1			
	Insight		Ruhe (+)	Yu (+)	Ammentorp (+)							James (+)				1			3		
	Self-Reflection			Yu (0)						Macafee (+/-)		James (+)				1			2		1
Positive emotions	Celebration		Dewar (+)																1		
	Fun								Guzman (+)										1		
	Happiness							Guzman1 (0)									1				
	Positive Mental Health							Siu (+)						Bolier (+)		2					
	Well being			Gray (+), Yu (0)				Austin (0), Guzman (0), van Agteren (0)						Bolier (0)		1	5				
Server user perspective	Patient Satisfaction	Shendell-Falik (0)				Muha (0)											2				
	Service User Perspective											James (+), James1 (+)							2		
Supervision and Management	Management Processes	Sharma (0)															1				
	Manager satisfaction	Stefaniak (0)															1				
	Supervisor Support							Eastburg (0)									1				
Work practices	Approaches to Dementia							Guzman1 (0)									1				
	Behaviour change		Dematteo (+)																1		
	Cleanliness	Sharma (0)															1				
	Compliance with guidelines	Shendell-Falik (0)															1				
	Infection Control Practices		Sharma (0)																	1	
	Nutritional Assessment	Shendell-Falik (0)															1				
	Preventive Service Delivery	Ruhe (0)															1				
	Proactivity			Yu (+)												1					
	Puerperal Infection	Hussein (0)															1				
	Sustainable change		Dematteo (-)																		1
TOTAL	+	3	12	4	1	0	0	7	2	3	0	0	6	2	2	18			25		
	0	18	0	4	1	5	0	15	0	0	0	0	0	3	3		43			2	
	-	0	1	0	0	0	0	1	0	1	0	0	0	0	0			1			2

‘Increased awareness’ was mentioned in three articles assessing video interaction guidance (n=2) and AI (n=1). Finally, ‘sense of community’, ‘recognition of experts in own context and as members of team’, ‘focus on creativity, mutual respect and relationship building’, and ‘breaking down interprofessional hierarchies’ were each mentioned by two articles.

4.4.5 Contextual factors

We identified 24 contextual factors of which seven were mentioned in more than one article (see Appendix 5). There were seven factors that acted as barriers, while the other 17 acted as facilitators. The facilitator that was most often mentioned, in eight articles, was ‘managerial support’. Other frequently mentioned facilitating contextual factors were ‘no professional relationship between coach/trainer and participant’ and ‘positivity welcome contrast to problem-based approach’, which were both mentioned by three studies. ‘Champion commitment’ and ‘online interventions that are accessible and affordable’ were facilitating contextual factors mentioned by two studies. Finally, three studies mentioned ‘stressful work environments’ and ‘history of failed interventions’ as barriers to implementation. Contextual factors were split into three categories relating to timing, as described in the methods section, and shown in table 4.

4.4.6 Logic Model

The developed logic model is presented in figure 14, which is the integration of Lewis’ theory with the results of this review as described above. Figure 14 is based on Lewis’ theory, but specific for PP interventions in healthcare organisations. The figure is based on available evidence and, unlike figure 11, includes contextual factors as well as additional mechanisms and intermediate outcomes. With the help of the logic model we aimed to provide a more simplified overview of our findings as identified outcomes as well as mechanisms varied widely among the included studies.

Contextual factors were added at the top of the logic model as they act as intervention inputs. To simplify the model contextual factors were listed as category. The contents of each category can be found in table 4.

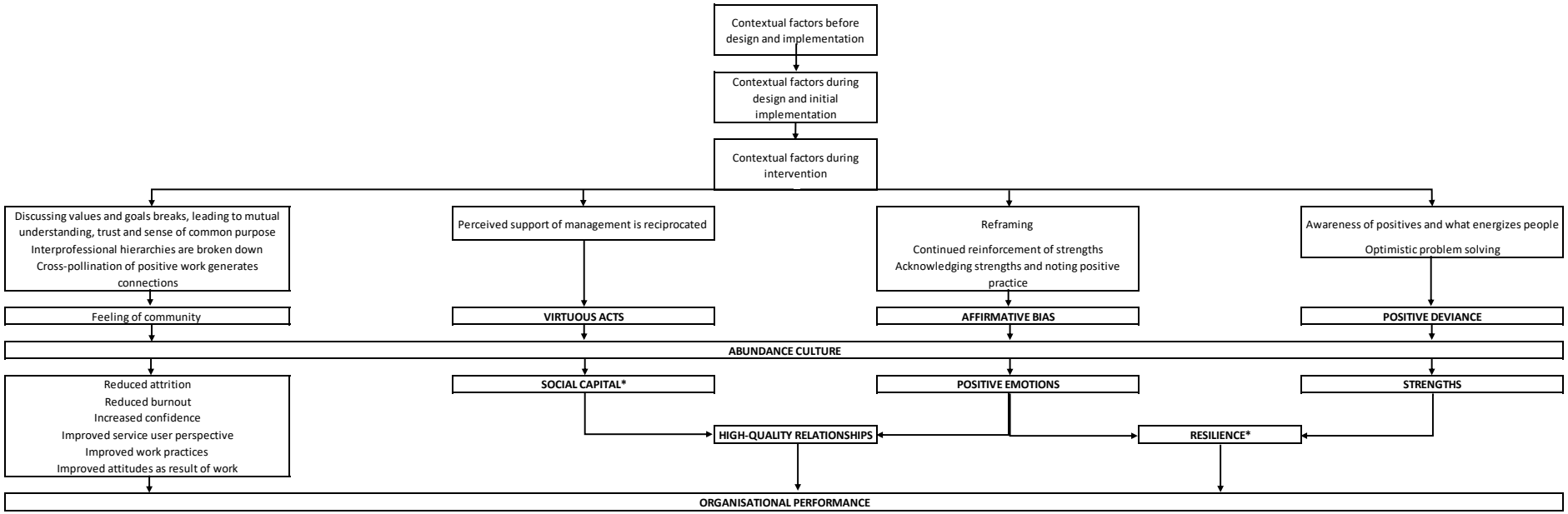
Table 4 Overview of contextual factors.

Category	Contextual Factor
Before design and implementation of intervention	Trust in management Sufficiently high morale Sufficient human resources Personnel receptive to change Perceived need for intervention Human potential maximised in organisation Past successes
During design and initial implementation of intervention	Leadership buy-in Clear communication about intervention Buy-in from participants Champion commitment Safe environment for intervention Nature of intervention doable with existing time pressures Nature of intervention aligns with personality participants Support from external organisation
During intervention	Compassionate, authentic, and optimistic coach/trainer Adequate durations of sessions and session intervals Sufficient access to intervention Reminders to those who have not yet participated Regular reinforcement during training Diversity encouraged

Once contextual inputs were identified we looked at the mechanisms, in figure 13 called intervention processes, which explain how the intervention leads to an abundance culture, through which outcomes are achieved. There were three main mechanisms present in Lewis' theory: virtuous acts, affirmative bias, and positive deviance. We identified processes that link the contextual inputs to the realisation of these three mechanisms. For example, reframing from negatives to positives supports affirmative bias. Additionally, a focus on optimistic problem-solving feeds into positive deviance. We also identified a fourth mechanism, the feeling of community. The processes that feed into the feeling of community are the breakdown of interprofessional hierarchies and discussing values and goals with colleagues.

Through the abundance culture post-immediate outcomes are created, which are expected to lead to improved organisational performance. We included clustered outcomes, as presented in table 3, which had at least one positive quantitative or qualitative outcome.

Figure 14 Theory explaining the impact of positive psychology interventions on organisational performance for healthcare personnel.



CAPITAL = Components from Lewis' theory.

Lewis' theory included five outcomes: social capital, positive emotions, strengths, high-quality relationships, and resilience. We did not identify social capital or resilience, possibly due to absence of evidence. As they were part of the original theory, we did include them in figure 14. We did identify positive emotions, strengths (improved knowledge and personal skills), and high-quality relationships (improved collaboration at work). Other examples of outcomes were reduced attrition, reduced burnout, increased confidence and increased positive emotions.

4.5 Discussion

While organisational performance was not measured in any of the 29 included studies, with the help of Lewis' theory for impact of PP interventions, we developed a logic model explaining how PP interventions can impact organisational performance in healthcare settings. The recent growth in reported use of PP interventions, with almost half of the included articles published in the last five years, indicates a need for understanding of how and why these interventions could be effective, and what potential facilitators and barriers implementers should be aware of; a need which we have aimed to address in this study. We included both quantitative and qualitative studies in our systematic review, to provide an overview of intended outcomes and perceptions of the evaluated interventions. Interventions were mainly implemented in secondary or higher services in developed countries, although two of the included studies were conducted in India and China (206-208).

While the logic model is a simplified version of reality, we believe it contains a wealth of information for those developing, implementing, and evaluating PP interventions in healthcare settings. For example, to aid the identification of contextual factors that are important to consider before and during design as well as during a PP implementation; and to guide monitoring and evaluation of the impact of PP interventions in healthcare organisations with the many potentially measurable intermediate outcomes that we have identified. Furthermore, our logic model can guide future research, including study methodology, into the impact of PP on organisational performance in healthcare organisations, for example by providing a list of mechanisms to look for. The logic model is generalised, rather than being specific to a particular setting. Implementers should therefore consider the elements of the model alongside their own knowledge of their local setting when using it to guide design, implementation, and evaluation of PP interventions.

Because interventions and outcome measures varied widely, it was difficult to compare them. Due to small samples sizes and low quality of included studies it was difficult to determine the impact of PP interventions on health personnel. Less than half (n=14) of the quantitatively assessed outcomes showed statistically significantly improvements in at least some of the articles in which they were assessed. Additionally, there were only two outcomes that showed statistically significant improvement in more than one article: 'interaction and support' (205, 209) and 'positive mental health' (208, 210). It is noteworthy that qualitatively assessed findings were more likely to be positive than quantitatively assessed ones.

The mechanisms we identified also varied and only a few were mentioned in more than one study, although this does not imply that they were not present in studies where they were not reported. The most commonly mentioned mechanism was 'recognising and reframing negative interpretations'(211-215), which seems important in healthcare, where there is a lot of emphasis on negativity as preventing adverse events is often prioritised. Two mechanisms were mentioned in four articles: 'sharing experiences and history' (213, 215-217) and 'time to reflect' (215, 218-220) . The PP interventions brought people from different wards, departments, and jobs together, which helped break down barriers and allowed staff to learn from each other. In the day-to-day job of health professionals there seems to be little time to reflect upon practices, particularly on what went well (221, 222) whereas the PP interventions created time to reflect, which was valued.

We identified several contextual factors that are important for achieving impact of a PP intervention. It was considered important that the coach or trainer facilitating the intervention had no professional relationship with the participants (218). Interventions were hampered by stressful work environments (223), which are common in healthcare, and a history of failed projects (223). In some studies scepticism regarding the intervention was mentioned as there was uncertainty if momentum could be sustained or if there would be sufficient support from management to keep the intervention going (215, 224). Lack of support means the intervention is not being used or not being taken forward, which is a demotivating factor for health personnel.

Our study has several limitations. Only a few mechanisms were described in the included studies, which leads us to believe there are additional hidden mechanisms. Due

to wide variation in impact assessments in the included studies, as well as the interventions themselves, we were unable to compare findings across different settings. Moreover, we did not check grey literature, where there may be relevant articles regarding evaluations of interventions using positive psychology. Furthermore, the quality of included articles is low, in particular the methods used for evaluation of interventions were of substandard quality, making it difficult to determine the actual impact of the assessed interventions.

4.6 Conclusion

Now, more than ever, new strategies are needed to support and retain the health workforce. Our systematic review has shown that while outcomes of PP intervention for health personnel varied widely, and few outcomes were statistically significant, possibly due to absence of evidence, trends in both the quantitative articles and the qualitative outcomes show that positive mental health, interaction and support and wellbeing of health personnel increased through participation in PP interventions. We developed a logic model explaining how PP interventions can impact organisational performance, as well as intermediate outcomes, including wellbeing, of healthcare personnel. This logic model could support designers, implementers, and evaluators of PP interventions in healthcare. However, more research about the impact of interventions using positive psychology is needed, in particular to determine impact quantitatively. Future research should focus on making mechanisms of interventions using PP more explicit.

CHAPTER 5: INTERVIEWS AND OBSERVATIONS IN NENO DISTRICT.

5.1 Introduction

In Chapter 4, I presented a systematic review, aimed at identifying how interventions like LfE could potentially impact performance of health workers, including a logic model that explains mechanisms and contextual factors that play a role in achieving impact. In the systematic review, we recommended that the logic model could be used by designers and implementers but would have to be adapted to suit the local context, which is what I aim to do in the current chapter. I will first introduce the specific objectives of the observational study that is presented here and explain how these fit with the wider aims of the study. I will explain the research methods I have used, before presenting and discussing the results. The output of this observational study has informed the co-design process and implementation, as described in Chapters 6 and 7 as well as the mixed method evaluation, described in Chapter 9.

5.2 Aim

The aim of this study was to adapt the logic model as designed in the systematic LfE intervention for CHWs in Neno District (objective 2), as well as to assess contextual factors that trigger the identified mechanisms, leading to potential outcomes (objective 2 and 5) of a co-designed 'Learning from Excellence' intervention (Figure 15).

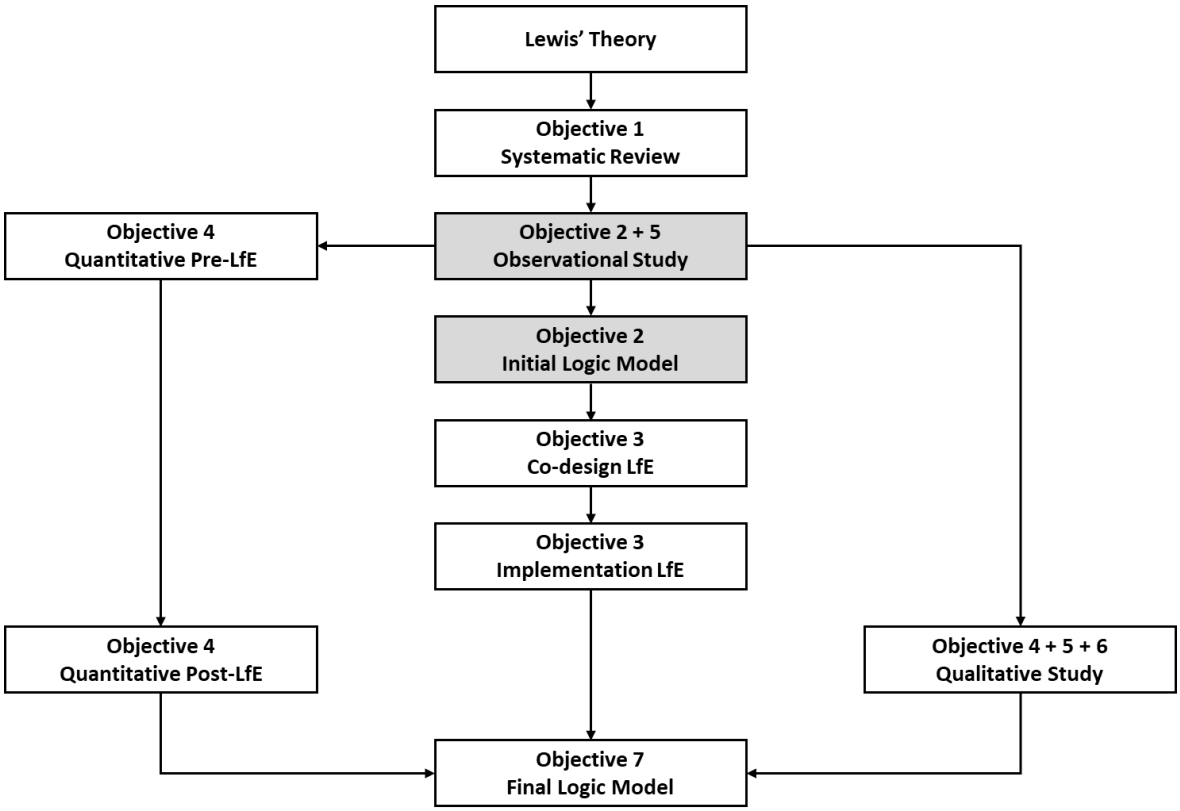
The results of this study informed the co-design process, as I took the contextual factors identified in this study into account during design and implementation of the LfE intervention in Neno District. The logic model that was developed in this Chapter did not only inform how LfE could impact outcomes of the CHW programme, but also identified various non-LfE related factors that could potentially be impacted by LfE. Furthermore, the results informed methods used in the mixed method evaluation study as presented in Chapter 9.

5.3 Methods

The observational study consists of two parts: 1) observations of CHWs and Senior CHWs (SCHWs) during monthly household and quarterly supervision visits and 2) in-depth individual interviews with key stakeholders in the CHW programme in Neno District. Observations were chosen as research method, as shadowing a CHW or SCHW allowed me to get personally immersed into the daily activities undertaken by

CHWs as well as the context in which these are undertaken, instead of only focusing on the structural elements of CHW programmes (225, 226). Anthropologists have highlighted the importance of describing experiences on the ground to contribute to understanding about these experiences and I hoped observations would allow me to do this (225, 226).

Figure 15 An overview of study components, with focus of this chapter coloured in grey.



LfE = Learning from Excellence

Individual in-depth interviews with stakeholders were chosen to gather insight into the CHW programme, including its strengths and weaknesses, as well as the potential impact LfE could have. Individual interviews were chosen as I hoped this would allow the various stakeholders to speak freely without others who are involved in the programme present. I performed a thematic analysis and, with the help of context-mechanism-outcome configurations, as per realist evaluation methodology (Chapter 3), data were synthesised into a logic model explaining how LfE could impact performance of CHWs in Neno District.

5.3.1 Setting

A detailed description of Neno District has been provided in Chapter 2. Neno District is divided into two administrative sites: upper Neno, which refers to the more mountainous area near the Mozambican border, and lower Neno, which refers to the flatter area near the tarmac road to Blantyre. Observations were performed of CHWs working in the catchment areas of two of the 14 health facilities in Neno District, both located in upper Neno: Site F and Site G. These sites were chosen as the CHWs and SCHWs working at these sites use a mobile health (mHealth) application, introduced in July 2019, to register household and supervision visits. PIH aims to roll out the mHealth application in the 12 other sites as well. PIH and I aimed to integrate the LfE intervention within the mHealth application to allow CHWs to fill in an excellence form on the spot, as they carry their phone with them all the time as opposed to paper-based forms in health facilities, which may not be visited on a regular basis. One of the outcomes of the exploratory evaluation of LfE in National Health Service (NHS) trusts in the United Kingdom (UK) was that it was easier to fill in an excellence form if this could be done on the spot (15). Observing how the mHealth application is used in practice would have informed the design as well as the implementation of the LfE intervention (however, due to COVID-19 pandemic LfE was never integrated into the mHealth application, as will be described in more detail in Chapter 7).

The mHealth application contains data of all households and household members. Screening for the monthly household visits is standardised and CHWs have to fill in all the answers to screening questions before they are able to submit the form. When particular answers to screening questions are given, CHWs are prompted to refer household members to the health facility. Once the form is saved, data is immediately transferred to the Monitoring and Evaluation (M&E) team, where data from all PIH programmes is collected, analysed, and shared with programme managers and the Ministry of Health (MOH) in Neno District.

5.3.2 Data collection

5.3.2.1 Sampling

The CHW Programme Officer for upper Neno selected CHWs for participation in the observational study, based on their experience as CHW Programme Officer. They took the following variables into account: gender, age, years working as CHW, performance and education levels. I retrospectively looked how these factors might impact

CHW motivation and/or performance by considering a systematic review by Kok et al., which aimed to identify factors impacting CHW performance (58). The authors identified that performance regarding specific tasks, like record keeping or counselling could differ between male and female CHWs. More years of education was generally associated with higher performance, but there was a mixed picture regarding years of experience or age and CHW performance. No difference in job satisfaction was identified for any of these CHW characteristics (58). There is concordance between the criteria investigated in the systematic review as impacting CHW performance, and the experience-based criteria applied by the CHW Programme Officer. The selection made by the CHW Programme Officer allowed me to observe CHWs with potentially varying levels of performance.

5.3.2.2 Participants

Participants for the observational study were selected and contacted by the CHW Programme Officer for upper Neno. CHWs were included based on availability and willingness to participate.

At each site two CHWs and two SCHWs were invited to participate. As CHW tasks are the same in the entire district, I believed that observing four CHWs and four SCHWs would provide me with sufficient information about the proceedings of a household or supervision visit.

Stakeholders for the in-depth interviews were selected based on their involvement in the CHW programme in Neno District. Participants were selected by me, the Chief Medical Officer (CMO) and the Community Health Director (CHD). Selection was done based on the role of the participant in the CHW programme itself or based on how often stakeholders interacted with CHWs due to the nature of their job. Participants from both PIH and MOH were invited.

5.3.2.3 Data collection

Observational data were collected between January 8th and January 17th, 2020. I shadowed the CHWs and SCHWs as I wanted to get an overview of both the monthly household visits, as well as the supervision visits that are performed in the CHW programme in Neno District. As Chichewa was spoken during the household visits, I was accompanied by a research assistant (RA), who translated household visits on the spot. The RA did not work for PIH at the time of the observations and was employed to support this study. The RA was also involved in implementation and evaluation of the

LfE programme. As planned, I observed four SCHWs, two at each site, and four CHWs, again two at each site. During the observations the observed CHWs performed a monthly screening and the SCHWs performed the third supervision visit, which entails an 'on-the-spot check'. Both types of visits are further described in Chapter 2.

The Site Supervisor for Site F was present during two observations. They introduced themselves, the RA and me to the observed CHW, as well as to the household members. In absence of the Site Supervisor or CHW Programme Officer the RA explained the research project to the household members. The Site Supervisor for Site G, who is supervising CHWs and SCHWs and informs the CHW Programme Officer of findings, was present during all the observations in Site G. The Site Supervisor started the household visits by introducing themselves, the RA and myself to the household members and they explained the research project to them. The CHW Programme Officer was present during two observations in Site G and one observation in Site F. Informed consent was obtained from the CHWs and SCHWs. Additionally verbal permission was sought from the household members, as guided by PIH. An overview of the participant-information leaflets and consent forms used in this study can be found in Appendix 6.

CHWs are volunteers and perform their duties as CHW, like monthly screening visits or accompaniment of patients to the health facility, alongside their duties at home, and they can decide themselves, in discussion with their clients, when to work. To obtain an overview of different activities on different days, participants were shadowed for one part of the day, i.e., morning or afternoon, for as long as they were conducting their duties as a CHW.

I took the role of 'complete observer' during the observations, meaning that I stood back and listened to the proceedings (227). The RA in turn took more of a participant-as-observer role and occasionally asked clarifying questions regarding the proceedings (227). During the observations I took notes of the different components of the CHW and SCHW visits: introduction, education, screening, referral, and wrap-up as well as tools used during the visit. I took notes about the overall setting: location of the house, where the visit took place (e.g., inside the house, on the front porch etc.), the weather, the household members present, non-household members present, the general atmosphere and any questions or comments made by the household members. Finally, notes

were taken about interactions with the CHW/SCHW and the household members as well as with each other (228).

After the visits for the day had finished, the RA and I wrote down some reflections. The observation notes, including reflections upon the visits by me and the RA were written up in MS Word and pseudonymised. When all observations had been performed, I reflected upon them and wrote down an additional reflection for each observation. Further notes were taken based on various informal conversations with the stakeholders. Table 5 provides an overview of the different note-taking processes.

Table 5 Overview of note-taking process during observational study.

Notes	Example
Various components of visit	"CHW starts education about TB. To do so they use a placard with a photo of a very thin man. "
Equipment, including tools, used during visit	"CHW has bag, carries phone in hand, and an umbrella."
Environment, including weather and household members present	"We walk past some houses to a house that is a little bit separated from the main village."
Initial reflection MK	"The SCHW was very active in encouraging clients to trust CHW and to go to them with any questions regarding their health."
Reflection RA	"The SCHW was polite to the client, hence the client was free and flexible to answer their questions. "
Final reflection MK	"This observation was a good example of how the mHealth application can be used."

CHW = Community Health Worker
mHealth = Mobile Health
RA = Research Assistant
SCHW = Senior Community Health Worker
TB = Tuberculosis

To support the observation notes, I took photos during the observation visits. Photos can help to help avoid potential misconceptions of the context and create greater understanding of the program location and resources (229). I took photos of places where the CHWs and SCHWs work, including the general setting and the tools that are necessary for carrying out the job, including modes of transport. I did not use any filters and photos were not edited. Participants were not asked to model or change their position for the photos and no photos were taken of recognisable people; when CHWs or SCHWs were photographed this was from the back or without their face. No houses or household members were photographed. Informed consent was obtained from CHWs and SCHWs. Photos were taken with a digital camera and stored on a protected file on the password protected W-CAHRD server of the University of Warwick.

After I had been introduced to the various selected stakeholders by a PIH staff member, I invited stakeholders to participate in the interviews via email. Interviews were held in English, between the 14th of January 14 and the 28th off January 2020 in quiet rooms at either the PIH Office or the District Hospital in Neno Town. Informed consent was obtained and interviews were recorded with permission of the participants (230).

During the interviews the following topics were discussed (a full interview guide can be found in Appendix 7) (230):

- Current CHW programme and supervision processes, including strengths and weaknesses.
- MHealth application to date, including strengths and weaknesses.
- Initial ideas regarding the LfE intervention.
- Expected outcomes of the LfE intervention.
- Expected mechanisms, acting as either facilitator or barrier, of the LfE intervention.
- Expected contextual factors, acting as either facilitator or barrier, which could impact mechanisms and outcomes of the LfE intervention.

5.3.3 Data analysis

I performed a thematic analysis of the data (231). It should be noted that I coded both the observations and the interviews, which may have affected the coding process. Coding the observations led to an awareness about potential themes, which may have impacted the coding of the interviews.

First I familiarised myself with the data (231). To do so I collated all observation notes into one file. To identify the standardised components of the household visit I looked at the mHealth application, which included standardised forms for household visits, and compared the household visit forms with notes taken by me and the RA. After I familiarised myself with the data, I noticed that the observations all had clear patterns in terms of aspects discussed. I thus developed the following codes, which allowed me to get an overview of the differences as well as similarities among different aspects of the visits performed by the observed CHWs or SCHWs: introduction, education, screening CHW, screening SCHW, referral, wrap-up of visit, household members,

tools, weather, location, atmosphere, questions of household members and miscellaneous (i.e., unanticipated things that came up during the visits). For each photo I wrote a description about what was shown in the photo. These descriptions were subsequently added to the observation notes.

I transcribed the interviews verbatim and performed initial open line-by-line coding on paper (231). I chose to do this as I find reading on paper easier than reading from a screen. While coding on paper I became more familiar with my data (231). If lines contained multiple topics, multiple codes were generated. Initially, as to integrate data easily, I tried using the same coding as for the observational aspect of this study, but this was not possible because the topics discussed in the interviews did not converge with the topics of the observed visits. To structure the coding process I then used 'The Coding Manual for Qualitative Researchers' by Johnny Saldana (232). I used a*ttribute coding* to describe the roles of the stakeholders and the different aspects of the community health programmes, including the monthly household visit, supervision visit and other community health programmes. To learn more about strengths and weaknesses of the different programmes run by PIH in Neno District and the LfE intervention, I used *evaluation coding*, labelling the specific strengths and weaknesses brought forward by participants, regarding, for example, the CHW programme and LfE. Within the codes I used *sub-coding* to provide further detail. Finally, I used *structural coding,* where data is labelled and categorised, allowing me to access it quickly during further analysis. An example of a structural code would be 'strength CHW programme' (232). I subsequently coded the interviews in nVivo and, to ensure consistency, BH independently coded the first five interviews. BH and I then discussed our coding and identified similarities and resolved differences.

Once coding was done, I organised codes into sub-themes based on similarity (231). Sub-themes were subsequently organised into themes, again based on similarity. For example: the code 'supplies and resources are a challenge' was considered part of the sub-theme 'not enough funding' together with the code 'lack of resources. This sub-theme was part of the 'resources' theme. The developed themes and sub-themes were recorded in Excel and CB checked the sub-themes and themes for consistency and added comments when they disagreed with my choices. CB and I then discussed all identified themes with BH, and the themes for which CB added comments in particular, and further refined the themes to ensure their quality and representation of data

(231, 233). For codes that could potentially fit into different sub-themes, and sub-themes that could fit into various themes I decided for one specific sub-theme or theme respectively, which was discussed with BH.

After themes were developed, I identified context-mechanism-outcome configurations (CMOCs), as explained in Chapter 3. The CMOCs helped me understand links between context, mechanisms, and outcomes, which aided in development of the logic model. The configurations were initially written on paper. I then collated them based on similarity, added them into an Excel file and subsequently collated them even further. The contextual factors were organised into the following categories, as explained in Chapter 3: individual, interpersonal, institutional, and infrastructural and a table with an overview of the identified CMOCs was made. I distinguished between negative and positive outcomes.

5.3.4 Data synthesis

Themes as identified in the interviews were compared with themes as identified in observational notes and memos. Where themes were convergent, they were merged into a bigger theme but if they were divergent separate themes were created.

Apart from the development of themes, data were triangulated with the help of the identified CMOCs for the interviews: evidence from the observations, including photos and memos, was compared with the contextual factors and mechanisms (no outcomes were identified) of the developed CMOCs and converging and diverging contextual factors, and mechanisms were identified. If the observational data converged with a CMOC it was integrated into the CMOc, however if it diverged from a specific CMOC, an additional CMOC was developed.

All data from themes, but particularly CMOCs were integrated into a logic model to explain how LfE could potentially impact organisational performance of CHWs in Neno District, Malawi. The themes and CMOCs were compared with the logic model as developed in the systematic review, which is described in Chapter 4. Because contextual factors impact the mechanisms, we planned to add these at the top of our logic model. As in the systematic review, contextual factors were again subcategorised as follows (202, 204): factors before design and implementation of the intervention (factors present in the organisation that support enthusiasm for interventions), factors during the design (factors that support uptake of the intervention) and factors during the

intervention itself (factors that support effectiveness of the intervention).The logic model was adapted to include newly identified factors.

5.4 Results

5.4.1 Participants

Eight observations took place. Three of the four observed CHWs were female and one of the four SCHWs was female. In Site G I performed two observations per day because due to bad road conditions and the rainy season it was not possible to travel to Site G often. Site G was located about 1.5 hours from Neno Town, where I was staying and we had to return in time to make it back before it started to rain, and roads got too muddy. In Site F one observation per day was performed. Of the four observations in Site F, two took place on a morning and two took place on an afternoon.

During the CHW observations six monthly household visits took place and during one of these visits I also observed a daily check-up of a newly identified HIV-patient. Monthly CHW visits lasted between 11 and 55 minutes and took a mean of 32 minutes (I forgot to record the duration of the first observation). Furthermore, the four SCHWs performed seven supervision visits of five CHWs. Supervision visits lasted between 9 and 20 minutes.

Fourteen stakeholders in the CHW programme in Neno District were invited to participate in the interviews and 12 stakeholders participated. Two stakeholders were unable to take part as they were busy, or unable to travel to Neno District due to rainfall and bad road conditions. The stakeholders were involved in the CHW programme, the Integrated Chronic Community Care (IC3) programme, the Primary Healthcare Programme, and the Community Health Programme of the Ministry of Health. In Chapter 2 information about these different programmes, including the role of CHWs in them is provided.

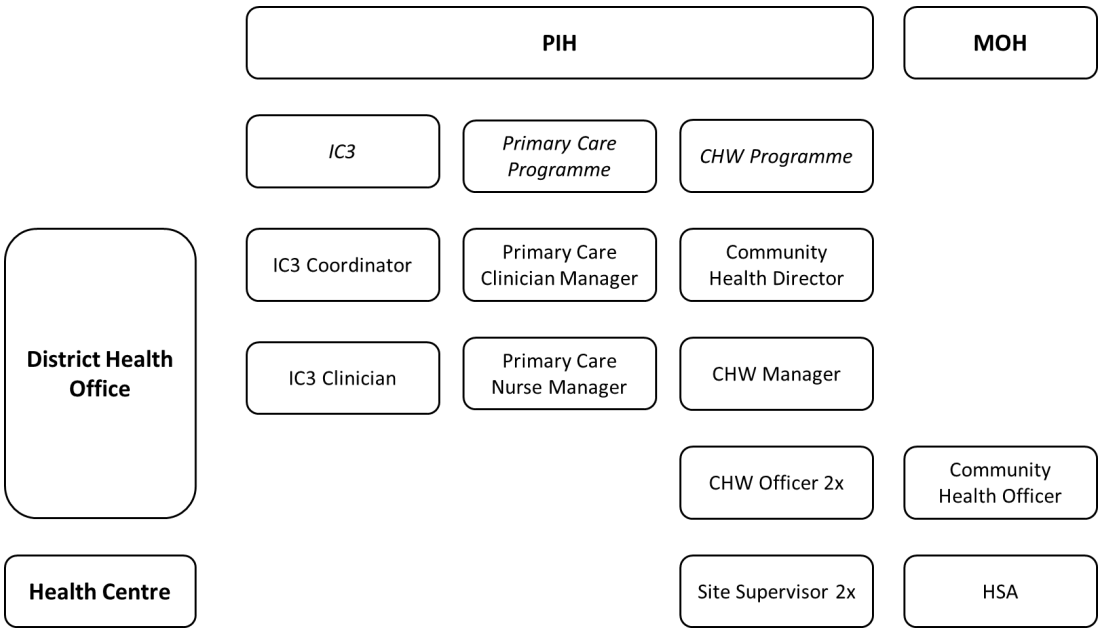
The following stakeholders from PIH participated: CHD, CHW Programme Manager, CHW Programme Officer for upper Neno, CHW Programme Officer for lower Neno, Site Supervisor for Site G, Site Supervisor for Site F, Primary Care Clinician Manager, Primary Care Nurse Manager, IC3 Clinician and IC3 coordinator. Two stakeholders were involved in the community health programme of the MOH: Community Health Director and Senior Health Surveillance Assistant (HSA). An overview of these roles within the CHW programme can be found in figure 16. Interviews took a mean of 27

minutes, with the shortest interview taking only 13 minutes, while the longest took 53 minutes.

5.4.2 Themes

Seven themes were identified. Six of these themes concerned the CHW programme as implemented by PIH and one theme concerned LfE directly, however some of the factors presented in the other themes may affect the LfE intervention as well. All themes are described below, and a summary is provided in table 6.

Figure 16 Overview of stakeholders participating in the interviews.



CHW = Community Health Worker
IC3 = Integrated Chronic Community Care
HSA = Health Surveillance assistant
MOH = Ministry of Health
PIH = Partners in Health

5.4.2.1 Programme resources

CHWs perform many tasks: they screen households on a monthly basis, they provide education, they accompany household members to health facilities, and they regularly check up on household members who are taking medication. As the CHW programme serves the entire population of Neno District, having many CHWs on the ground is essential for the day-to-day activities as provided in the programme.

"We are covering the whole district and have a CHW in every household, so that means more numbers of Community Health Workers. And [CHWs] are covering eight health priority areas … there are so many different parts within each disease area […]. So, it's a large programme […]." – Stakeholder 2

The CHW programme covers a large geographical area as well as many health aspects. The CHWs have an important role in local health surveillance and act as the eyes and ears on the ground. They actively monitor infections and the health status of community members and inform the relevant authorities about their findings, which allows the authorities to respond timeously to issues on the ground.

"[…] if you don't liaise with the community health workers you can't go into the village and find that particular client, it's clearly impossible. […] [CHWs] are the people that are in the villages […] they're [DHO's] eyes." – Stakeholder 10, other PIH Programme

"[…] we also have a local health surveillance […] by having [CHWs] in every village. We have a team of people that are monitoring, like what are the challenges […] at community level, and [CHWs] are able to inform the relevant authorities". – Stakeholder 2, CHW Programme

Table 6 Overview of themes.

Theme	Description
Programme resources	Many CHWs are needed to perform the tasks set out in the household programme.
Workloads	CHWs are assigned many tasks, and have responsibilities at home as well as at work.
Geographical challenges	Neno is a mountainous district and villages are very spread out, making it difficult to travel around.
Incentives	There are several incentives for CHWs, including a stipend, training, and opportunity to care for community members.
Collaboration	Collaboration among various stakeholders, including the MOH and programmes delivered by PIH in other countries is important for the CHW programme.
Learning from Excellence	LfE provides an opportunity to appreciate CHWs and can act as incentive.
CHW variation in tasks performed	Individual CHWs give their own twist to their assigned tasks.

CHW = Community Health Worker
LfE = Learning from Excellence
MOH = Ministry of Health
PIH = Partners in Health

The CHW programme covers a large geographical area as well as many health aspects. The CHWs have an important role in local health surveillance and act as the eyes and ears on the ground. They actively monitor infections and the health status of community members and inform the relevant authorities about their findings, which allows the authorities to respond timeously to issues on the ground.

"[…] if you don't liaise with the community health workers you can't go into the village and find that particular client, it's clearly impossible. […] [CHWs] are the people that are in the villages […] they're [DHO's] eyes." – Stakeholder 10, other PIH Programme

"[…] we also have a local health surveillance […] by having [CHWs] in every village. We have a team of people that are monitoring, like what are the challenges […] at community level, and [CHWs] are able to inform the relevant authorities". – Stakeholder 2, CHW Programme

As most of the available budget is spent on CHW stipends, limited funds are available for training activities.

"[…] because 90% of the budget is […] the stipend of the CHWs […] that leaves […] only about 10% for the implementation of activities […] it's a hard decision to make […]" – Stakeholder 1, CHW Programme

While stakeholders agreed that procurement of smartphones for the mHealth application was expensive, some thought that this made the entire project unaffordable. However, others believed it reduced costs in the CHW programme because once the phones were procured only airtime had to be paid for.

"[…] the [mHealth] project itself is too expensive […] it requires a smartphone and for sure smartphones are very expensive." – Stakeholder 8, CHW Programme

"[…] the cost for the [mhealth] was the procurement of the phones, but once we did that, we were just looking for the credit, which is not like on the big scale." – Stakeholder 1, CHW Programme

CHWs sometimes leave to work for different organisations who are interested in the trained and experienced CHWs. Finding and training replacements is expensive from the perspective of PIH, and best avoided. However, for CHWs opportunity for better employment may be an incentive.

"[…] nowadays a lot of NGOs are implementing different programmes within the district […] whenever they are reaching the communities where [trained] CHWs are […], [CHWs] have been imparted with a lot of knowledge of which other organisations […] benefit from […]."- Stakeholder 8, CHW Programme

"[…] preparing [CHWs] for work, like trainings, it's a huge, huge budget." – Stakeholder 2, CHW Programme

Keeping up with the identification of replacements of CHWs who have left their role is difficult. CHW attrition could pose a problem for continuity of care.

"[…] it's very difficult, like keeping up and then making sure that [CHWs] that have resigned or have moved out [are replaced]. Like keeping up with training new people that have joined the programme, it's a challenge."- Stakeholder 1, CHW Programme

5.4.2.2 Workloads

CHWs have a high workload, which, according to stakeholders, is not suitable for volunteers. Depending on the number of household members, each monthly household visit takes approximately 30 minutes. In addition to the visit itself, the CHW has to walk to the house, which is not always situated near them. If any of the household members fall ill, the CHW has to check up on the patient and potentially accompany them to the health facility, which can be situated far away. If the CHWs have any Tuberculosis (TB) patients or newly identified HIV patients among their households, they have to visit them on a daily basis. Finally, when patients do not attend appointments, CHWs are asked to identify the patient and bring them back into care.

While CHWs receive a stipend, this is not considered sufficient for the tasks they perform.

"It's a lot and not suitable for a volunteer, actually it would require a full-time employee […] we're asking people to do a fulltime job on a part-time or volunteer basis." – Stakeholder 2, CHW Programme

Workloads are increased when household members are absent during an initial visit (e.g., due to them attending school, them being away from home or them attending their land). Most community members are farmers and depend on the food they grow themselves. Corn, the staple food, grows during the rainy season only, and community members are thus often absent from their homes to tend their crops. CHWs have to wait around before the community members arrive, or the household visit is cancelled, meaning the CHW has to come back another time.

"When it comes to the rainy season, […], a lot of household members are busy with their farming so there is nobody […] [CHWs] visit the household maybe for more than two times." – Stakeholder 8, CHW Programme

Furthermore, there is a lack of male involvement in the CHW programme with adult male household members often absent during CHW visits. This makes it difficult to

screen them and refer them on time. One of the CHWs I observed asked us not to attend their second home visit as they believed the male household member would be present. They had not been able to see them before and were afraid our attendance would make the household member feel uncomfortable.

For the CHWs, it can be difficult to balance being a CHW with their own farming and family responsibilities.

"So, in the course of their work they are supposed to sort of balance their lives: work for [PIH] as volunteers, and at the same time they need to take care of [CHWs'] families. So, it's not easy and sometimes […] the CHWs may be tied up with their personal activities." – Stakeholder 1, CHW Programme

To save time the CHW asks those present about the health conditions of those who are absent, but this is less reliable and may mean certain topics are not discussed if 'stand-in' household members feel uncomfortable answering screening questions on absentee's behalf, or do not know the answer to the questions. For example, in one observation, the household member who was answering questions on behalf of an absent household member mentioned they did not discuss family planning. During another observation, I heard that the CHW sometimes talks about sensitive topics with individual household members outside of the monthly household visit.

In addition, workloads of CHWs are quite high as the data they collect on paper, as is still happening in 12 of the 14 catchment areas, has to be collated during village meetings. Collated data is subsequently presented to the Site Supervisor, who has to collate data from all villages in their catchment area. It is easy to make mistakes during the various data collation processes. Due to the large amount of data that is collected, it is not considered possible to look at the individual performance data of CHWs and SCHWs, which means opportunities to learn from this data in case CHWs perform well, or to support them in case they don't perform well, is limited.

"[…] we have over a thousand community health workers who are visiting households on a daily basis, meaning from every visitation that they are making they are generating data and information which is just a nightmare on a paper-based system." – Stakeholder 2, CHW Programme

The mHealth application is expected to reduce the workload of CHWs as data is automatically collated and send to M&E, where they can investigate individual performance of CHWs and provide support where needed. As data collection is standardised and less prone to errors, the quality of the data is expected to improve. At the time of the interviews not all of this was possible as the dashboards, on which data collected with the mHealth application is presented, were not yet running as they should.

"[...] data aggregation meetings] are not happening just because once [CHWs] have entered some figures the report is directly being generated [...] so the workload has been reduced." – Stakeholder 8, CHW Programme

5.4.2.3 Geographical challenges

Due to the mountainous terrain of Neno District there are transportation difficulties at all levels: from CHW to community members, from community members to health facilities, from the health facilities to the District Hospital and DHO and from the District Hospital to the tertiary care facility in Blantyre. Houses in Neno District are sometimes *"widely distributed"* and CHWs have to walk large distances in mountainous terrain to reach their community members*: "it's tough for people to move." – Stakeholder 6, other PIH Programme.*

Neno District's roads are in bad condition. Particularly during the rainy season when roads are muddy, it is sometimes difficult to reach community members as well as health facilities. During a visit to Site G, we had to wait for approximately 1.5 hours for the road to dry and shortly after we got going, we were stopped again by an impassable truck stuck in the mud. While SCHWs are given bicycles to support them with sputum collection, the terrain is generally not suitable for bikes, as roads have many potholes, and the area is very mountainous.

5.4.2.4 Tools

CHWs use several tools to perform their assigned tasks: placards for education purposes (Figure 17), booklets for education (Figure 18), referral forms, a book for data collection in the areas without mHealth (Figure 19) and a mobile phone where there is mHealth (Figure 20). The mHealth application was described as 'not yet perfect' during the interviews in January 2020, seven months after its introduction. CHWs experienced problems as the phones were not working, due to the solar powered chargers breaking down or power outages. CHWs would sometimes submit their reports late

because they were out of mobile data (which may have been used for different purposes) or did not have reception.

"[…] we are still not yet to the point whereby we will say the system is perfect." – Stakeholder 1, CHW Programme

"[…] some of the things are not working as we designed"- Stakeholder 8

"[…] there are some challenges like wetting of the phone with the rains, stolen [..] [solar] panels and even the phone itself. – Stakeholder 4, CHW Programme

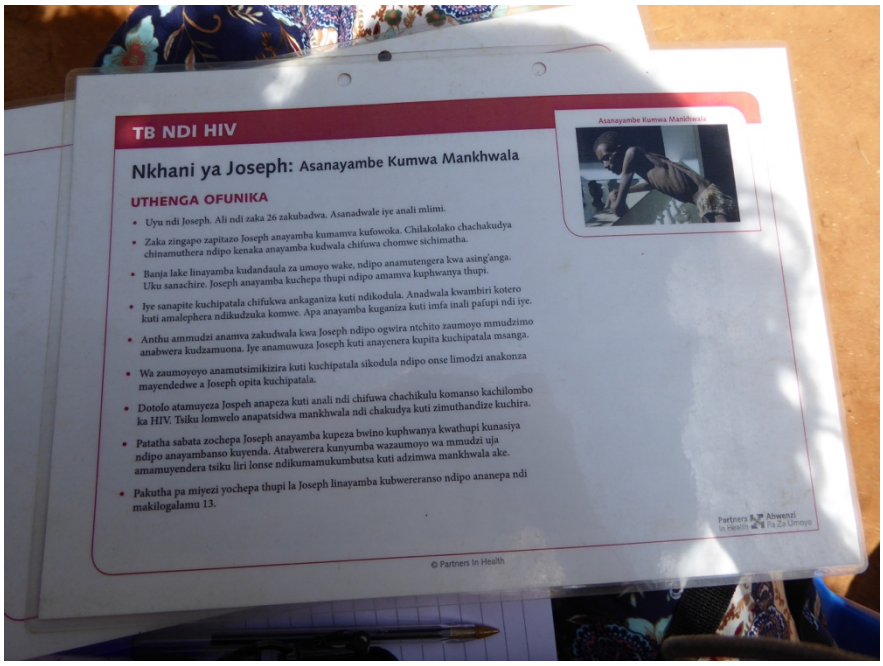
While CHWs were initially apprehensive about using the mHealth application, as they thought it would be too difficult for them, according to stakeholders most have adapted very well.

The mHealth application is a comprehensive tool that supports CHWs in screening as well as decision making practices. A stakeholder mentioned that some CHWs seemed more comfortable with the mHealth application than others. I did not investigate which CHWs were more comfortable than others with the mHealth application, and why. Knowledge of the phone as well as the questions asked during the screening seemed to improve the flow of the screening visit. Some CHWs asked the screening questions and only filled them in at the end of the visit, asking some additional questions they had missed in the first instant. Others immediately filled in the answers to the questions on the phone. We had to wait while this was happening. Furthermore, there were some instances where the application did not load or where the recorded data could not be submitted, due to a lack of airtime or lack of connection due to the remote location of the visit.

"[…] it's the first time most of [CHWs] use […] technology […] but we feel that [CHWs] have coped quite well." – Stakeholder 2, CHW Programme

Some CHWs carried rain gear, like an umbrella and most CHWs carried a small bag, see figure 21. CHWs are supposed to carry referral forms and I had seen them being used in my site orientation visit in October 2019, however while CHWs recommended clients to attend services at the health facility, like the under-five clinic, antenatal care services or an HIV test, no referral forms were used during the observations.

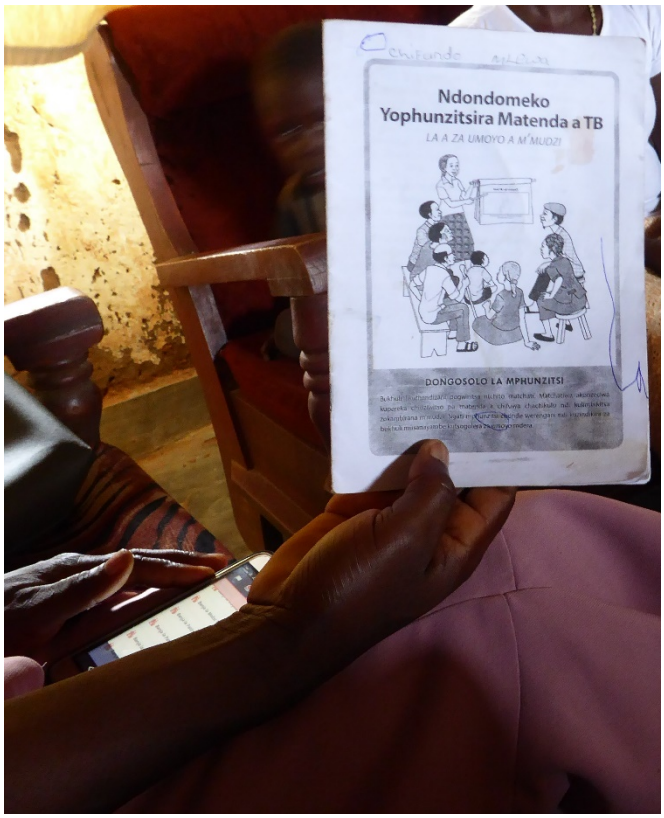
Figure 17 Placards used for education by CHWs.



Example of placard for education about TB

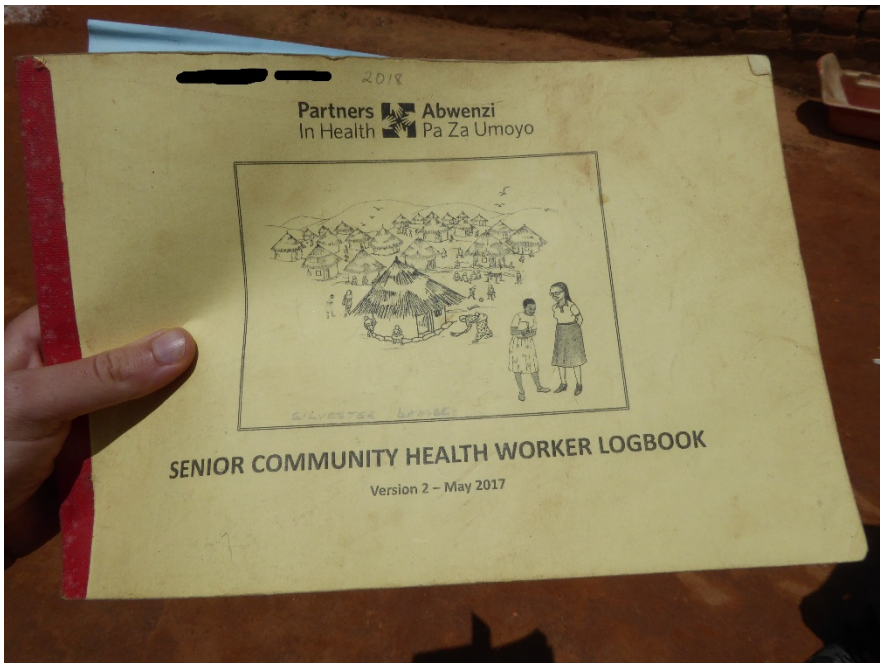
CHW shows an example of placard regarding education about nutrition. Photo taken during household screening, taking place on the front porch. Photo showing CHW, and the bag they used to carry around the placards for education.

Figure 18 Booklets used for education by CHWs.



CHW shows booklet used for TB education. On their lap the phone, used for screening household members, can be seen.

Figure 19 Logbook for data collection by CHWs, in areas without mHealth.



Logbook used by SCHWs to collect data of supervision visits.

Figure 20 Mobile phone used by CHWs in area with mHealth.

CHW shows the phone they use for monthly household screening. Photo taken during household visit, on front porch.

CHW registers information provided by household members on their mobile phone during a household screening visit.

Figure 21 Bags used by CHWs to carry materials.

CHW on their way home after a household screening visit. They are carrying an umbrella as rain was looming and a handbag containing the tools needed for the household visit.

CHW registers data into mobile phone during a household visit. They are carrying a jumper and a small bag. The car in the background is a PIH vehicle.

A close-up of a bag carried by a CHW. The bag included, amongst other things, the mid-upper arm circumference measure (MUAC), as shown in the picture.

SCHW during a supervision visit. On the ground next to the chair, behind the SCHW's legs, the SCHW's folder is shown. The folder contains the tools needed for the SCHW visit.

5.4.2.5 Incentives

In the interviews various examples of incentives for CHWs were mentioned. CHWs are given a stipend, which is a financial incentive – but *"it's not a salary, it's just a stipend." – Stakeholder 3, CHW Programme.*

CHWs are also given goats, which is an in-kind incentive. The idea is that the goats reproduce, and the offspring are given to other CHWs. The first goats can subsequently be eaten. Some stakeholders mentioned additional in-kind incentives, including teaching materials and trainings provided to build CHW capacity. However, stakeholders added that they thought these incentives were part of the role of CHWs and not an incentive per se. According to stakeholders' other in-kind incentives included smartphones in Site F and G and bicycles for SCHWs.

"[...] even though personally I do not agree that training someone to do your job is an incentive [...]." – Stakeholder 2, CHW Programme

It was suggested that further in-kind incentives could be provided to CHWs to thank them for their hard work. Examples were t-shirts, which would show they are CHWs, making it easier for community members to identify them as CHWs. A stakeholder mentioned that the t-shirt, which would set the CHW apart from other community members, would make CHWs feel proud.

"Like a T-shirt that has been written their names, their duty assigned, so they get motivated whenever they are going to their home visit [...] notify that this one is working [...] it's a CHW." – Stakeholder 4, CHW Programme

However, some stakeholders mentioned that the anonymity of CHWs has led to less stigmatisation since the introduction of the household model in 2016. Before the introduction of the household model, CHWs in Neno District would only visit TB patients and HIV patients. Community members would notice the CHWs visit certain houses on a frequent basis, and they realised there was probably a patient in those houses. Since 2016, all houses are visited on a regular basis, making it more difficult for community members to identify HIV and TB patients and stigmatise them.

Stakeholders suggested providing CHWs with rain gear, as many CHWs don't have access to umbrellas or boots. Particularly in the rainy season when roads get muddy, waterproof shoes could help CHWs get around.

"We don't have rain coats we don't have rain gumboots. As you look at those as it is raining it is difficult for me at least to move from one place to another place." – Stakeholder 4, CHW Programme

Stakeholders mentioned that community interactions are an incentive for the CHWs. Through their role as CHWs, they assist and support community members and teach them about health. As they reside in the communities in which they work, they are often able to see the results of their work, for example when ill community members recover. While there are enmities among CHWs and community members, stakeholders mentioned that household members appreciate the work CHWs do. Finally, CHWs are trusted by the trained health professionals working in Neno District.

"[…] through the general CHW programme we are able to save the lives of our colleagues within the communities […] some of these community members are our brothers, they are our fathers, they are our sisters, so we are happy to save them." – Stakeholder 8

Another potential incentive could be opportunities for promotion, however, according to stakeholders there were insufficient opportunities for growth within the CHW programme. In the past it was possible for CHWs to become SCHWs and eventually even Site Supervisors. Currently, there are many CHWs and few supervising positions and growth within the CHW programme is thus not possible anymore.

"{…] we don't have a clear definition of growth within the programme. […] you cannot have volunteers forever, some [CHWs] need to grow within the structure, but we don't have like clear, like pathways […]". – Stakeholder 1, CHW Programme

5.4.2.6 Collaboration

There was intensive collaboration with other PIH programmes (in Neno District and internationally), as well as with the MOH in Malawi.

There are clear links between the CHW programme and other programmes implemented by PIH. For example, when patients do not show up for their appointment in the IC3 programme the CHW assigned to their household is asked to check up on them.

"[…] if you don't liaise with the community health worker you can't go into the village and find that particular client. It's clearly impossible." – Stakeholder 10, other PIH Programme

The CHW programme relies on collaboration with the MOH in Neno District and Malawi in general as well as on collaboration between the different programmes and different providers of care in Neno District. There is a good connection between PIH and MOH and they exchange data, which has become easier since the introduction of the mHealth intervention.

"We are able to share the data with our counter parts from the Ministry of Health because they are also privileged to have access, they can log in and look at the data and make some decisions." – Stakeholder 1, CHW Programme

However, in the past it has sometimes been difficult to convince those not working with PIH about the strengths of the CHW programme that is in place. Furthermore, to collaborate successfully with other stakeholders in Neno District, meetings at the health facility level are organised, but these are often not attended by stakeholders.

"So basically, it is very difficult to convince some people to say that I think this model is good." – Stakeholder 1, CHW Programme

The good communication between MOH, PIH and the different healthcare programmes that is in place means that patients who have missed appointments at the health facility can be traced and encouraged to attend future appointments. Additionally, infectious diseases in the community can be identified quickly by CHWs, and reported to the appropriate health authorities, who can subsequently intervene and prevent further spread.

At the international level, there is collaboration between PIH staff members working in various countries, and there are regular visits from staff working with PIH in other countries. As they are often not able to stay for long periods of time, schedules have to be interrupted to accommodate them, making it difficult for the CHW team to perform all planned activities.

"[...] maybe you able to get a phone call [...]: "ok get prepared that this, this, and that are coming from Boston [...] they want to see a, b, c, d so you should prioritise this one". So that's a challenge to us because they interrupt our normal day to day operations." – Stakeholder 8, CHW Programme

5.4.2.7 Learning from Excellence

Stakeholders considered LfE to be an opportunity to appreciate and praise CHWs in front of their colleagues and supervisors. Appreciating CHWs is particularly important

as there were few opportunities to notice the work CHWs do and to compliment and thank them for their work.

"[…] there are some individuals are being great so I think we can use this Learning from Excellence to appraise them based on the contribution they are making to the programme."- Stakeholder 1, CHW Programme

Stakeholders considered being reported for excellence in the LfE intervention to be an incentive for CHWs, particularly in the absence of appropriate financial incentives. Furthermore, through celebrating excellent events, these can be emulated in the work of other CHWs. LfE could focus attention on strengths of the CHW programme, which was welcomed as often the focus tends to be on what is not working and how to improve this.

"We are able at least to give them the gifts saying, 'you are doing a great job." – Stakeholder 4, CHW Programme

The LfE intervention is the first initiative to look at feedback from CHWs and for the CHW programme team to work hand in hand *with* CHWs, instead of *for* them. Malawi is a hierarchical society, and one stakeholder mentioned that sometimes those lower in the hierarchy, e.g., CHWs, feel uncomfortable providing feedback to those higher in the hierarchy.

However, as the project focuses on acts of excellence, some stakeholders were afraid that overall good performers, who are expected to do well in general, but who may not perform an act of excellence, would be overlooked in the LfE intervention. This could mean that these well-performing CHWs would not be appreciated for their hard work and stakeholders were worried this could lead to demotivation.

"[…] if you award, like give them a certificate or something like that to someone who is performer but hasn't been recognized for a single act of excellence because maybe it's not a human touching act. But they are hitting their targets and stuff like that. They might feel demotivated […]" – Stakeholder 2, CHW Programme

Some stakeholders hypothesised LfE could improve attitudes to work as well as performance of the CHWs.

5.4.2.8 Variation in CHW practices

While screening processes are standardised, I observed variation in screening practices. Some CHWs asked all the screening questions, others focused on particular areas

and while all CHWs screened for TB, only one screened for mental health. Upon asking stakeholders about possible reasons for this, they mentioned that the CHWs know the household members well and know what the household members feels comfortable with and what is relevant to screen them for.

In two instances the CHW asked a question to the household member they had not asked on a previous instance: one question regarded HIV screening, the other mental health. Maybe they were primed by a recent training, or they asked the question because of my presence or the presence of the Site Supervisor or CHW Programme Officer during the observation.

The education provided by CHWs varied. Two CHWs used placards, one CHW used a booklet and one CHW did not use any educational tools. Some CHWs refreshed the household member's memory regarding the education as provided last month, while others delved straight into the new topic. One CHW taught different aspects of malnutrition during their visits to different households. One CHW went off-script and explained the importance of attending the hospital before visiting traditional healers and herbalists while teaching a household about TB.

5.4.3 Context Mechanism Outcome Configurations

I identified 17 contextual factors, 42 mechanisms and 20 outcomes (Table 7). Contextual factors were divided into factors regarding the individual, the interpersonal, the institutional and the infrastructure, as explained in Chapter 3. I developed 42 CMOCs of which six regarded LfE. There were ten negative and ten positive outcomes. All CMOCs are presented in table 7 and below I will discuss the CMOCs related to LfE, which are presented in figure 22.

5.4.3.1 LfE

I identified six CMOCs related to LfE. Two CMOCs regarded implementation and design of the intervention, while four regarded ways in which LfE can impact CHWs in Neno District. There were eight mechanisms and six outcomes, of which three were negative

Table 7 Overview of all identified context-mechanism-outcome configurations for the Community Health Worker Programme and Learning from Excellence in Neno District. Several mechanisms and outcomes are mentioned multiple times, reflected by n/n at the end of the mechanism or outcome respectively.

	Context	Mechanism	Outcome
Individual	Close communities in which CHWs work and live.	CHWs are able to identify outcomes of their work and support their community which makes them feel like they are doing a good job.	Site Supervisors/CHWs motivated to perform assigned tasks. 1/4
		Guardians may be unable to attend appointments of patient at the health facility, but CHW able to step in and take patients to the health facility and they provide support to the patient while they are at the health facility.	Improved attendance of appointments.
		CHWs know when community members have an appointment at the health facility, are able to remind them of the appointment and accompany them to the health facility.	
		Community members know the CHWs well and see them regularly, allowing them to build a trusting relationship and community members open up about their health.	Timely identification of symptoms, referral, and treatment. 1/4
		DHO team contacts CHWs if information about patients is missing or if a high viral load is identified (for example). The CHW visits the community member, checks up on them and refers them if necessary.	
	CHWs have limited education.	CHW knowledge is regularly updated, and capacity increases through training, which supports CHWs at work and at everyday life.	Site Supervisors/CHWs motivated to perform assigned tasks. 2/4
			Attrition of CHWs as other programmes, who may have to offer a better salary, are interested in employing CHWs. 1/2
		Through intensive collaboration between different programmes people are able to act on issues arising at the health facility level.	CHWs feel valued, and morale, decision making, performance and commitment to the programme will improve. 1/4
		The structured forms in the mHealth application guides CHWs during household visits and supervisions ensuring they cover all important aspects of the visits. CHWs are additionally reminded about next steps to take based on the information they provide in the application	
		Open-ended questions will encourage CHWs to fill in what they consider excellence.	New insight into what is considered excellence.

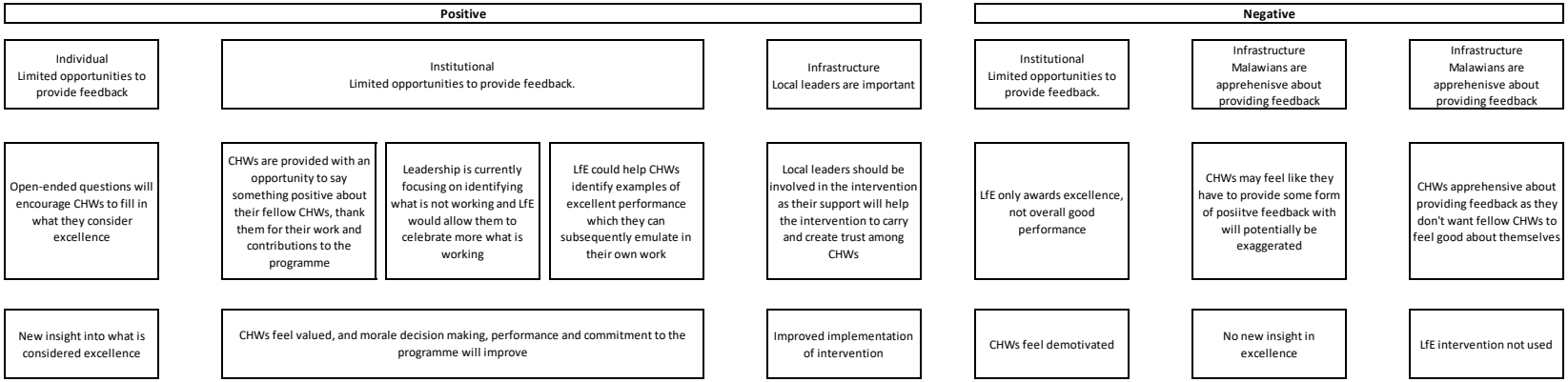
	Context	Mechanism	Outcome
	CHWs have duties at home and in the field	With the help of the mHealth programme data collected during household visits is directly uploaded and automatically collated, meaning data collation meetings will no longer be necessary and quality of data will be better as there is no aggregation process, which is prone to errors. 1/2	Reduced workloads.
	CHWs have limited experience with technology	CHWs had to start from scratch in terms of working with technology and experienced problems navigating the phones even after training had been provided.	CHWs unable to use the mHealth application correctly after initial training.
Interpersonal	SCHWs related to CHWs	SCHWs assigned to every CHW to perform regularly checks in order to assess if the CHW is doing a good job and to provide feedback.	CHWs feel valued, and morale, decision making, performance and commitment to the programme will improve. 2/4
		SCHWs feel uncomfortable reporting negative things about CHWs.	Reports cannot be fully trusted.
	Relationship between HSA and CHW	Connections between HSA and CHW improve coordination of care.	Better coordinated care.
Institutional	Various programmes delivered by PIH and MOH in Neno District.	PIH staff at different programmes knows about the work CHWs do and trust them. This makes CHWs feel good and allows them to do their work.	Site Supervisors/CHWs motivated to perform assigned tasks. 3/4
		The linkages between the different programmes make it easier to identify all sick community members, something which would be difficult to do for one programme.	Timely identification of symptoms, referral, and treatment. 2/4
		With the help of the mHealth programme data from CHWs shared with MOH, who are subsequently able to base decisions on the collected data.	Better informed decision making. 1/2
	Large CHW programme with many aspects and employees	A new layer of supervision allowed for easier supervision of CHWs as fewer people per layer had to be supervised.	Improved supervision performed. 1/2
		With the help of the mHealth programme, individual data becomes available, making it easier to identify CHWs who are struggling, so support can be provided to these CHWs.	CHWs feel valued, and morale, decision making, performance and commitment to the programme will improve. 3/4
		The mHeath intervention leads to increased capacity to collect different types of data as well as to analyse these types of data.	Better informed decision making. 2/2
		With the help of the mHealth programme data is collected during household visits is directly uploaded and automatically collated, meaning data collation meetings will no longer be necessary and quality of data will be better as there is no aggregation process, which is prone to errors. 2/2	
		SCHWs are very busy, making it difficult to perform regular supervisions	Supervision not performed. 1/2

	Context	Mechanism	Outcome
		Massive amounts of data collected on a daily basis, data has to be aggregated to keep it manageable, but this leads to reduced information about individual performance	Missing out on critical data.
	Clear role descriptions for CHWs and SCHWs	CHWs are well aware of their tasks and the tasks their supervisors have to perform	Improved supervision performed. 2/2
	Limited opportunities to provide feedback.	CHWs are provided with an opportunity to say something positive about their fellow CHWs, thank them for their work and contributions to the programme.	CHWs feel valued, and morale decision making, performance and commitment to the programme will improve. 4/4
		Leadership is currently focusing on identifying what is not working and LfE would allow them to celebrate more what is working.	
		LfE could help CHWs identify examples of excellent performance which they can subsequently emulate in their own work.	
		LfE only awards excellence, not overall good performance.	CHWs feel demotivated.
Infrastructure	CHWs have limited income	Stipend supports CHWs in doing their job	Site Supervisors/CHWs motivated to perform assigned tasks. 4/4
		In-kind incentives for CHWs make them feel valued and appreciated, as well as make them recognisable during home visits, making CHWs feel recognised when they are conducting their duties.	
	Limited resources	The work that CHWs perform is too much for mere volunteers and the lack of stipends means there is no motivation package to support CHWs with managing their workloads and responsibilities at home.	Attrition of CHWs as other programmes, who may have to offer a better salary, are interested in employing CHWs. 2/2
		Stipends are not increased with the cost of living meaning it becomes harder for CHWs to do their job.	
	Limited medically trained staff available	CHWs educate household members about certain diseases and household members are subsequently able to identify symptoms of disease early.	Timely identification of symptoms, referral, and treatment. 3/4
		People in the communities (CHWs) are given knowledge and skill to perform screening and education of community members.	
		CHWs trained to monitor health challenges and perform local health surveillance, allowing them to act early in case of (severe) illness or potential disease outbreaks.	
		Difficult to balance stipends and other activities that have to be performed in the CHW programme.	Goals not achieved
	High burden of disease	By focusing on more priority areas than just TB and HIV more patients can be referred to the health facility for support and treatment.	Timely identification of symptoms, referral, and treatment. 4/4

	Context	Mechanism	Outcome
	Mountainous district with large distances between villages and health facilities	Difficult to attend monthly household visits as well as to transport patient from the community to the health facility.	Appointments and regular check-ups missed.
		While bikes are provided to SCHWs and Site Supervisors, the terrain not suitable for bikes meaning SCHWs still cannot move around easily.	Supervision not performed. 3/3
		CHWs have no rain gear, making it difficult to move around during the rainy season as roads are very muddy and rains can be heavy.	
	Hierarchy in Malawian society	CHWs feel uncomfortable discussing potential problems with their supervisors.	Supervisor unable to act on problems experienced by CHWs.
	Apprehension about providing feedback	CHWs may feel like they have to provide some form of positive feedback with will potentially be exaggerated.	No new insight in excellence.
		CHWs apprehensive about providing feedback as they don't want fellow CHWs to feel good about themselves.	LfE intervention not used.

CHW = Community Health Worker
HIV = Human Immunodeficiency Virus
LfE = Learning from Excellence
mHealth = Mobile Health
MOH = Ministry of Health
PIH = Partners in Health
SCHW = Senior Community Health Worker
TB = Tuberculosis

Figure 22 Context-Mechanism-Outcome Configurations related to Learning from Excellence.



CHW = Community Health Worker
LfE = Learning from Excellence

As local leaders are important in the communities in which CHWs live and work (C), involving them in the design and implementation of the LfE intervention will help create trust among CHWs (M) and will support uptake (O). As there are limited options for feedback (C), open-ended questions would encourage CHWs to write down what they consider to be excellence (M) providing new insights for the CHW team (O).

The other CMOCs regarded the outcomes of LfE. In the current CHW programme there are limited opportunities for feedback (C). The introduction of LfE would provide CHWs with an opportunity to say something positive about their fellow CHWs and to thank them for their work and contributions to the CHW programme (M). The introduction of LfE could support leadership to celebrate what is working in the CHW programme (M) or help CHWs identify examples of excellent performance (M), which they can subsequently emulate in their own work (O). This is expected to lead to CHWs feeling valued and/or to improve their morale, decision making, performance and commitment to the CHW programme (O). However, in the context of limited opportunities for feedback (C), the introduction of the LfE intervention, which focuses on rewarding excellence only, could mean overall good performance would still be overlooked (M), which could lead to demotivated CHWs (O).

Another contextual factor regarded apprehension about providing feedback (C), and when LfE is introduced, the CHWs may be apprehensive about providing feedback, as they don't want their fellow CHWs to feel too good about themselves (M), which could prevent them from using the LfE intervention (O). On the other hand, the LfE intervention may make CHWs feel like they have to provide some form of positive feedback, which will potentially be exaggerated (M), preventing new insights into "true" CHW excellence (O).

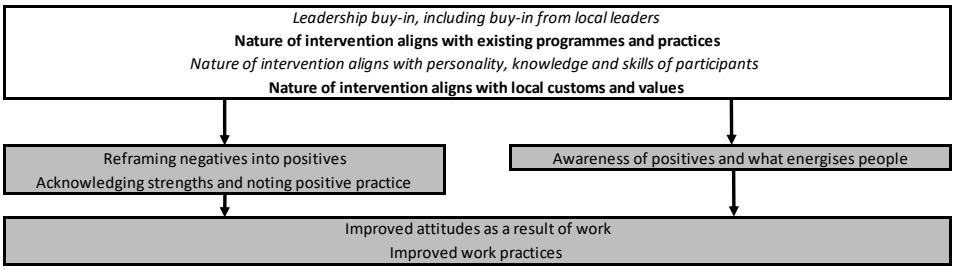
5.4.4 Logic model

The results regarding LfE specifically were compared with my findings in the systematic review, as presented in Chapter 4. Figure 23 shows the logic model factors as identified in this observational study, while figure 24 provides the full logic model, including factors that were identified in the systematic review, presented in Chapter 4.

I added two contextual factors that were identified as being important during design and implementation of LfE in Neno District. The first regarded the alignment of the

nature of the LfE intervention with existing programmes and practices. This means overall performance should possibly be considered alongside LfE as an emphasis on excellence may demotivate CHWs. The limited number of opportunities to provide feedback, either positive or negative, may impact interest in, and uptake of the LfE intervention. Furthermore, I added 'nature of intervention aligns with local customs and values' as I identified apprehension to provide feedback.

Figure 23 Logic model of factors identified in the observational study.



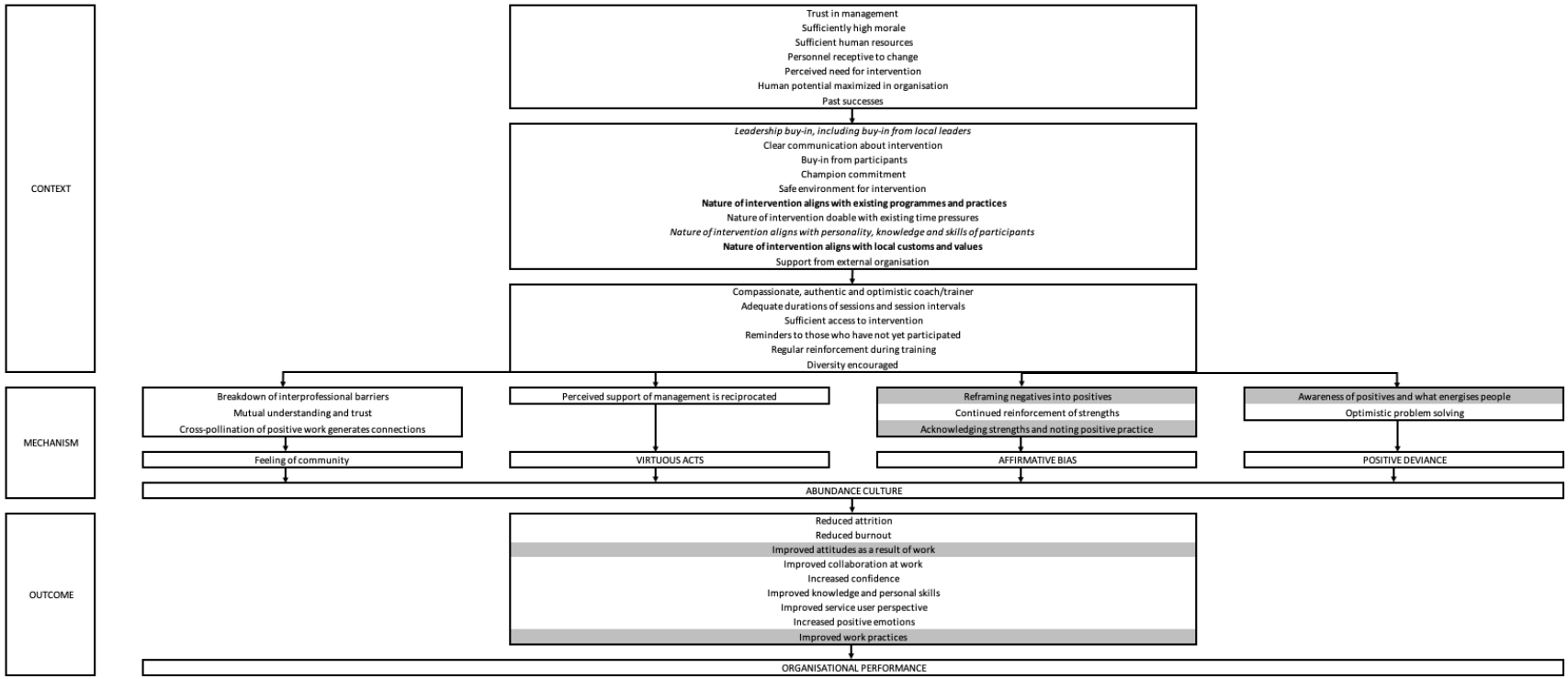
Bold	=	New components.
Grey	=	Components have been identified previously.
Italic	=	Components that have been identified previously, including new addition.

In the systematic review we identified that buy-in from leadership was a key contextual factor and, for the specific situation in Neno District, I also identified the importance of buy-in from local leaders, who have a central role in the villages. It seems important that the nature of the intervention aligns with personality of participants, but also with their knowledge and skills, particularly because CHWs have limited education and training and may be unfamiliar with providing feedback as this is not common in Malawian culture.

As in the systematic review, reframing of negatives into positives, and the focus on the positive outcomes of the CHW programmes could be an important mechanism for the LfE intervention in Neno District.

Within the CHW programme there is a focus on things that go wrong, and LfE could help CHWs, as well as their supervisors and the CHW team identify the good things that are happening on the ground, a factor that was identified in the systematic review as well. Stakeholders mentioned that awareness of positives and what is going well could energise them as well as the CHWs.

Figure 24 Full adapted logic model for LfE after observational study.



Bold	=	New components.
CAPITAL	=	Components from Lewis' theory.
Grey	=	Components have been identified previously.
Italic	=	Components that have been identified previously, including new addition.

As per the systematic review, these mechanisms are thought to help create an abundance culture in which an abundance of good is present. Through the abundance culture CHWs' attitudes to work, including morale, motivation and work commitment are expected to improve. As explained in Chapter 1, improved motivation can impact performance of CHWs, as shown in figure 24. Additionally, improved work practices are expected to lead to better patient outcomes, which is one element of CHW performance. I did not identify discordance between the intermediate outcomes identified in this observational study and outcomes identified by stakeholders.

5.5 Discussion

I identified seven themes in the interviews and synthesised the data into six CMOCs that regarded the LfE intervention itself. In Neno District CHWs play an important role in connecting the community members to the health facility, however workloads are high and there are few incentives available, leading to attrition. While LfE was expected to act as an extra incentive for the CHWs, the lack of other opportunities to provide feedback, meaning CHWs are unfamiliar with providing feedback, as well as the apprehension to provide feedback could lead to LfE not being used, leading to no new insight into excellence, or worse, demotivated CHWs. I further identified two mechanisms regarding the implementation and uptake of LfE: the involvement of local leaders, whose support carries and creates trust as well as the usage of open-ended questions on the form, which may help the team gain new insight into what excellence is.

In the systematic review we developed a logic model, explaining which contextual factors and mechanisms play a role in achieving positive outcomes of interventions like the LfE. Several of the mechanisms identified in Neno District regard virtuous acts, as through the LfE intervention an opportunity is provided to CHWs to say something positive about their fellow CHWs, albeit potentially exaggerated. However, potentially, in Neno District this mechanism will be prevented as CHWs don't want their fellow CHWs to feel too good about themselves. Additionally, I identified a mechanism regarding celebrating 'what goes well'.

As in the systematic review, I identified improved attitudes because of work as an outcome. However, I also found that in certain cases LfE could potentially decrease attitudes to work because only excellence is acknowledged, and overall good performance may be overlooked. This could be prevented by acknowledging overall good

performance alongside excellence. Other identified outcomes regarded uptake of the intervention, as well as insight into what CHWs consider excellence, or how this insight could be prevented, which was considered useful information for the CHW team.

Unlike in the systematic review I did not identify mechanisms regarding a feeling of community, nor did I identify social capital or high-quality relationships as possible outcomes. This could be due to absence of evidence, but I did identify a mechanism regarding envy of CHWs, who do not want others to feel good. This may not be specific to Neno District. In an exploratory study regarding the impact of LfE on NHS trusts in the UK it was mentioned that some health professionals did not appreciate the programme and thought it was very clique-y as the same people were reported for excellence (15).

This study had several limitations. As there was limited time to perform observations, and I had to visit Malawi during the rainy season, it was difficult to plan observations and several CHWs had to be observed on the same day. When I designed this research, I anticipated CHWs had a day full of tasks, but in reality, it turned out they perform their tasks as CHW in between their family and farming responsibilities, making it more difficult to observe the scope of CHW activities during one visit alone, leading to less information about the observations than I had initially hoped. Nonetheless, the visits that I was able to observe seemed to provide a good overview of what happens during the household visits, with few new things being identified in the later visits, indicating data saturation.

The RA's and my presence during the household visits may have affected some of the visits. We explained that we were not working for PIH as I was a visitor, and the RA was not working for PIH at the time either (they would later take up a voluntary role in August 2020, until January 2021). We encouraged the CHWs to perform their household visit as normal but appreciate that our presence may have impacted them. For example, our presence may have impacted some CHWs in their way of relating to clients and they may have stuck to the standard protocol more rigidly as they may have believed this was socially desirable (234), as explained in section 5.4.2.8. Other CHWs seemed less affected by our presence and went off-script. The presence of the Site Supervisor and CHW Programme Officer, who are directly involved in the CHW programme may have impacted visits as well. Malawi is a hierarchical society, and as the

Site Supervisor and CHW programme officer are higher in the hierarchy the CHWs may have wanted to perform well. I did notice this during two visits, where the household member commented on a screening question asked by the CHW, which had apparently not been asked before despite the CHW being assigned to their household for a long time. While our presence may have led to a better CHW performance than normally, I do not consider this an issue. The observations were aimed at giving me an idea of what is happening on the ground and to add to the interviews to get an overview of what is happening. I was however not interested in CHW performance *per se*.

A strength of this study was that we involved stakeholders not just from the CHW programme, but also from other programmes in which CHWs are involved. This provided me with a good overview of what is happening on the ground in Neno District and the tasks CHWs perform. This knowledge subsequently fed into the design and implementation of the LfE intervention.

The information gathered regarding contextual factors and mechanisms that lead to positive, as well as negative outcomes for the LfE intervention aided me in design and implementation of the intervention. For example, a few of the identified CMOCs regarding LfE showed negative outcomes. These potential negative outcomes were subsequently considered in the design and implementation in order to prevent these negative outcomes from happening. It should be noted that involving community leaders was beyond the scope of the programme, despite this being suggested by several participants. In future studies community leaders should be involved in design, implementation as well as the initial exploration stages, like this observational study.

5.6 Conclusion

In this observational study I became acquainted with the CHW programme in Neno District and the various tasks CHWs are involved in. CHWs in Neno District are involved in a wide variety of tasks, which sometimes lead to very high workloads and attrition. The CHW programme is very large, with many CHWs and it covers a large geographical area, as well as my health aspects. However, resources are limited, particularly incentives. It seems that the LfE intervention could fit in well within the wider CHW programme as it provides a potential non-financial incentive to CHWs. I identified potential contextual factors, mechanisms, and outcomes of the LfE intervention for CHWs, including the current lack of opportunities to provide feedback, but also

apprehensiveness to provide feedback, which could lead to CHWs not using the project or inflated statements about their fellow CHWs. I integrated the identified components into the logic model, which will inform the design, implementation, and evaluation of the LfE intervention.

CHAPTER 6: CO-DESIGN OF THE LEARNING FROM EXCELLENCE INTERVENTION IN NENO DISTRICT, MALAWI

6.1 Introduction

In Chapter 5, I developed a theory explaining how a Learning from Excellence (LfE) intervention could potentially impact Community Health Workers (CHWs) in Neno District. In this chapter, I will discuss how the LfE intervention for CHWs was designed, together with stakeholders in the CHW programme. The LfE intervention consists of a form that can be used to report on excellence of fellow colleagues, and feedback about who has been reported for excellence. To help align the LfE intervention with local customs and values, and implement an accessible and feasible intervention for CHWs, I chose a co-design process. In this chapter I will present some background about participatory design processes, in which co-design is rooted, before elaborating upon the co-design process in more detail. I will present some information about co-design processes in healthcare and low-resource settings. I will then describe how I co-designed the intervention together with stakeholders in the CHW programme and present the outcomes of the co-design process. I will conclude by identifying strengths and limitations of the co-design process. The co-designed LfE intervention was piloted, and eventually rolled out in Neno District, as will be described in Chapter 7.

6.2 Aim

The aim of this chapter was to co-design a Learning from Excellence intervention with stakeholders and CHWs and SCHWs in Neno District, Malawi (objective 3). Figure 25 presents how the objective fits in with the other studies performed as part of this thesis.

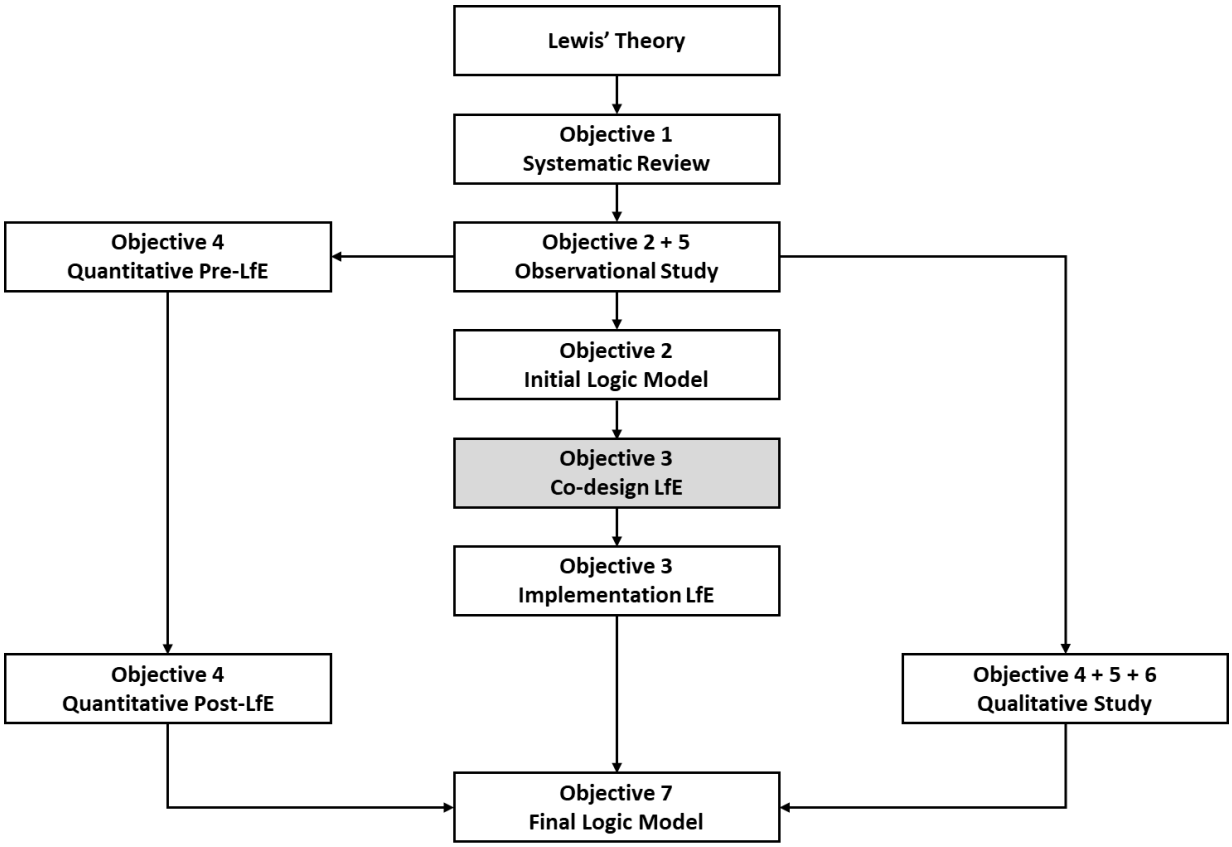
6.3 Background

6.3.1 Very short history of participatory design.

Co-design is one example of participatory design (PD). PD processes gained popularity in the 1960s and 1970s on both sides of the Atlantic. In the United States of America (USA) community consciousness led to an increased sense of social responsibility and the establishment of community design centres. These centres offered design and planning services which enabled citizens to define and implement their own planning

goals. The centres fought against urban redevelopment, advocated for the rights of poor citizens and developed methods for citizen participation (235).

Figure 25 An overview of study components with the focus of this chapter coloured in grey.



LfE = Learning from Excellence

On the Eastern side of the Atlantic, in Scandinavia, participatory design began as a reaction to the introduction of computer-based systems in the workplace and the effects this had on workers. Workers felt that when technology was introduced in the workplace they were neglected and they argued that technology was yet another tool of management to exercise control over the workforce (236). This led to a new design philosophy, called "tool perspective" by Pelle Ehn, who said that *"the new technology-based tools should be designed as an extension of traditional practical understanding of the craft of profession"* (235). The idea behind this design philosophy is that design of the technology-based tools must thus be carried out by design professionals in collaboration with experienced users, who have practical understanding but no, or limited insight in technical possibilities, while design professionals who may have limited

practical understanding, but thorough knowledge of the technical aspects of new technology. (237)

6.3.2 Participatory Design Processes

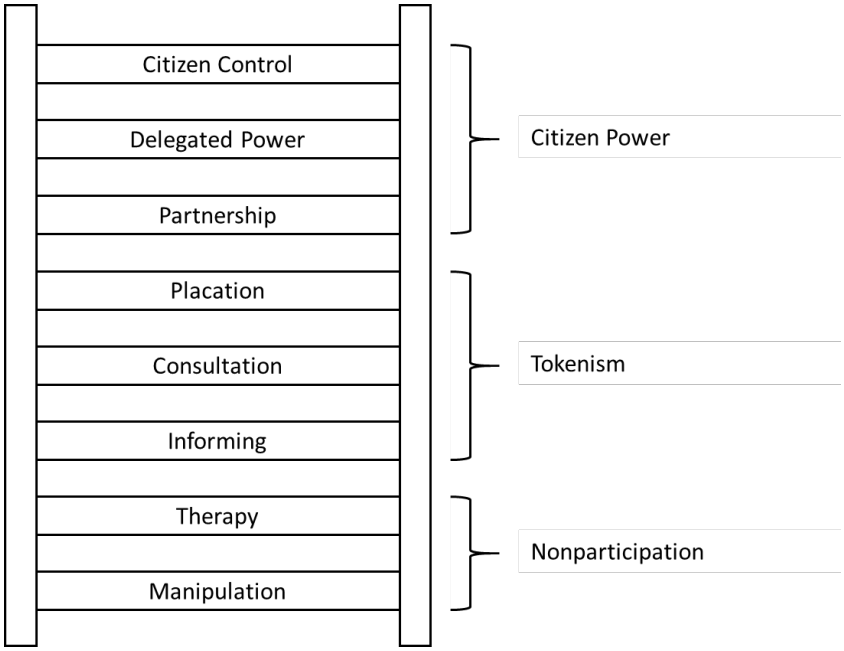
In PD processes, stakeholders, and end-users (of the to-be designed product or process), who are experts of their own lives and the context in which they lead them, are given the opportunity to provide input into the design of interventions or processes that (may) affect them. The principle underlying PD is that outcomes of PD processes, like interventions, processes or environments, work better if end-users and stakeholders are active and involved in the design of these outcomes (235). PD can cut across traditional professional and cultural boundaries and the tacit, invisible aspects of human activity, going beyond listening to what people say and observing what people do, can be examined (238). For example, the knowledge about what participants feel and what their dreams are could help reveal latent needs and desires (239, 240). Mutual learning by all participants in the PD process, including both end-users and designers and/or researchers, can lead to a better understanding of one another, and thus better communication and cooperation. By combining and integrating ideas of all participants, which are potentially more creative coming from end-users, but more feasible coming from designers (or the other way around) creativity as well as feasibility of the end-product increases (241-243).

There are various types of PD processes, including, but not limited to, experience-based co-design, community-based participatory research and technology co-design (244). All approaches share the view that end-users should be given a voice in the design of processes and interventions, and while they are all different, some more than others, in perspectives and ideology, the various PD processes share some common features. For example, in all PD processes, outcomes that cannot be fully predicted in advance are generated through interactions between participants. Furthermore, in all PD approaches the process itself is a collaborative, creative endeavour, requiring imagination, exploration, field testing and evaluation to move on from idea to prototype and eventually to final output. All processes put individual experience, of the patient, the end-user, or the community member, at the heart of their creative design effort. Finally, the process of PD is as important as the outcomes, as a well-designed and adaptive PD process is more likely to lead to acceptance of the end-product by end-

users (244, 245). Increased loyalty towards the end-product is subsequently expected to support rapid implementation and diffusion of the designed project (246).

However, not all PD processes are truly participatory. Arnstein developed a ladder of citizen participation, a specific PD process, explaining different levels of participation, as shown in figure 26 {Arnstein, 1969 #160}. This ladder of citizen participation is well-known, and thus mentioned here. The two bottom rungs of Arnstein's ladder of citizen participation include manipulation and therapy which describe levels of non-participation. The next three levels include informing, consultation, and placation, which describe varying degrees of tokenism. Whereas participants are heard during these processes, their views may not be included in the final product. The next three processes, with varying degrees of citizen power, are partnership, delegated power, and citizen control (247).

Figure 26 Arnstein's Ladder of Citizen Participation (247).

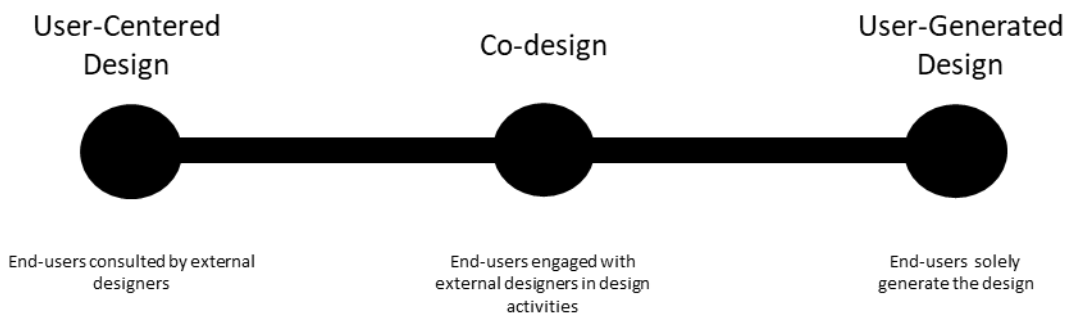


6.3.3 Co-Design

As mentioned above, there are many different terms for PD processes and broadly speaking they can be divided into three different approaches, in order of increasing end-user participation: user-centred design, co-design (delegated power) and user-generated design (citizen control), see figure 27 (240). The approaches cannot directly be linked to Arnstein's ladder, but while user-centred design entails consultation, co-design entails a partnership. User-generated design is most comparable to delegated

power and citizen control (247). In user-centred design, a term that originated in Donald Norman's research laboratory at the University of California San Diego in the 1980s, stakeholders (including end-users) are involved throughout the design process. They can provide designers with insights and are consulted throughout the design process by non-stakeholder designers and/or researchers. In their work, Norman stressed the need to fully explore needs and desires of users and the intended use of the designed product (248). In the 1990s it became apparent that PD processes could be used to design future experiences, as well as products, which led to the emergence of a co-design process. While in user-centred design end-users are asked for insights, in co-design the final product is designed together with end-users. Stakeholders thus act as design partners and active co-creators to perform generative design activities together with the designers/researchers (249). In user-generated design, the stakeholders become sole generators of the design (240). In this study I used a co-design process, allowing participants to fully take part in the design. A user-generated process was considered infeasible as the end-users had no prior experience with LfE.

Figure 27 A spectrum of participatory design (240).



Co-design is rooted in Community-Based Participatory Research (CBPR), which originated in development studies and is aimed at increasing community participation and ownership in development of processes or interventions (240); instead of designing *for* people, in CBPR design occurs *with* people (249). CBPR initiatives emphasise the equitable engagement of stakeholders throughout the research process, from problem definition, through data collection and analysis, to dissemination of findings (250).

Several key principles have been identified for co-design: 1) it is a participatory, empowering and long-term process, 2) there is cooperation between participants, 3) there

is co-learning with mutual exchange of information between participants, 4) it involves system development and 5) there is implementation of an intervention or process based on the findings (251).

In a systematic review regarding co-design of mobile health (mHealth) delivered interventions, Eyles et al. identified the following phases of the co-design process: 1) assessment of background knowledge and evidence, 2) assessment of end-user needs in order to inform the focus of the intervention, 3) assessment of end-user needs to inform type of technology used, 4) development of intervention prototype, including content, 5) pre-testing of the intervention prototype followed by changes based on feedback of end-users and 6) pilot testing of the intervention in the real world (251). End-users, relevant stakeholders and designers and/or researcher collaborate on all aspects of intervention design; from needs assessment to content-development, pilot testing and dissemination (251).

While claims are often made for better uptake of intervention due to co-design activities, as mentioned above, a recent rapid review of reviews regarding co-design processes, identified limited empirical or experimental evaluation of impact of co-design. However, a qualitative assessment of co-design of research showed that outcomes of co-design processes were considered to help tailor survey questions and design of materials, which were better suitable for participants. Additionally, benefits for participating end-users were identified, including positive emotional outcomes, increased knowledge, and increased skills. Various negative aspects were identified, including the increased time and financial resources needed for co-design processes as well as tensions between researchers and end-users (252).

6.3.4 Co-design in healthcare

My research takes place in a healthcare setting in which experience-based co-design, where patients participate in the design of their healthcare process, is one way of involving patients, the end-users, in design of healthcare services (253). Experience-based co-design often occurs in healthcare settings to ensure that health services and/or healthcare pathways are designed, and continually redesigned, around the experiences of patients and carers (253). Important in experience-based co-design is the emphasis on the experience of patients; and its aim is to design a good experience rather than an efficient process, although these are not mutually exclusive. Furthermore some co-

design processes in healthcare involve technology co-design, allowing health professionals to design and control their job resources (244).

This research takes place in a low-resource setting and below several examples of co-design in these kinds of settings are presented. For example, a co-design study regarding improved cook stoves, performed in an Indian slum, showed that the designers' technical knowledge was brought together with the slum inhabitants' experiences of cooking (254). The co-design process led to new findings that would not have emerged without otherwise. For example, the co-design process showed that participants were willing to spend more money on a cook stove that would reduce smoke-exposure, while in literature the reduction of cost is considered very important (254). Another co-design study, regarding toilet systems, was also performed in an Indian slum (255). The designers pointed out that co-design showed the invaluable expertise of end-users and led to more suitable end-product. For example, the toilet blocks designed in the process included a children's block, as many slum inhabitants are children, who often lost out to adults due to long queues (255).

In Rwanda, a PD process, including a co-design element, was held to help control malaria (256). During PD workshops community members commented on and decided on technical tools for collecting and reporting mosquito species, mosquito nuisance and confirmed malaria cases. Participants in the co-design process acquired knowledge and felt part of the design, which motivated them to contribute to the research that was conducted, as well as malaria control practices. Involving citizens led to decisions that were not foreseen by the researchers, as for example, participants suggested to use tools that worked for them, but which were initially not considered for use by the research team (256).

Finally, co-design has also been used for CHW selection processes in Kenya, Malawi, and Ghana. During a 2-day workshop, representatives of three CHW programmes were involved (178). Draft versions of a written test and interview for CHW selection were designed. Drafts were swapped between teams and feedback was provided. The collaboration helped to ensure acceptability of the CHW selection processes (178).

6.3.5 Rationale for co-design

I am not from Malawi and am unfamiliar with the context in which CHWs work and live. I chose a co-design process because, as described above, this could lead to new

insights, and the collaborative of a co-design process could help limit power differences between myself and stakeholders, as in the design process all participants would be considered equal (257). In the co-design process, potential arbitrary attribution of characteristics to a target population is discouraged. As I mentioned, in co-design processes partnerships are promoted and knowledge is shared to develop and implement solutions suitable for, and feasible in, the local context. Furthermore, with the help of a co-design process the knowledge of a researcher about a setting or environment increases, whereas knowledge of the to-be designed product increases for stakeholders and end-users. I hoped that involving stakeholders in the design of the LfE intervention would increase buy-in of stakeholders, which in turn would encourage the continuation of the intervention beyond the duration of this research, which is one of the potential advantages of co-design, as described above. Involving stakeholders could increase transparency and promote shared ownership over the activities and outcomes (258), and lead to more effective implementation and potentially better design outcomes. Finally, co-design could empower for future development activities (259). On these premises I decided to design and/or adapt the LfE intervention through a co-design process.

6.4 Methods

I followed the process as described by Eyles et al. for designing mHealth interventions as initially we aimed to integrate the LfE form into the mHealth programme as used by CHWs in two of the 14 sites in Neno District. Three phases of co-design were set out by Eyles et al., which will be described in more detail below (251):

1. Initial exploration of work.
    a. Assessment of background knowledge and evidence.
2. Discovery processes
    a. Assessment of user needs to inform focus of intervention.
    b. Assessment of user needs to inform type of technology used.
3. Prototyping
    a. Development of intervention including content and framing.
    b. Pilot testing.

6.4.1 Setting

An overview of Malawi and Neno District as well as the CHW programme and other healthcare delivery programmes in which CHWs are involved was provided in Chapter 2. Co-design activities were performed in the Partners in Health (PIH) office in Neno Town, a meeting room in the District Hospital in Neno Town and at the home of the co-initiator of the project.

6.4.2 Participants

All stakeholders in the PIH CHW programme in Neno District were invited to participate in various co-design activities. Stakeholders were selected by me, as researcher and co-initiator of the project, the Chief Medical Officer (CMO) and the Community Health Director (CHD) who have thorough knowledge of the CHW programme, CHWs' performance and CHW activities, as well as about those involved in the CHW programme and other PIH programmes. To ensure a representation of diverse views we invited those involved in the CHW programme, as well as others who had knowledge of CHWs' work, thus not limiting participation to those working in the CHW programme alone. We additionally invited stakeholders working with the Ministry of Health (MOH) in Neno District. HSAs were not involved in the co-design activities because as shown in figure 9 in Chapter 2, HSAs act at the level of the Site Supervisors and while there are communication lines between the CHW programme and the HSAs, the latter are not involved in the day-to-day activities of CHWs.

All stakeholders were based in, or visiting, Neno District during the co-design activities. An overview of the invited participants, including their roles, and if they are involved in the programme in the community or at the PIH District Health Office, as well as why they were selected and who they were selected by and the co-design activities they participated in is presented in table 8.

6.4.3 Co-Design Process

It is important to note that in the co-design process power is delegated to the participants and all decisions regarding content and implementation of the intervention are made by participants (247). As participants can only become co-designers when they are given appropriate ways of expressing themselves, extra care was taken to ensure participants felt free to express themselves (244, 249).

LfE is an intervention consisting of three aspects: a form to report excellent events, a feedback loop in which those reported for excellence, as well as potential others (i.e.,

supervisors or those reporting excellence) are informed about the excellent report, and the follow-up of some excellent reports that stand out in order to learn more from these events.

I initially planned to conduct three separate design workshops: a workshop for PIH and MOH stakeholders in the CHW programme, a workshop for senior CHWs (SCHWs) and one for CHWs. However, when I discussed the co-design process with co-initiators upon arrival in Neno District, it was decided that workshops would not be the best way to obtain feedback from SCHWs and CHWs as providing feedback is not common and there is a strong hierarchy. We believed that it was unlikely that SCHWs and CHWs, who are low in the hierarchy, would feel comfortable commenting on the intervention design. Furthermore, we were unsure if they would be able to envision the end-product in the environment of a workshop, particularly as, as identified in the observational study (Chapter 5), there are limited opportunities to provide feedback in the CHW programme.

Another reason to not hold workshops was that I travelled to Neno District in the rainy season, as due to time constraints this was the only option. During the rainy season roads were muddy and travelling became difficult. Additionally, CHWs were busy with farming activities, making it difficult to gather several CHWs together for participation in the workshops. Instead of workshops we thus decided to organise several co-design activities involving 1-3 stakeholders at one point in time and pilot the intervention to obtain CHW feedback.

An overview of the activities performed for each of these steps presented by Eyles et al (251), is presented below, except for the pilot, step 3b, which is presented in Chapter 7. I ran the pilot to allow CHWs to provide feedback. The pilot was performed in one of the 14 catchment areas in Neno District, to give CHWs and SCHWs an opportunity to experience the intervention in real-life. Feedback from CHWs and SCHWs was gathered by their Site Supervisor, during pay-day. I hoped this would encourage the CHWs and SCHWs to provide feedback as it was a less formal setting than the intended workshops.

Except for online feedback, all activities were performed face-to-face, with people within a similar level of hierarchy, and in small groups to allow everyone to provide input and to minimise power imbalances (260).

Table 8 Overview of stakeholders and co-design activities.

Stakeholder	Organisation	Role	Selected by	Co-design activity	Date
Chief Health Systems Advisor	PIH, Office	Strategic lead of mHealth initiative for CHWs in Neno District. Support evaluation of data systems with focus on CHWs. Co-initiator LfE.	MK	Informal Conversation	October 2019
Chief Medical Officer	PIH, Office	Oversees clinical and inpatient departments, primary healthcare programmes, community programmes and monitoring and evaluation department. Co-initiator LfE.	MK	Informal conversation	October 2019, January 2020
				Online feedback	November 2019, January 2020
Community Health Director	PIH, Office	Oversees three community health programmes in Neno District: CHW programme, Community Programme and POSER.	MK	Formal discussion	January 2020
				Online feedback	January 2020
Community Health Worker Programme Manager	PIH, Office	In charge of CHW programme including implementation, selection, and supervision of staff as well as verification of CHW performance.	CHD	Formal discussion	October 2019, January 2020
Community Health Worker Programme Officer	PIH, Office/Community	In charge of day-to-day tasks of the CHW programme in seven health facilities. One in upper Neno, one in lower Neno.	CHD	Formal discussion	October 2019
				Informal conversation	January 2020
Global Health Corps Fellow	PIH, Office	Provides support to different community health programmes. Involved in implementation and adaptation of mHealth application.	CHD	Formal discussion	October 2019
Primary Care Clinician Manager	PIH, Office/Community	Manages clinicians within primary care programme. Close collaboration with primary care nurse manager and Site Supervisors.	CMO	Formal discussion	October 2019
Primary Care Nurse Manager	PIH, Office/Community	Manages nurses within primary care programme in Neno District. Close collaboration with primary care clinician manager.	CMO	Formal discussion	October 2019

PIH-Employed Research Assistant	PIH, Office	In charge of evaluation of household model.	M&E coordinator*	Online feedback	January 2020
Site Supervisor	PIH, Community	Manages data aggregation and meetings at health facility levels as well as supervision of SCHWs and sputum collection.	MK		
Senior Community Health Worker	PIH, Community	Supervises CHWs in village. Assigned to households for monthly household visits. Aggregates data at village level and collects sputum.	MK	Pilot	June 2020
Community Health Worker	PIH, Community	Assigned 20-40 households. Monthly education and screening visits. Daily visits to newly identified TB and HIV patients. Refer patients.	MK	Pilot	
District Environmental Health Officer	MOH, Office		CMO	NA**	NA**
Deputy District Environmental Health Officer	MOH, Office		CMO	NA**	NA**
Community Health Programme Manager	MOH, Office/Community		CMO	NA**	NA**

*M&E coordinator was not included as stakeholder as they were unavailable for participation during MK's visit to Neno District
** Stakeholders were not available or unable to travel to Neno District

CHD = Community Health Director
CMO = Chief Medical Officer
CHW = Community Health Worker
HIV = Human Immunodeficiency Virus
MOH = Ministry of Health
NA = Not Applicable
PIH = Partners in Health
POSER = Programme on Social and Economic Rights
TB = Tuberculosis

6.4.4 Co-design activities

Due to the iterative nature of the co-design process each activity was designed according to results and ideas created in a previous activity (261). I took notes during every co-design activity that I facilitated, and online feedback was saved on the W-CHARD folder of the University of Warwick. In the co-design activities, I mainly focused on the design of the LfE form. However, the implementation of the intervention, as well as how feedback could best be provided to those reported for excellence, was also discussed. Follow-up of events was discussed when the pilot was implemented and described in Chapter 7.

The LfE form was adapted according to the outcomes of each co-design activity. To ensure correct interpretation of what was discussed the adapted form was sent, or shown, to the participants in the specific activity to check if their input had been recorded correctly. As mentioned above, an overview of the various activities that were performed, including the stakeholders that were involved in these, is presented in table 8.

Step 1 – Initial exploration of work

LfE has been running in the United Kingdom (UK) since 2014. The LfE project team in the UK decided not to provide specific guidance regarding the questions on the LfE form or the language used. This was done to allow each implementing team to adapt the form to the specifics of their own organisation. No guidance was provided regarding the specific formulation of the questions in the LfE form, and each organisation that implemented LfE thus designed their own LfE form. In the UK designers and implementers of the LfE intervention can decide which questions to ask on the LfE form and they are encouraged to use open-ended questions and to not define excellence. This allows for those filling in the form to determine what is excellent, which in turn informs implementers about perception of excellence at the workplace. Furthermore, not using definitions is expected to encourage people to participate and fill in a report.

In some organisations, LfE was implemented online, while in others a paper-based version was implemented. How feedback was provided also varied in different settings, ranging from individual feedback via email to small certificates, handed out in staff meetings (own notes).

An overview of various forms, provided by the founders of LfE, Dr. Adrian Plunkett and Dr. Emma Plunkett, was used at the start of the co-design process, to give participants an idea of what an LfE form could look like. I explained to participants that the LfE intervention in the UK is implemented on paper, as well as digitally, and that feedback can be provided every month, every quarter, or every six months, either in public or private. Organisations can choose what method of implementation or feedback works for them.

In the initial phase of co-design, I was introduced to the stakeholders in the CHW programme, the CHWs and Neno District in general. I first travelled to Malawi in October 2019 for a site orientation visit. During the visit I met the co-initiators of this project and attended a monthly Site Supervisor meeting. I shadowed a CHW during one of their household visits and attended an Integrated Chronic Community Care (IC3) clinic. These activities were aimed at familiarising me with the context of Neno District and the work of CHWs. The CHW observation performed in October 2019 was separate from the observations performed in January 2020, which were described in Chapter 5. The aim of the observation in October was to get an idea of the tasks CHWs perform during a household visit, this initial exploration helped me in the co-design activities that were performed in October 2019, before I performed the observational study. During the October observation, I, the CHW Programme Manager and a RA were present during the visit. I asked for clarifications if needed and took notes regarding the process of the household visit.

During the monthly Site Supervisor meeting, where all 14 Site Supervisors gather at the PIH offices to discuss data, as well as ongoing and new projects, I introduced LfE during a short presentation, and shared examples of the forms in the UK, as shown in Appendix 8. After the presentation there was an opportunity for the Site Supervisors to ask some questions regarding the design and implementation of LfE. I took notes during the meeting.

Step 2 – Discovery processes

As a follow-up on the initial exploration of work as performed in October 2019 I performed the observational study, as described in Chapter 5. This study informed me about how LfE could impact CHWs, including contextual factors that play a role. Additionally, I learnt about the every-day work activities CHWs perform and potential

facilitating or limiting factors for uptake of the LfE intervention, like literacy levels of CHWs or opportunities to provide feedback to CHWs reported for excellence, for example.

Step 3 – Prototyping

The first round of prototyping was held in October 2019 with an informal conversation and two formal conversations. These initial chats were exploratory and aimed at providing the stakeholders with an overview of LfE in the UK, while exploring their ideas about how the intervention would need to be adapted to suit the context of CHWs in Neno District, Malawi. The example forms with which I started off co-design activities is presented in Appendix 8.

One informal discussion was held between me, CMO and Chief Health System's Advisor (CHSA), both co-initiators of the project, at the house of CMO. I started the co-design process with them as they were a) co-initiator of the project, and b) have a thorough knowledge of the various programmes run by PIH in Neno District. They encouraged me to invite Primary Care Clinician Manager and Primary Care Nursing Manager for another co-design activity. These stakeholders both work in the Primary Care programme and regularly meet CHWs both in the health facilities, as well as in the district hospital, allowing them to identify excellent performance of CHWs at various levels of the health system. A final conversation was held with CHW Programme Officer for upper Neno, CHW Programme Manager and Global Health Corps (GHC) Fellow, who are stakeholders in the CHW programme itself, at the PIH office in Neno Town. At the start of each conversation the participants were introduced to LfE in the UK and examples of forms used in the UK were shared to prime the participants. After introducing LfE, I asked the following questions, and took notes regarding the answers provided:

- What are examples of excellence of CHWs?
- What questions would you like to see on the LfE form for CHWs?
- What would reporting of the LfE forms look like in Neno District, Malawi?
- How could the reported forms be fed back to those involved?

After the initial conversations I developed a draft LfE form, based on the input provided during these conversations and online feedback on the draft was obtained from the CMO and CHD.

In January 2020, this draft form was further developed based on one informal discussion, interviews, and a formal discussion. During the informal discussion I discussed the draft LfE form again with the CMO.

During a formal discussion with the CHD and CHW Programme Manager a final draft form was developed. At this point all stakeholders working with PIH had had a say about the LfE form. For a final check, I shared the draft form with the CMO, CHD, CHW Programme Manager, GHC Fellow, and a PIH-employed Research Assistant (PIH RA) to gather final feedback.

Apart from stakeholders, I wanted to gather input into the form from the CHWs and their direct supervisors, who would be the end-users of the form. As I mentioned before, we decided against workshops, due to language, hierarchical and logistic barriers, and realised that piloting would provide a better opportunity for CHWs to provide input. In the pilot the form was implemented and CHWs were encouraged to report on excellence of their colleagues. We chose a small catchment area with only 16 CHWs and 4 SCHWs to pilot the intervention. The CHWs and SCHWs all know each other well, which we hoped would encourage CHWs, who may not be used to providing feedback, either positive or negative, to participate in the intervention. Information about the pilot and the pilot's outcomes is provided in Chapter 7.

6.4.5 Facilitator

The role of the facilitator is important in the different stages of the co-design process: performing co-design activities, adapting the co-designed product and in making the end-product. Throughout the process the role of the facilitator changes: during the co-design activities, otherwise called the 'doing level', the facilitator leads the participants in the co-design process. As the co-design product is fine-tuned and adapted, the facilitator takes up a guiding role, while a supporting role is taken up during the making of the end-product (249).

Steps 1, 2 and 3a of the co-design process, as outlined above, were all facilitated by me as all stakeholders involved in these steps knew English. It was initially planned that I would also facilitate step 3b and 3c, with the help of the team on the ground. Unfortunately, due to the COVID-19 pandemic in 2020 and 2021, I was unable to travel to Malawi to support the implementation of the pilot. The implementation was thus facilitated with the help of the research assistant (RA) who was also involved in

the observational study, and the CHW Programme Officer for upper Neno, who were both briefed by me.

6.5 Results

The results are presented per round of activities. An overview of the outcomes of the different co-design activities is provided in table 9.

6.5.1 October 2019

6.5.1.1 Initial informal discussion with CHSA and CMO

With the help of the LfE examples from the UK an initial draft of the LfE form for Neno District was designed. To allow CHWs and SCHWs, who have had little education and whose literacy levels are sometimes low, as identified during the observational study in Chapter 5, to use the LfE form easily, stakeholders in the co-design activities thought it would be good to design a form with multiple choice answer options, as opposed to the open-ended questions present on the UK LfE form.

Once this decision was made, co-design activities focused on the possible excellent events that could be performed by CHWs in Neno District, and we discussed potential outcomes of LfE in Neno District, including the potential of LfE to improve supportive mentoring and creative thinking. We discussed which other stakeholders, including those based at the district hospital, might participate in co-design activities.

6.5.1.2 Informal discussion Primary Care Clinician Manager and Primary Care Nurse Manager

During the discussion the LfE intervention was introduced and the outcomes of the first co-design activity were shared. We discussed which multiple choice answer options could represent CHW excellence. Participants mentioned the following:

- CHWs help in the identification of potential patients.
- CHWs are doing a good job in screening household members.
- CHWs accompany patients to the health facility.
- CHWs provide good follow up to patients after discharge, in particular regarding medication counselling.
- CHWs advocate on patients' behalf and explain clients' issues to clinicians.

The multiple-choice options were added to the draft form, presented in Appendix 9, which provides an overview of the adaptations to the LfE form at each stage of the co-design process.

Participants in the co-design activity mentioned they could learn the following from LfE:

- How to improve the health service.
- How to reduce patients' fear by improving patient reception. For example, sometimes a CHW brings in a client who subsequently isn't seen as the clinician is too busy. The client may not come back in the future to get symptoms checked out.
- CHWs can learn from clinicians, and the other way around.
- How the links between the households and the health facilities can be improved upon.
- How feedback can be provided on a regular basis and in what way this feedback could be provided.
- What challenges the CHWs are facing.

6.5.1.3 Formal discussion CHW Programme Officer for upper Neno, CHW Programme Manager and GHC fellow

LfE was once again introduced and examples of forms in the UK were provided. As no new information came out of this discussion, as shown in table 9, outcomes of this formal discussion were integrated with the outcomes of informal discussions described above. The formal discussion started with a chat about potential outcomes of the LfE intervention, which could be measured to identify potential impact. The following outcomes were mentioned:

- Praise provided to CHWs for doing a good job.
- Improved CHW motivation and morale.
- Improved sense of community among CHWs.
- Improved CHW retention.
- Increased CHW capacity as LfE acts through mentorship.

Participants mentioned that CHWs often hide their emotions and that the LfE intervention could allow them to be open about what they think. Furthermore, most feedback, if provided at all, in the CHW programme was negative, so stakeholders believed CHWs should be guided into providing positive feedback, which is not common in Malawi, as described in Chapter 5.

Table 9 Overview of outcomes regarding LfE form.

Co-design activity	Original Form	Rationale for Modification	Revised Form
In (formal) discussions Oct 2019	Open-ended questions.	Literacy levels of CHWs, the end-users, are limited. Few CHWs are comfortable typing a lot of text on mobile phones as they are still getting used to them.	Question 3 was changed from an open-ended question to a multiple-choice question. Possible answer options were discussed and added to the draft form.
Email feedback Jan 2020	Multiple-choice options described minimum job requirements rather than excellence.	Job requirements are fulfilled by everyone, while LfE aims to identify what going the extra mile entails.	This feedback was discussed in the formal discussion with the CHW Programme Manager and CHD. Form not changed at this point in time.
Email feedback Jan 2020	Only CHW, SCHW and Site Supervisor were listed on form.	The health facility staff, clinical staff and other members of the leadership team may also notice excellence of CHWs.	Health facility staff, clinical staff and leadership were added.
Email feedback Jan 2020	Site F and Site G were the only catchment areas listed.	Stakeholders believed that Site F and Site G should not be singled out, and CHWs in other catchment areas should be able to report on excellence as well/be reported for excellence.	Other catchment areas were added to the form.
Email feedback Jan 2020	Psychosocial support and was not part of the multiple-choice options.	CHWs often provide important psychosocial support to their clients during hospital visit and after discharge.	Psychosocial support during hospital visits and after discharge was added.
Facilitated discussion Jan 2020	Multiple-choice options described minimum job requirements rather than excellence.	The excellent events only show minimum job performance. LfE aims to identify what going the extra mile entails.	Excellent work of CHWs was discussed and the multiple-choice options were changed accordingly.

CHW = Community Health Worker
mHealth = Mobile Health
SCHW = Senior Community Health Worker

One of the participants mentioned that it would be good if households report on CHW excellence as they see the CHWs most often. Participants also mentioned that it would be important to have a feedback loop built into the mHealth application to ensure that those who were reported for excellence know about this. What this feedback loop could look like was, as of yet, unclear to the participants.

Participants supported the idea of multiple-choice options instead of an open-ended question. They considered the options as developed in the informal discussion, described above, to cover all aspects of work done by CHWs. Finally, we briefly discussed implementation of LfE, and participants mentioned that the pay-day, when all CHWs and SCHWs of the catchment area gather, would be a good moment.

Based on this activity no changes were made to the LfE form, but the outcomes of the discussion fed into implementation (guiding CHWs to provide positive feedback) and evaluation activities (outcome measures for the mixed method evaluation).

6.5.2 January 2020

6.5.2.1 Individual meeting CMO.

During the individual meeting we discussed which stakeholders should be involved in the next co-design activities. To allow as many people as possible to provide their feedback we decided to ask participants of the semi-structured interviews, performed for the observational study, what they considered excellent performance. I took notes of the provided answers and presented and discussed these examples of excellent performance during the co-design activities to determine if they should be included in the LfE form or not.

6.5.2.2 Email feedback

With the help of the replies during the interviews, performed as part of the observational study (Chapter 5) the draft LfE form was adapted. During this round of co-design activities, some participants in the interviews mentioned that they would prefer open-ended questions over multiple choice options. As so far, the majority of participants in the co-design process preferred multiple-choice options, these were added to the draft LfE form and participants in the email feedback activities were asked to reflect upon the multiple-choice options.

The drafts were sent to the CMO, CHD and the RA and they provided comments on the form. Table 9 provides an overview of the outcomes of the email feedback activities. Most comments regarded an extension of the form to allow for participants other than CHW and SCHWs to participate as well as for participants working in a different site from Site F or Site G. This deviated from the initial plan, where LfE would only be implemented in Site F or Site G as part of the mHealth application. However, participants thought providing paper forms to CHWs and/or those working in the district hospital would allow others to participate as well if they wanted to do so. One participant mentioned that the multiple-choice options did not reflect excellence but standard CHW tasks. This comment was discussed during the facilitated discussion with the CHW Programme Manager and CHD, as described below. Finally, a comment was made regarding the psychosocial support provided during hospital stay as one of the participants mentioned that psychosocial support is often provided after discharge as well, and the multipole choice option was adapted, allowing people to report on CHWs providing psychological support to their clients

A new draft was made (Appendix 9), and this draft was used for the facilitated discussion, as described below.

6.5.2.3 Facilitated discussion

A facilitated discussion was held with the CHD and CHW Programme Manager. During this discussion the choice was made to use multiple choice options, and to include one open question, asking CHWs to provide further detail about why they believed the reported event was excellent.

All the questions and multiple-choice answer options of the draft LfE form were evaluated as I asked participants to comment on the draft forms, question per question. I asked what they thought of the question, the answer options, and the amount of space there was for CHWs to write their answers. Additionally, I asked the participants to reflect on the feasibility of the form and if they thought that CHWs would understand the form. Unlike the other co-design activities, this was more structured, with standardised questions as this was the last opportunity to discuss the design of the LfE form face-to-face.

Based on the discussion, the multiple-choice answer options were refined to reflect excellence better, as opposed to standard job requirements of CHWs and SCHWs.

With the help of the facilitated discussion, we came up with the following multiple choice answer options:

The excelling CHW:

- Convinced someone (a defaulting patient) to return to care.
- Provided three postnatal care visits (although difficult to find information about this).
- Timely referred clients to the health facility.
- Regularly submits sputum for TB testing.
- Meets the TB sputum submission target.
- Regularly refers children suspected of malnutrition.
- Convinced reluctant clients to attend family planning services.
- Convinced a pregnant woman to attend ANC during their first trimester.
- Accompanied a patient to the clinic (although many patients go on their own which is also a great achievement).
- Advocated on behalf of the client.
- Provided psychosocial support while patient is admitted/during hospital stay.
- Referred a vulnerable household to Programme on Social and Economic Rights (POSER) and/or other relevant services.
- Counselled on treatment adherence

We also discussed some open-ended questions. As typing is difficult for many of the CHWs, due to low literacy levels, and little experience with mobile technology, we decided to only ask one open-ended question on the LfE form:

- Why was this event excellent?

Participants in the facilitated discussion were interested in the answers to this question as it allowed them to learn more about what the reporters consider excellence and what happened when the event took place.

Finally, we discussed implementation and decided to implement the LfE intervention during pay-day. The LfE form would be read out to CHWs, and they would be able to

ask some questions regarding the intervention. The feedback loop was considered important, and participants suggested that this could take place during quarterly trainings, where CHWs who were reported for excellence could be given a small gift. Details would be worked out later. To learn from the excellent events a short follow-up inquiry, based on appreciative inquiry, as is introduced in the UK, was suggested by me. The participants asked me to work out questions for the follow-up and share these with them.

6.6 Discussion

Through iterative co-design activities the LfE intervention, and the LfE form in particular, was designed for CHWs and SCHWs in Neno District. Implementation was discussed, but most stakeholders agreed about the best time and place, and that the form should be read out to CHWs. The feedback loop of the LfE intervention was considered an important aspect of the intervention, but the stakeholders were as of yet unsure what this would look like and decided to first see how the roll-out of LfE would go before deciding on the best strategy for feedback to those who have been reported for excellence. Finally, follow-up of certain forms was discussed, and stakeholders asked me to draft a form with follow-up questions.

While the co-designed form is similar to the forms used in the UK, a few changes were made to make the form more suitable for CHWs in Neno District. First, we chose to use multiple choice options for excellence to make it easier for CHWs, who often have limited education, to understand and fill in the forms. An option to report a different type of excellence was added in case CHWs wanted to report something that was not present in the list of options. We decided to keep the question about why CHWs think the reported event was excellent, in order to learn more about their ideas of excellence. None of the questions on the form would be mandatory.

Multiple choice options were added regarding the job role of the reporter and the site where the reporter was working from. This again was done to minimise writing or typing for the CHWs, making it easier for them to use the form.

Participation in the various design activities was good, and all participants commented on the LfE form as designed in the previous activity and provided input into how this form could be adapted. The two biggest changes throughout the co-design process regarded the use of multiple-choice options and the adapting of the multiple choice

options as designed in October 2019 to options that, according to the co-design activity participants, truly reflected CHW excellence. Several participants were able to participate in multiple activities. While in some situations they merely agreed with what was designed in their previous activity, in one situation the participant changed their opinion on the form that was designed in another activity in which they participated in and came up with ideas for change. Unfortunately, due to the rainy season and bad road conditions potential participants from the MOH were unable to travel to Neno District and we were thus not able to include them in the co-design activities.

Various potential outcomes of the LfE intervention were mentioned, including supportive mentorship, increased CHW retention, improved sense of community among CHWs, and improved motivation and/or morale. These outcomes were used to design the quantitative aspect of the mixed method evaluation (Chapter 9).

Three aspects are considered important for effective co-design: 1) a systems perspective, 2) the framing of research as a creative enterprise oriented to design with human experience at its core, and 3) an emphasis on process (244). The systems perspective was considered by including stakeholders from all levels of hierarchy in the CHW programme, as well as stakeholders in different PIH programmes, including the Primary Care programme as well as the Monitoring and Evaluation team. As CHWs are involved in many of the PIH activities, including the various stakeholders allowed us to view various perspectives on CHW performance, which helped us develop the form, mainly the type of excellent events listed as multiple-choice options. Including a variety of stakeholders led to emerging information about the CHW programme. This information may not have emerged had only some of the stakeholders be included. For example: those not based at the hospital (e.g., CHW Programme Officer) may not be aware of CHWs advocating on behalf of patients. In this stage of the process CHWs and SCHWs had not yet been involved, but we aimed to include them during the pilot of the LfE intervention.

Furthermore, the systems perspective allowed us to go back and forth between various stakeholders through various iterations, which encouraged local adaptation of the LfE forms. The research was intended to be a creative enterprise with human experience at its core, which we tried to achieve by including various stakeholders who know the CHWs and the CHW programme well. I continuously emphasised there was no right

or wrong approach to the LfE form and the creative process allowed me to get to know the CHW programme, its various stakeholders, and the setting. Through the co-design activities the stakeholders became more familiar with the LfE intervention and relationships were built between me and the various participants. It seemed that through the co-design activities understanding of the LfE intervention and its aims grew, as did support for it. Regarding the emphasis on process, as mentioned before, through the various co-design activities I got to know the stakeholders and they got to know me. The process of the activities allowed all stakeholders to provide input in the final product. Through the process they became familiar with the end-product and the intervention, which helped with the implementation process. This turned out to be particularly important when the COVID-19 pandemic hit, and I was unable to travel to Malawi for the implementation. To implement the intervention, buy-in from stakeholders and a sufficient understanding of the intervention by stakeholders was crucial and I believe that the co-design process helped to achieve this.

One of the downsides of a co-design process is that it has been criticised for being more rhetoric than substance and for being subjective to manipulation by external bodies pursuing their own agendas (240). I have tried to avoid this by going into the co-design activities with an open mind and by genuinely wanting to learn from local experience, something that I knew, and still know, little about. While I was heavily invested into the project, as initiator of the intervention, I tried to learn from the various stakeholders and to support them in building on each other's expertise. However, I am uncertain if I fully avoided manipulation of participants, particularly as I had an agenda (I wanted to implement and evaluate an LfE intervention), and this could have impacted the design of the LfE intervention. In future it would be good to allow an external person to facilitate the co-design activities, if possible. Another limitation was that the feedback loop was not yet designed in the co-design activities as per participant request.

In the next chapter I will discuss the implementation of the pilot, as well as roll-out of the intervention. In Chapter 8 and 9 I will provide detail on the outcomes of the LfE intervention and provide recommendation on how the intervention could be improved upon.

6.7 Conclusion

Through several co-design activities, including various stakeholders in the CHW programme in Neno District, Malawi the LfE intervention was designed. The co-designed forms included similar questions to the forms used in the UK, but instead of open-ended questions, multiple-choice answer options were provided. It was hoped this would make it easier to for CHWs to fill in LfE forms as this requires less typing or writing. With the help of the co-design activities, I aimed to ensure a good fit between the local context and the LfE intervention.

CHAPTER 7: IMPLEMENTATION

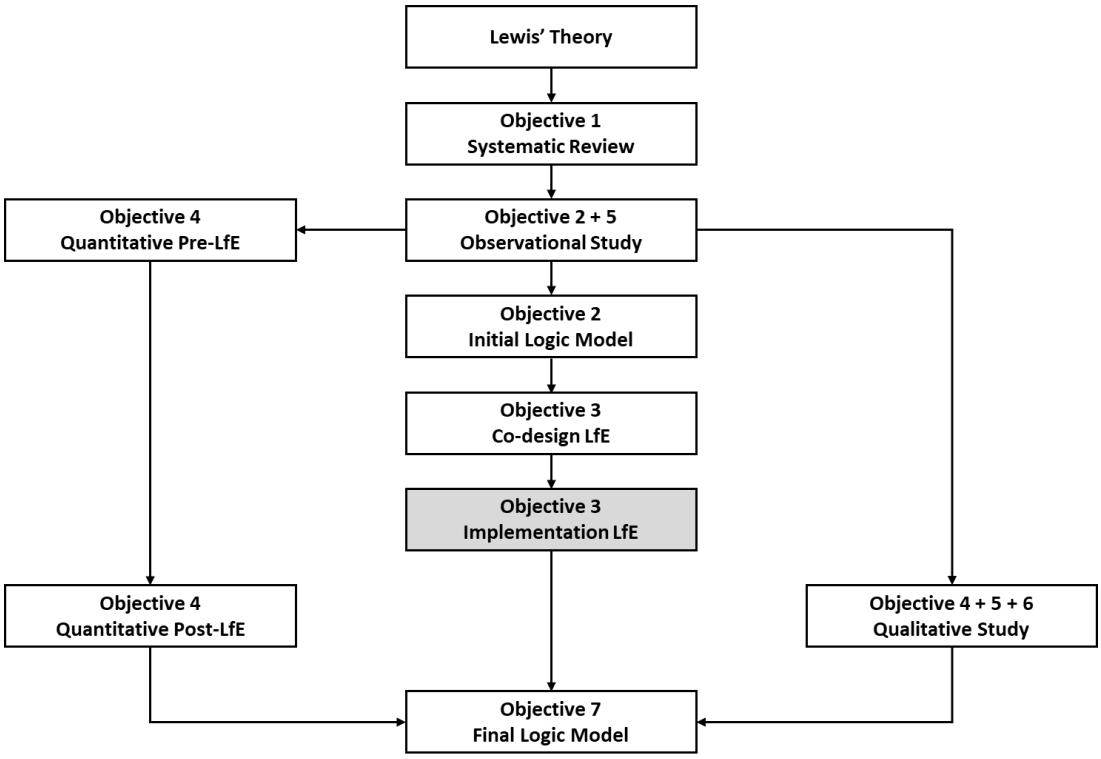
7.1 Introduction

In Chapter 6, I explained the co-design activities as performed with stakeholders. In this Chapter I will discuss the pilot study, which was performed in July and August 2020, as well as the roll-out of the co-designed Learning from Excellence (LfE) intervention in Neno District. The implementation process was affected by the COVID-19 pandemic and diverted from the initial proposal in various ways, which will be discussed here as well.

7.2 Aim

The aim of this aspect of the study was to pilot and implement the co-designed LfE intervention in Neno District as per objective 3, shown in figure 28.

Figure 28 Overview of study objectives with the focus of this chapter coloured in grey.



LfE = Learning from Excellence

7.3 Methods

This study consisted of a pilot, conducted in one of the 14 catchment areas in Neno District, as well as the roll-out of the intervention. Before describing these, I will explain how the COVID-19 pandemic impacted the pilot and implementation of the LfE intervention

7.3.1 Covid-19 impact

In January 2020, during my visit to Neno District, we decided to start the pilot during pay-day in April 2020. I would travel to Neno District and coordinate implementation with the Community Health Worker (CHW) Programme Manager and the Site Supervisor involved. Additionally, during this trip to Neno District we would be able to discuss the feedback loop. However, at the end of March 2020 it became clear that I would not be able to travel to Malawi due to the COVID-19 pandemic. We initially still aimed to introduce the LfE intervention during pay-day in April, as I would coordinate it from the United Kingdom (UK). However, the first COVID-19 cases were discovered in Malawi in early April 2020, which led to travel restrictions within the country, as well as changes in workflows for CHWs. For example, they would no longer collect sputum for tuberculosis (TB) testing, and they would avoid close contact with community members.

The co-initiator of the LfE intervention had to go back to the United States of America (USA), and the Community Health Director (CHD) was no longer able to travel to Neno District, as per national travel restrictions. As these were my main lines of communication, it became hard to get to know what was happening on the ground. In May 2020, we decided not to implement the LfE intervention via the mobile health (mHealth) application, as used in Site F and Site G. One of the reasons was that we had a lack of eyes on the ground, another reason was that the mHealth application was run from Kenya, and we thought that coordinating the design of the application from four different countries, on three different continents, would be too much, with everything else that was going on at the time. We thus decided to roll-out the intervention in a paper-based format, which provided an opportunity to roll out the LfE intervention in all 14 catchment areas. This would however mean extra work and we thus employed a Research Assistant (RA) to support us in implementation of the intervention, follow-up of forms reported in the pilot site and data collection during the first three months of the LfE intervention. The RA was previously involved in the observational study, as described in Chapter 5, and knew about the LfE programme.

7.3.2 Implementation

Meyers et al. (262) developed a quality implementation framework consisting of four phases, including 14 steps. While I did not fully adhere to the framework, as presented in table 10, the framework allowed me to structure the implementation activities that

I conducted. This framework has been shown to contribute to implementation by identifying practical steps and process challenges towards improving implementation quality (263).

Table 10 Overview of quality implementation steps conducted in this study, as per Meyers et al (263).

Phase	Step	Activity
Phase 1	Conducting needs and resource assessment	I performed the observations to identify resources, as well as in-depth stakeholder interviews to identify needs. Data is presented in Chapter 5.
	Conducting a fit assessment	With the help of co-design activities, the fit of the LfE intervention with CHWs was discussed. With the help of the pilot study, described below, the fit of LfE with CHWs was assessed.
	Capacity/Readiness Assessment	This was assessed with the help of the pilot study, as described below.
	Possibility for adaptation	After the pilot study the LfE intervention could be adapted if needed.
	Stakeholder buy-in	Through participation in in-depth interviews and co-design activities, as described in Chapter 5 and Chapter 6, stakeholder buy-in was generated.
	Building general/organisational capacity	No specific activities were conducted, but with the help of interviews and co-design activities, capacity was created.
	Staff recruitment/maintenance	During the initial months of implementation, a research assistant was recruited to assist with implementation and data collection and to encourage Site Supervisors to participate in the intervention.
	Pre-innovation staff training	CHWs were introduced to LfE during the monthly pay-day. Excellence scenarios were presented, the forms were read out to CHWs and there was an opportunity to ask questions.
Phase 2	Creating implementation teams	The research assistant, together with the CHW Programme Officers were responsible for implementation, they were briefed by me.
	Developing an implementation plan	An implementation plan was developed with the help of co-design activities, the pilot outcome. Stakeholders involved included the community health director, the CHW Programme Manager and the CHW Programme Officers.
Phase 3	Technical assistance/Coaching/Supervision	The research assistant provided technical assistance as well as coaching on the ground, together with the CHW Programme Officers and some Site Supervisors. I briefed the research assistant.
	Process evaluation	The implementation process was evaluated in the mixed method study, as presented in Chapter 9.
	Supportive feedback mechanism	No feedback mechanism was in place.
Phase 4	Learning from Experience	Recommendations were made based on the mixed method evaluation, as presented in Chapter 9.

CHW = Community Health Worker
LfE = Learning from Excellence

7.3.3 Pilot study

To collect CHWs' input about the LfE form as well as to identify if the CHWs and their direct supervisors sufficiently understood the LfE form I conducted a pilot study

in one of the 14 catchment areas in Neno District. This catchment area was chosen as it is a small area where the CHWs know each other very well, which was believed to encourage them to participate in and provide feedback on the LfE intervention.

The project was implemented in Site A during pay-day in June 2020. During pay-day, which is the last Tuesday or Wednesday of the month, all CHWs gather at a specific place to receive their monthly stipend. Apart from payment, the gathering of CHWs in one place is also used as a teaching or training opportunity. We chose to implement the LfE intervention during pay-day as this is one of the few occasions when all CHWs gather.

The CHW Programme Officer first contacted the Site Supervisor for the catchment area and described the LfE intervention to them before arrival on the site. Upon arrival, the CHW Programme Officer introduced the LfE form, the form was handed out, and the CHW Programme Officer read the form to everyone after which there was an opportunity to ask questions. They subsequently encouraged the CHWs to report excellence.

The CHWs could submit their forms in the specific submission box, which could only be opened by the Site Supervisor and the CHW Programme Officer, and which was placed in the health facility at Site A.

After two months the forms were collected from the box and submitted to the CHW Programme Manager. The CHW Programme Manager studied the forms: they identified the number of forms, who was reported and who they were reported by, as well as the type of excellent events that were reported.

The CHW Programme Manager additionally identified any peculiarities, which were outlined in a short presentation to me and the CHD. The presentation also included feedback, as obtained by the Site Supervisor of Site A, who asked the CHWs what they thought of the LfE intervention. The three of us subsequently discussed the outcomes of the pilot study, including what we think went well and what could be improved upon, including changes to the LfE form if we deemed them necessary. We then developed a plan for the roll-out in the entire district.

One aspect of the LfE intervention is the follow-up of certain reported excellent events that really stand out, or are of particular interest, to learn from these events. I developed questions to be used for follow-up, as discussed in the co-design activities in Chapter 6. The follow-up questions were based on questions used in the UK, which are rooted in appreciative inquiry (264). The questions were discussed with the CHW Programme Manager and CHD, and we agreed on the following:

1. Can you describe the excellence event that was reported?
2. How did the event affect the client/patient?
3. What did you think was excellent about the reported event?
4. Why did you decide to report this excellence event?
5. What did you learn from the event?
6. What will you do differently as a result of the excellence event?
7. How could this excellence event occur more often/be re-created?
8. What challenges might be encountered in re-creating this event?

During the meeting the feedback loop was discussed. We discussed when feedback could best be provided, how and how CHWs could be thanked for performing an act of excellence.

7.3.4 Implementation

During pay-day, on August 26th, 2020, which was identified by stakeholders in the CHW programme as a good moment to introduce the LfE intervention, LfE was introduced to CHWs in all catchment areas in Neno District. The RA introduced the LfE intervention in catchment areas in upper Neno, including Site B, Site F, Site G, Site H, Site K, Site J, and Site N. The CHW Programme Officer for upper Neno introduced the LfE intervention in Site A, Site C, Site D, Site E, Site I, Site L and Site M. On the same day, the LfE boxes, where LfE forms can be submitted, were distributed to all catchment areas. The boxes were present in all health facilities, which allowed CHWs to submit forms whenever they accompany a client to the facility. Due to large distances between villages and the health facility in two catchment areas, in each of these an extra box was placed at a health post, making it easier for CHWs to submit a form. The boxes were placed near suggestion boxes, where CHWs can submit suggestions for change or improvement, which were already present.

Upon arrival at the catchment areas the RA and CHW Programme Officer introduced the LfE intervention to Site Supervisors. They explained what LfE entails, why it was being implemented and what this would mean for the CHWs. Afterwards an LfE form was given to all CHWs who were present. The RA or CHW Programme Officer subsequently read the form to CHWs and asked if they had any questions. During implementation, two scenarios were presented to the CHWs, as shown in box 1. The scenarios were introduced after the pilot exercise as we were uncertain if CHWs understood what entailed an excellent event, and we thought it would be a good idea to prime CHWs.

BOX 1 Excellence Scenarios.

Scenario 1 Everyday performance

A patient has an appointment at the IC3 clinic and the CHW reminded the patient about the appointment and accompanies the patient to the clinic.

OR

A CHW screens a household member for TB and as they are showing symptoms, they ensure that sputum is collected, which leads to a timely TB diagnosis.

Scenario 2 Excellence

A patient was violent and distressed and there was no guardian to take care of them. In the absence of a guardian the Community Health Worker accompanied the patient to the health facility where the patient was admitted. During the stay in the health facility the CHW was acting as the client's guardian. They were looking after the client and advocated on behalf of the client.

OR

A patient is referred to the hospital and they were given some medication to take at home when they were discharged. When the patient attended the IC3 clinic the clinician did not know/learn about the provided medicine and prescribed more. The CHW noticed this and got in touch with the clinician to check if the patient should indeed take both the medication from the hospital as well as the medication from the IC3 clinic. This prevented an overdose.

The scenarios were developed by me, based on some events that were mentioned by stakeholders during the interviews for the observational study (Chapter 5), the observations (Chapter 5) or during the co-design activities (Chapter 6). Before writing them down I discussed the ideas with the CHD and CHW Programme Manager. I encouraged them to adapt the scenarios as they saw fit. One of the scenarios was read out and CHWs were asked to comment on the scenario, before the next one was read out. The scenarios are presented in box 1.

At the end of each month the Site Supervisors in each catchment area collected the submitted LfE forms from the boxes. The forms were submitted to the RA together with the monthly report, providing a collation of data collected during the monthly household and supervision visits. The RA scanned the forms and translated the answers to the question 'why do you consider this an excellent event'. The scanned forms and translations were uploaded to a shared folder on the M: Drive of the University of Warwick. This continued for the three months of this study.

The RA encouraged Site Supervisors from sites where few LfE forms were submitted in September and/or October 2020. When the RA identified a low number of forms, they contacted the Site Supervisor and asked them if they needed additional support. Furthermore, the CHW Programme Officers and Site Supervisors encouraged CHWs to participate in LfE during the pay-day, at the end of each month.

7.4 Results

7.4.1 Pilot

An overview of the reported excellent events is shown in table 11, while table 12 provides an overview of who participated in the intervention and how often CHWs were reported. As shown, many CHWs reported each other for excellence. Based on the answers to the 'why is this excellent' question, it was unclear if the CHWs were reporting excellence or everyday performance, i.e., many CHWs would repeat the type of excellent event their colleague had performed, instead of explaining why this event in particular was excellent. However, we did believe CHWs understood the form itself as we did not identify odd or unexpected answers to the questions on the form. While CHWs often did not provide additional detail, everyone's explanation provided to the 'why is this excellent' question seemed to match with their answer provided to the 'What excellent event did the CHW perform' question.

Furthermore, CHWs only asked a few questions during pay-day and provided mainly positive feedback to the Site Supervisor, which led us to believe they understood the LfE intervention and knew what was expected of them. We decided not to adapt the forms as this did not seem necessary at the time, however we, the CHW Programme Manager, CHD, and I, decided to adapt the implementation process and discuss what was considered excellence, as we were uncertain if the CHWs really reported excellence and introduced scenarios, as presented in box 7.1

Table 11 Overview of reported excellent events in pilot, presented in alphabetical order.

Type of excellent event	Site A n (%)
Advocated for client	0 (0%)
Checked multiple	0 (0%)
Counselled on treatment adherence	6 (28.6%)
Made a timely referral	2 (9.5%)
Performed three PNC visits	1 (4.8%)
Psychosocial support during hospital stay	0 (0%)
Referred household to POSER	2 (9.5%)
Referred suspected malnutrition cases	1 (4.8%)
Regular sputum submission	2 (9.5%)
Supported attendance ANC visit in the first trimester	2 (9.5%)
Supported attendance of FP	0 (0%)
Supported patient to go back into care	2 (9.5%)
Other, please specify	3 (14.3%)
Total	21

ANC = Antenatal Care
FP = Family Planning
PNC = Postnatal Care
POSER = Programme on Social and Economic Rights

Together with the CHW Programme Manager and the RA, three reports were chosen for follow-up from the pilot. The RA got in touch with the CHWs who were reported, and the CHWs who reported them for the excellent event. Four CHWs participated in the follow-up process, the reporting CHW and the reported CHW for one form, and the reported CHW, as well as the CHW who reported for the other forms respectively.

The other CHWs who were involved were unreachable or declined to participate. An overview of the reports that were followed up is presented in table 13. The RA asked the CHWs the questions as presented 7.3.3.

Table 12 Overview of who participated in the LfE intervention.

	Site A n (%)
Number of CHWs submitting a report	15 (93.8%)
Number of reports submitted by CHWs	16
Number of SCHWs submitting report	4 (100%)
Number of reports submitted by SCHWs	5
Number of reports involving CHWs reporting each other (n)	12 (55%)
(S)CHWs reported once (n)	14
(S)CHWs reported twice (n)	2
(S)CHWs reported three times (n)	1

CHW = Community Health Workers
SCHWs = Senior Community Health Workers

During the follow-up, a CHW who reported a colleague for excellence mentioned that they did so as the reported CHW really went above and beyond for the baby in one of their assigned households as they worried the mother had given up. The CHW who excelled mentioned that they continued to encourage the baby's mother to attend hospital appointments and to continue feeding the baby Ready To Use Therapeutic food, as they were worried the mother was going to give up.

During the follow-up of another form a CHW who was reported for excellence, mentioned that due to the training provided by PIH they were able to notice early signs of labour. After birth the CHW followed up on the new mother and referred and accompanied them to the hospital.

For the final form the reporting CHW mentioned they were inspired by the reported CHW, who went above and beyond and referred a family to the Programme on Social and Economic Rights (POSER) to help the family with food and housing. The reporting CHW learnt that it was good to take initiative and organise support for vulnerable families.

After the pilot it was as of yet unclear what the feedback loop should look like and what should be given to CHWs who were reported for excellence, i.e., a small certificate, just praise in public, or an extra snack. It was again decided to postpone design of feedback.

Table 13 Overview of followed-up reports.

Type of event	Translated explanation
Other, please specify	CHW managed to save a life of a malnourished baby, and this motivated a lot of people around the village upon looking at her effort on the baby. CHW encouraged and advised a client who had a malnourished baby to start giving them soya porridge, well known as (Likuni phala).
Other, please specify	CHW played a big role of saving a life of the baby who could have died if there was no immediate assistance. CHW took part in taking care of the baby after being discharged from the hospital. CHW escorted a client who had given birth to a premature baby to the hospital to receive assistance and was making an effort of visiting them every day whilst at the hospital.
Referred a vulnerable household to POSER/other relevant services	CHW excelled because they took own initiative by referring a vulnerable family to POSER for assistance whereby they have renovated their house and provided them with goats which has improved their social welfare.

CHW = Community Health Worker
POSER = Programme on Social and Economic Rights

7.4.2 Roll-out outcomes

An overview of the outcomes of the LfE intervention is provided in Chapter 8 and 9. Chapter 9 will also provide information about how the implementation process could be improved upon.

In January 2021 the CHW team at Site F selected 11 reports for follow-up: seven reports from upper Neno and four reports from lower Neno. Follow-up was conducted by the CHW Programme Officers. Follow-up in upper Neno was conducted in the first week of February. Due to COVID-19, the follow-up of selected forms in lower Neno had to be postponed.

7.5 Discussion

I explained the implementation of the pilot as well as implementation of the LfE intervention in the entire district. Between pilot and roll-out the only change we made

was the introduction of scenarios, to prime CHWs about what entailed excellence and what entailed everyday performance.

It was initially planned that I would be present for the implementation of the LfE programme, but due to the COVID-19 pandemic a RA was employed to introduce LfE to the CHWs, together with the CHW Programme Officer. The RA was from Malawi and spoke Chichewa, which allowed them to answer questions from CHWs directly and potentially CHWs may have felt more comfortable asking questions to the RA, or the CHW Programme Officers, who were well known by the CHWs and Site Supervisors. Both the RA and the CHW Programme Officer implemented LfE in seven catchment areas and their influence during implementation may have led to variation across sites in how the programme was explained and implemented. I tried to limit variation by explaining the implementation process, but more standardised implementation would have been ideal. I have no experience in coordinating implementation, not on the ground, nor from abroad. Not being there made it difficult to react to last-minute changes in plans or to answer questions from CHWs and Site Supervisors.

Additionally, due to the COVID-19 pandemic the LfE intervention was postponed by three months, to allow everyone to adapt to the new situation. We initially intended to implement LfE as part of the mHealth application, which would have allowed CHWs to report on excellent events at any point in time, an advantage I identified in the exploratory study (15). In the mHealth intervention a feedback loop, informing CHWs who had been reported for excellence, could have been introduced. However, due to the COVID-19 pandemic the intervention was implemented on paper, which allowed me to implement it in the entire district, instead of in Site F and Site G only.

I have never coordinated the implementation of an intervention before, let alone from a distance. The co-design activities, as described in Chapter 6, ensured stakeholders were familiar with the LfE intervention and had thorough knowledge about how it could be implemented. I coordinated implementation with the CHD and CHW Programme Manager during the evaluation of the pilot. Additionally, the RA on the ground had a thorough knowledge of the LfE intervention and encouraged Site Supervisors, as well as CHWs, to participate. At this point in time the RA was volunteering for PIH, and they were in regular contact with the Site Supervisors and Programme Officers. This allowed the RA to encourage them to participate in the LfE programme.

However, Site Supervisors may have felt coerced to participate in the programme due to the RA's role, working as a volunteer for PIH.

As will be shown in Chapter 8, there were some differences between the sites regarding number of forms submitted, which may have been due to implementation not being tailored to different Site Supervisors and different sites. For example, while the Site Supervisor of Site F and Site G were involved in the LfE intervention at various stages, other Site Supervisors had only seen me during the Site Supervisor meeting in October 2019. This may have led to them not fully grasping the intervention, which may have impacted its implementation.

While the follow-up aspect of the intervention was implemented, no feedback was provided to those who were reported for excellence, as this aspect of the LfE programme had not yet been designed, as explained in Chapter 6.

7.6 Conclusion

The LfE intervention was piloted, and after introduction of scenarios, rolled out in all catchment areas in Neno District. After the pilot the implementation of the LfE intervention was adapted slightly, as scenarios were introduced to discuss excellence versus everyday performance with CHWs. Due to the COVID-19 pandemic implementation had to be adapted. Fortunately, stakeholders were familiar with the LfE intervention and understood it well, due to the co-design activities.

CHAPTER 8: LEARNING FROM EXCELLENCE IN NENO DISTRICT

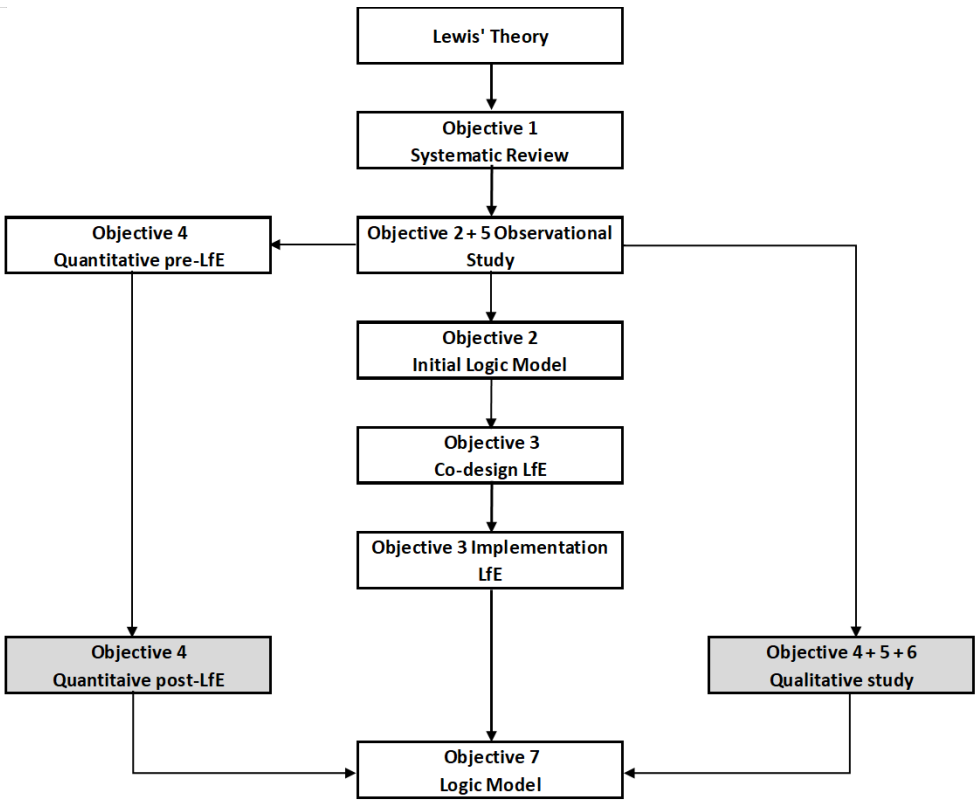
8.1 Introduction

In June 2020 the pilot of the Learning from Excellence (LfE) intervention started in one catchment area in Neno District, Site A, and in September 2020 the co-designed LfE intervention was implemented in all other catchment areas in Neno District, as explained in Chapter 7. In this chapter I will present an overview of the LfE forms that were submitted between September and November 2020. I will also evaluate the co-designed LfE reporting form based on the reported events.

8.2 Aim

In this chapter I aimed to identify the outputs of the co-designed LfE intervention for CHWs and to evaluate the co-designed LfE reporting form based on these outputs, as per objective 4 and 6, see figure 29.

Figure 29 Overview of aims and objectives with the focus of this chapter coloured in grey.



LfE = Learning from Excellence

8.3 Methods

The collected LfE forms were analysed with the help of descriptive statistics, and I analysed the translated answers to the question 'why do you think this was excellent' with the help of memos, which summarised the explanations provided per type of excellent event, as well as notes I took while reflecting upon the provided explanations.

8.3.1 Setting

The co-designed LfE intervention was implemented in every catchment area in Neno District, as described in Chapter 7. A full overview of Neno District was provided in Chapter 2.

8.3.2 Participants

All Community Health Workers (CHWs) and senior CHWs (SCHWs) in Neno District could participate in the intervention, as well as anyone else who observed a CHW performing an excellent event. An overview of the roles of CHWs and SCHWs was provided in Chapter 2.

8.3.3 Data collection

There were 16 LfE reporting boxes in Neno District, one in each of the 14 health facilities and two in remote areas, as explained in Chapter 7. All forms collected between September 2020 and November 2020 were eligible for analysis. Every month the Site Supervisors would open the LfE boxes in their catchment area and collect the reported forms. These forms would be sent to the Partners in Health (PIH) District Health Office (DHO) together with the monthly performance report of the catchment area in question. At the DHO the forms were collected by the research assistant (RA) who was employed for implementation, follow-up of forms reported in the pilot site, and data collection during the first three months of the LfE intervention, as described in Chapter 7 section 7.3.1. The RA oversaw data collection and scanned the forms and uploaded them to a shared folder on the M: drive of the University of Warwick. The RA also translated the answers provided to the question 'why was this excellent'. The translations were collated and uploaded into the shared folder.

The following information from the forms and translations was extracted and collated into an Excel file:

- Name of the CHW reporting.
- Name of the CHW reported.
- Site where excellent event occurred.

- Type of excellent event.
- Translated explanation of why this excellent event was reported.

Once all data were collected, the data file was anonymised and names of CHWs replaced with unique codes. An overview of the names with the corresponding codes was kept in a password protected file on a D: drive of the University of Warwick.

To calculate the percentage of CHWs participating in the LfE intervention in each catchment area, an overview of the total number of CHWs per catchment area as per October 2020 was shared by PIH.

8.3.4 Analysis.

8.3.4.1 Quantitative

I looked at the number of reports per site and the type of excellent events that were reported at each site. Additionally, I identified the percentage of CHWs and SCHWs at each site that submitted an LfE form, including the number of forms they reported. I identified how often CHWs were reported for excellent events, and I identified if CHWs reported each other for excellence: i.e., CHW A reports CHW B and the other way around.

8.3.4.2 Qualitative

The translated explanations as provided in the reports were organised per excellent event they belonged to, e.g., 'made a timely referral'. I took notes about my thoughts while going through the explanations, and the notes, together with the explanations were summarised into memos explaining the explanations provided per type of excellent event.

8.4 Results

8.4.1 Quantitative

Between September 2020 and November 2020, a total of 555 LfE forms were submitted at 13 sites as shown in table 14, which provides an overview of these reports.

At site N no reports were submitted, and this site is thus not included in analysis. Reasons for lack of reports were explored in the mixed method evaluation, presented in Chapter 9. The number of reports submitted varied from six at Site I, to 147 at site G. Of the 555 submitted reports, 123 (22.2%) included multiple excellent events. The percentage of reports containing multiple excellent events varied from 2.9% (n=1) at site K to 50% (n=3) at Site I.

Table 14 Overview of type of excellent event report, in alphabetical order, n (% within site).

Type of excellent event	Site													
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**Total**
Advocated for client	0 (0%)	1 (7.7%)	5 (8.1%)	1 (3.2%)	3 (6.4%)	2 (5.7%)	17 (11.6%)	1 (7.7%)	0 (0%)	5 (9.4%)	1 (2.9%)	4 (9.5%)	4 (7.0%)	**44 (7.9%)**
Counselled on treatment adherence	2 (14.3)	1 (7.7%)	7 (11.3%)	8 (25.8%)	11 (23.4%)	5 (14.3%)	24 (16.3%)	0 (0%)	0 (0%)	5 (9.4%)	6 (17.1%)	3 (7.1%)	12 (21.1%)	**84 (15.1%)**
Timely referral	3 (21.4%)	2 (15.4%)	2 (3.2%)	3 (9.7%)	5 (10.6%)	5 (14.3%)	17 (11.6%)	0 (0%)	3 (50%)	5 (9.4%)	3 (8.6%)	2 (4.8%)	12 (21.1%)	**62 (11.2%)**
Performed three PNC visits	0 (0%)	1 (7.7%)	3 (4.8%)	1 (3.2%)	3 (6.4%)	1 (2.9%)	18 (12.3%)	0 (0%)	0 (0%)	6 (11.3%)	3 (8.6%)	2 (4.8%)	3 (5.3%)	**41 (7.4%)**
Psychosocial support during hospital stay	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.7%)	0 (0%)	0 (0%)	3 (5.7%)	0 (0%)	0 (0%)	1 (1.8%)	**5 (0.9%)**
Referred household to POSER	1 (7.1%)	1 (7.7%)	3 (4.8%)	1 (3.2%)	2 (4.3%)	2 (5.7%)	4 (2.7%)	1 (7.7%)	0 (0%)	1 (1.9%)	1 (2.9%)	0 (0%)	4 (7.0%)	**21 (3.8%)**
Referred suspected malnutrition cases	0 (0%)	0 (0%)	5 (8.1%)	0 (0%)	1 (2.1%)	1 (2.9%)	3 (2.0%)	0 (0%)	0 (0%)	0 (0%)	2 (5.7%)	1 (2.4%)	3 (5.3%)	**16 (2.9%)**
Regular sputum submission	0 (0%)	0 (0%)	3 (4.8%)	0 (0%)	2 (2.1%)	3 (8.6%)	5 (3.4%)	1 (7.7%)	0 (0%)	0 (0%)	7 (20.0%)	4 (9.5%)	3 (5.3%)	**28 (5.1%)**
Supported attendance of FP	2 (14.3%)	1 (7.7%)	4 (6.5%)	3 (9.7%)	4 (8.5%)	2 (5.7%)	11 (7.5%)	1 (7.7%)	0 (0%)	5 (9.4%)	1 (2.9%)	2 (4.8%)	0 (0%)	**36 (6.5%)**
Supported patient to go back into care	1 (7.1%)	1 (7.7%)	4 (6.5%)	1 (3.2%)	1 (2.1%)	2 (5.7%)	8 (5.4%)	1 (7.7%)	0 (0%)	16 (30.2%)	1 (2.9%)	3 (7.1%)	5 (8.8%)	**44 (7.9%)**
Supported client for ANC visit in the first trimester	3 (21.4%)	3 (23.1%)	1 (1.6%)	0 (0%)	4 (8.5%)	1 (2.9%)	10 (6.8%)	1 (7.7%)	0 (0%)	2 (3.8%)	4 (11.4%)	3 (7.1%)	1 (1.8%)	**33 (6.0%)**
Checked multiple	2 (14.3%)	2 (15.4%)	25 (40.3%)	12 (38.7%)	11 (23.4%)	8 (22.9%)	26 (17.7%)	4 (30.8%)	3 (50%)	3 (5.7%)	1 (2.9%)	18 (42.9%)	8 (14.0%)	**123 (22.2%)**
Other, please specify	0 (0%)	0 (0%)	0 (0%)	1 (3.2%)	0 (0%)	3 (8.6%)	3 (2.0%)	3 (23.1%)	0 (0%)	2 (3.8%)	5 (14.3%)	0 (0%)	1 (1.8%)	**18 (3.2%)**
Total	**14**	**13**	**62**	**31**	**47**	**35**	**147**	**13**	**6**	**53**	**35**	**42**	**57**	**555**

ANC = Antenatal Care
FP = Family Planning
PNC = Postnatal care
POSER = Programme on Social and Economic Rights

At site C (40.3%, n=25), site D (38.7%, n=12), site F (22.9%, n=8), site G, (17.7%, n=26), site H (30.8%, n=4) and site L (42.9%, n=18) the most often reported excellent event regarded multiple excellent events.

Commonly reported excellent events included 'counselling client on treatment adherence' and 'timely referrals', which consisted of 15.1% (n=84) and 11.2% (n=62) of the excellence reports respectively. On the other hand, 0.9% (n=5) of the reports regarded 'psychosocial report provided during hospital stay', which was only reported at site G (0.7%, n=1), site J (5.7%, n=3) and site M (1.8%, n=1).

Table 15 provides an overview of reports submitted by CHWs. There were 312 CHWs, from 13 sites, who submitted 416 reports. The percentage of CHWs filling in a report, of the total number of CHWs at the specific site, varied from 5.9% (n=6) in site I to 96.3% (n=26) in site C. In total 32.3% of CHWs in Neno District submitted at least one LfE report. At site A, D, E, H, I, L and M only one report was submitted by the CHWs who submitted an excellence report. At the other sites some CHWs submitted multiple reports, with most reports per CHW submitted in site G where 49 CHWs submitted 110 reports.

An overview of SCHWs who submitted LfE reports is provided in table 16. In total 47.0% of SCHWs working in Neno District submitted a report and there were 105 reports submitted by 78 SCHWs. At the sites where SCHWs submitted a report the percentage of total SCHWs who submitted a report varied between 12.5% (n=1) in site B to 86.7% in site K (n=13). In site C 116.7% (n=7) of SCHWs reported, which was likely due to an error in filling in the form. In sites A, D, E and L the SCHWs who submitted a report all submitted one report while at the other sites the SCHWs submitted multiple reports.

The role of the person submitting a report was unknown for 34 reports, 6.1% of the total number of reports, as shown in table 17. At site A, B, C, D and I, every report contained the role of the person submitting the report. At the other sites the percentage of reports submitted by unknown roles varied between 2.4% (n=2) at site L and 14.3% (n=5) at site F.

Table 15 Overview of CHWs reporting excellent events between September 2020 and November 2020.

Site	Number of CHW submitting a report (n)	Number of reports submitted by CHW (n)	Percentage of CHW submitting report per total number of CHWs (%)	Total number of CHWs (n)[a]
A	12	12	75.0%	16
B	8	11	18.6%	43
C	26	49	96.3%	27
D	25	25	27.5%	91
E	37	37	37.4%	99
F	21	25	18.1%	116
G	49	110	63.6%	77
H	9	9	19.2%	47
I	6	6	5.9%	101
J	27	39	32.5%	83
K	16	17	19.5%	82
L	31	31	41.3%	75
M	45	45	40.1%	110
Total	**312**	**416**	**32.3%**	**967**

1. As per 22-10-2020
CHW = Community Health Worker

Table 16 Overview of SCHWs reporting excellent events between September 2020 and November 2020.

Site	Number of SCHW submitting a report (n)	Number of reports submitted by SCHW (n)	Percentage of total SCHW submitting report per total number of SCHWs (%)	Total number of SCHWs (n)[1]
A	2	2	50%	4
B	1	2	12.5%	8
C	7	13	116.7%*	6
D	6	6	46.2%	13
E	6	6	37.5%	16
F	4	5	25%	16
G	12	21	63.1%	19
H	2	3	25%	8
I	0	0	0%	9
J	6	10	40%	15
K	13	17	86.7%	15
L	10	10	55.6%	18
M	9	10	47.4%	19
Total	**78**	**105**	**47.0%**	**166**

1. As per 22-10-2020
* Mistake made in filling in form or new SCHW hired.
SCHW = Senior Community Health Worker

Table 17 Overview of reports submitted by unknown role between September 2020 and November 2020.

Site	Number of reports submitted by unknown role (n)	Percentage of total reports (%)	Total number of reports (n)
A	0	0%	14
B	0	0%	13
C	0	0%	62
D	0	0%	31
E	4	8.5%	47
F	5	14.3%	35
G	16	10.1%	147
H	1	7.7%	13
I	0	0%	6
J	4	7.6%	53
K	1	2.9%	35
L	1	2.4%	42
M	2	3.5%	57
Total	**34**	**6.1%**	**555**

Table 18 provides an overview of SCHWs or CHWs who reported each other for excellence. In total 162 reports, by 27.7% of (S)CHWs participating in the LfE intervention, involved CHWs reporting the person whom they had been reported by. At some sites this happened more often than at others with 89.9% (n=8) of the (S)CHWs participating at site B involved in reporting the same person who they had been reported by, versus 0% of CHWs at site A (n=0).

Most CHWs, 274, were reported for excellence once. However, 63 CHWs were reported twice, 15 were reported three times, 17 four times and six were reported six times, as presented in table 19.

8.4.2 Qualitative

Table 20 provides an overview of typical explanations per type of event, as provided by CHWs who filled in a report. The explanations provided for 'other' excellent events, or for forms that included multiple reported excellent events were not consistent and are thus not presented in table 20. However, most events as reported in the 'other' category seemed to regard an event that was similar to one of the other categories listed on the LfE form.

Table 18 CHWs or SCHWs reporting each other for excellence between September 2020 and November 2020.

Site	Number of reports involving (S)CHWs reporting each other (n)	Number of (S)CHWs involved in reporting each other	Percentage of (S)CHWs participating in LfE reporting each other (%)	Total number of (S)CHWs participating
A	0	0	0%	14
B	8	8	89.9%	9
C	21	15	45.5%	33
D	8	8	25.8%	31
E	10	10	23.3%	43
F	16	14	64.0%	25
G	66	36	59.0%	61
H	2	2	18.2%	11
I	2	2	33.3%	6
J	17	11	33.3%	33
K	2	2	6.9%	29
L	6	6	14.7%	41
M	4	4	7.4%	54
Total	**162**	**108**	**27.7%**	**390**

1. As per 22-10-2020.
CHW = Community Health Worker
SCHW = Senior Community Health Worker

Table 19 Number of excellent event reports per CHW reported between September 2020 and November 2020.

Site	CHWs reported once	CHWs reported twice	CHW reported three times	CHWs reported four times	CHWs reported five times
A	12	1			
B	8	1	1		
C	10	18	4	1	
D	30				
E	39	4			
F	32		1		
G	29	11	6	14	3
H	11	1			
I	6				
J	19	10		2	1
K	17	4	1		1
L	27	5			1
M	34	8	2		
Total	**274**	**63**	**15**	**17**	**6**

CHW = Community Health Worker

In the main, there were three types of explanations provided on the forms where CHWs checked multiple boxes: 1.) Explanations mentioned the hardworking nature of the CHW, 2.) One of the checked events was explained, 3.) All (or more than 1) of the checked events was explained. A few of the explanations provided in the forms with multiple checked boxes regarded CHWs supporting mental health patients, which did not come up in any of the other explanations. Apart from these typical explanations, some explanations included details about the client and/or the outcome of the excellent event, e.g., patient is healthy again.

While I tried to identify differences per site in terms of explanation provided, I did not notice any. It did seem like explanations in some sites were less specific than in other sites, and included fewer details, but this differed widely per type of event, and I did not identify a pattern.

The explanations as provided for the 'advocated well on behalf of patient' differed from what we had in mind during the design of the form, namely, to report CHWs who advocated on behalf of a patient when visiting the health facility. In reality, most explanations regarded 'encouraging a patient to attend a hospital for treatment or to stick to the treatment regime as prescribed'. Explanations as provided for 'counselling a patient on treatment adherence' as well as 'supporting a defaulting patient back into care' also regarded CHWs encouraging a patient to attend the hospital for treatment or to stick to treatment regime as prescribed. While I did not evaluate CHWs' understanding of the form, it seems like the latter two categories were interpreted in a similar way by CHWs and should potentially be merged.

Some explanations seemed to regard a different event from the one ticked in the boxes. It may be that the CHWs checked the wrong box or wanted to add some additional information about the excellent performance of the CHW in question. Several reports mentioned how hardworking the reported CHW was. In a few cases it seemed like the CHW who was reported for excellence was reported twice, by different reporters, for the same event.

While some reports regarded the relationships between SCHWs, Site Supervisors and CHWs as well as between the CHWs and their clients, only one report mentioned the relationship between CHW and a community member, in this case the headman of the village.

Finally, two reported events regarded COVID-19: one for sputum submission during the pandemic and one regarding a CHW who counselled the family of a potential patient.

Table 20 Typical explanations as provided on the LfE forms as submitted by CHWs between September 2020 and November 2020.

Excellent event	Typical example
Advocated well on behalf of the client	Encouraged a client who was reluctant to seek medical attention to go to the hospital for assistance where [client] was diagnosed with [illness] and started receiving treatment.
Counselled a client on treatment adherence	Advise and encourages a client to be taking medication every day and as prescribed.
Made a timely referral	Saved a life of a patient who was very ill by referring them to the hospital in good time for assistance.
Performed three postnatal care visits	Followed up on a woman who had just given birth, for three consecutive times.
Provided psychosocial support to client during admission and/or hospital stay	Managed to give encouragements to a client who was admitted at the hospital.
Referred a vulnerable household to POSER/other relevant services	Connected a certain family in [CHWs'] village with POSER department to receive assistance.
Regularly refer suspected malnutrition cases	Excelled on the part of referring a child whom CHW was suspecting to be malnourished to the hospital where the child was put on special diet.
Submit client's sputum on a regular basis	[CHW] is excellent when it comes to frequent sputum collection and sending to the hospital for analysis.
Supported a client to attend family planning services	Encouraged a woman to start using family planning methods.
Supported a defaulting patient to go back into care	Encouraged a client who had stopped taking medication in the right way to start taking the drugs by following the right prescription.
Supported a pregnant woman to go for an antenatal care visit in the first trimester	Encouraged an expectant mother to start antenatal care in her first trimester.

CHW = Community Health Worker
POSER = Programme on Social and Economic Rights

8.5 Discussion

Many CHWs participated in the LfE intervention in the first four months of implementation, however there was variation in participation among the different catchment areas, with more CHWs participating in some areas than in others. Most excellent reports regarded multiple excellent events as performed by the reported CHW.

‘Timely referral’ and ‘counselling a client on treatment adherence’ were the most regularly reported excellent events, whereas ‘providing psychosocial support during hospital stay’ was least often reported.

I was uncertain how well CHWs understood the forms. While many of them participated in the LfE intervention, we did not intend for multiple events to be reported on one form. Additionally, ‘advocating on behalf of the client’, ‘counselling on treatment adherence’ and ‘supporting a defaulting patient back into care’, all included similar explanations, indicating that CHWs may not be able to distinguish between these types of excellent events. It could be considered to merge ‘supporting a defaulting patient into care’ and ‘counselling a client on treatment adherence’ into one type of excellent event. The ‘advocating on behalf of a client’ event should be further explained to CHWs, so they are reminded of the type of event that the form is referring to.

Only SCHWs and CHWs participated in the intervention, while we aimed to open up reporting for everyone who noticed excellence of CHWs. It may be that others did not know of the existence of the intervention and did thus not participate. Another option may be that the forms were not easily accessible for those who are based at the District or Community Hospitals.

The translations provided often merely repeated the type of event that was reported and did not include further explanation for why the CHW decided to report these events, making it difficult to use these events for further learning. However, the CHW team at the DHO have identified some events for follow-up, to learn more from what happened.

To my knowledge no study has been conducted regarding the forms used for the LfE intervention, making it difficult to compare these results to existing literature. In the mixed method evaluation, some of the reasons for why at certain areas more reports were submitted than in others, or why in some catchment areas CHWs seemed to report each other more often than at other sites, will be explored.

8.6 Conclusion

Many CHWs participated in the LfE intervention between September 2020 and November 2020. Most reports included multiple excellent events being reported at once. Popular excellent events included ‘timely referral’ and ‘counselling on treatment adherence’, while ‘providing psychosocial support to a client during hospital stay’ was

least often reported. Many CHWs were reported by the same person they reported for excellence and while almost all CHWs provided further explanation about the excellent event many explanations merely repeated the type of event that occurred. Many CHWs included multiple events on one form and as explanations regarding certain events were very similar, the co-designed LfE forms should potentially be adapted to decrease confusion regarding the different types of events that are reported.

CHAPTER 9: MIXED METHOD EVALUATION STUDY

9.1 Introduction

The Learning from Excellence (LfE) intervention was implemented in all 14 catchment areas of Neno District during pay-day in August 2020, as described in Chapter 7. In this Chapter I will describe the mixed method evaluation study that I conducted to learn more about the impact of the intervention on Community Health Workers (CHWs), as well as to identify factors that facilitated or prevented impact from happening. I also gathered information about how the LfE intervention could be adapted to sustain positive outcomes and/or achieve better results in the future. Data were synthesised into a logic model, explaining the impact of LfE on performance of CHWs in Neno district.

9.2 Aim

The aim of this study was to assess the impact of the co-designed LfE intervention on CHWs in Neno District, and to adapt the logic model, as developed in Chapter 5, with the help of the outcomes of this assessment, in order to explain how the co-designed LfE intervention impacts performance of CHWs in Neno District, as per objective 4, 5, 6 and 7. See figure 30 for how this aim fits with the other objectives of this thesis.

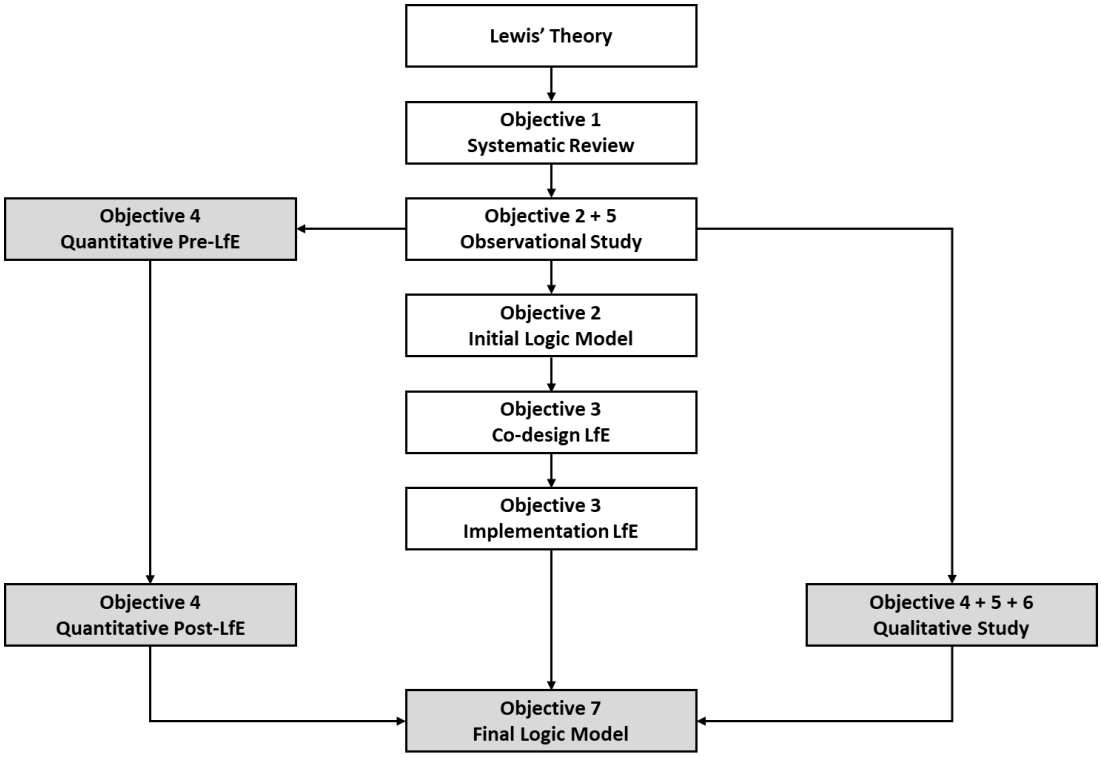
9.3 Methods

9.3.1 Overview

A mixed-method evaluation study was conducted to evaluate the impact of the co-designed LfE intervention on performance of CHWs. I chose a mixed-method design to collect information about outcomes, as well as about mechanisms and contextual factors that facilitate or prevent these outcomes. By collecting different, complementary data I hoped to get a more complete understanding of the impact of the LfE intervention, as compared to understanding created by only collecting quantitative or qualitative data. With the help of the quantitative data, I assessed the impact of the co-designed LfE intervention on CHW motivation and perceived supervision. With the help of qualitative data, I performed semi-structured interviews, I hoped to provide further explanation regarding mechanisms and contextual factors that led to the quantitative outcomes, as well as to identify unexpected outcomes that were not present in the initial logic model, presented in Chapter 5. I used a convergent mixed method

design, and quantitative and qualitative data were collected and analysed separately (265). This design was chosen due to time constraints. After separate analysis, the data were converged into the logic model, with the help of developed context-mechanism-outcome configurations (CMOCs) explaining how LfE impacted organisational performance of CHWs.

Figure 30 Overview of aims and objectives with the focus of this chapter coloured in grey.



LfE = Learning from Excellence

9.3.2 Setting

Initially I planned to implement the co-designed intervention in two of the 14 catchment areas in Neno District, Site F and Site G, because CHWs in these areas used a mobile health (mHealth) application to conduct their work. Due to the COVID-19 pandemic it was not possible to integrate the LfE intervention into the mHealth application, as explained in Chapter 7, but this allowed us to implement the LfE intervention in the entire district as a paper-based intervention. An overview of the research setting was provided in Chapter 2.

Baseline quantitative data collection took place in January 2020, before the COVID-19 pandemic, when the project was still focused on Site F and Site G. As I only had

baseline data from these catchment areas, and as the intention was to assess changes over time, post-intervention quantitative data were only collected at these sites.

9.3.3 Quantitative data collection

9.3.3.1 Participants

In each site 25 CHWs and SCHWs were included in the study. This was based on a very crude power calculation with a power of 0.8, alpha of 0.05 and a medium effect size of 0.5 for the outcome change (calculated before outcome variables were chosen) which returned a minimum of 34 participants to complete both the baseline and the post-intervention questionnaire, using paired data. While Site F and Site G are different sites, they were considered comparable as both sites have the same CHW programme, including the same management. Both sites are large, with 132 and 96 CHWs respectively and both sites are situated in the more mountainous upper Neno, within a two-hour drive from one another.

As I expected some drop-out between pre- and post-intervention data collection, I included 50 CHWs in the baseline questionnaire of which 25 were based in Site F and 25 were based in Site G.

Participants were selected by the Site Supervisor, who invited participants to participate upon their arrival at pay-day. I did not provide any selection criteria and asked the Site Supervisors to select CHWs at random.

9.3.3.2 Questionnaire Development

Data were collected with the help of a self-designed questionnaire consisting of ten questions. The questionnaire was designed in collaboration with Partners in Health (PIH) after my initial visit to Neno District in October 2019.

The starting point for questionnaire development was the logic model explaining the impact of LfE for health personnel in the United Kingdom (UK), as developed in an exploratory study about the impact of LfE on National Health Service (NHS) Hospital trusts in the UK (15), and the outcomes of the Systematic Review in Chapter 4 (181).

The exploratory study identified intermediate outcomes including culture change, increased retention rates, social capital, positive emotions and strengths (15). Additionally, in the systematic review the following intermediate outcomes were identified: reduced burnout, increased confidence, improved service user perspective, improved work practices, improved attitudes to work (including motivation and morale), and

high-quality relationships (181). The systematic review also identified the intermediate outcomes of reduced attrition rates, positive emotions, and strengths, which were identified in the exploratory study as well (181). All these outcomes are believed to feed into improved organisational performance, as per the logic models that were developed. During the co-design activities, as described in Chapter 6, improved CHW motivation and morale, improved sense of community among CHWs, improved CHW retention and supportive mentorship and increased CHW capacity as LfE acts through supportive mentorship.

Through discussion with stakeholders (Chief Medical Officer (CMO), Chief Health System's Advisor (CHSA) and Community Health Director (CHD), I identified the following two outcomes we wanted to look at for CHWs in Neno District: motivation, including general motivation, organisational commitment, and job satisfaction; and perceived supervision, which was similar to supportive mentorship. Motivation was chosen as it had been previously identified as potential outcome of LfE or interventions like LfE (Chapter 4) (15, 198). Perceived supervision was chosen due to the previously identified 'breaking down of hierarchies', 'feeling of community' and 'high-quality relationships' (15, 198), as well as the expectation that LfE could lead to supportive mentorship. It was believed that the LfE programme could potentially strengthen relationships between CHWs and SCHWs. We initially aimed to integrate the LfE intervention into the mHealth application used by CHWs in Site F and Site G. While not discussed in co-design activities themselves, as described in Chapter 6, in October 2019 stakeholders in the CHW team and I hypothesised that with the help of the mHealth application, SCHWs would be notified about excellence reports submitted about CHWs they were supervising. This would provide the SCHWs with additional information about CHW performance, as well as about what the CHW does well, which was believed to lead to better targeted supervision. Improved perceived supervision was thus considered a relevant outcome of the LfE intervention.

As CHWs have limited education stakeholders advised me not to include more than ten questions in the questionnaire to keep the questionnaire feasible for the CHWs. The questions in the questionnaire had to be as simple as possible, so as not to confuse the CHWs.

Once outcomes were chosen, I performed a literature search to identify validated questionnaires measuring the chosen outcomes in CHWs. I hoped to identify questionnaires that were validated for health workers in Malawi, but if this was not the case, I aimed to include questionnaires that were validated for CHWs in sub-Saharan Africa to help ensure the concepts were understood by and represented motivation and/or perceived supervision of the target population, CHWs. I identified three questionnaires that measured the chosen outcomes. The first questionnaire regarded a tool to measure motivation of health workers in district hospitals in Kenya (266). The same questionnaire was also used in a study measuring motivation of health workers in rural health facilities in Zambia, a setting similar to Malawi (267). Together with PIH I chose six questions from this questionnaire to measure the following motivation components: general motivation (three questions), organisational commitment (two questions), and job satisfaction (one question). The job-satisfaction component of this questionnaire was based on a tool by Bennett et al., developed to measure health worker motivation in developing countries, which was validated in Georgia and Jordan (268) and subsequently used to measure job satisfaction among health workers in Tanzania, Malawi and South Africa (269). We chose one question based on this questionnaire. Perceived supervision was measured with three questions from a tool specifically designed to identify approaches to supervision from the perspective of CHWs. This tool has been validated in seven countries, including Malawi (270).

An overview of the questions including the construct they intend to measure is provided in table 21. Some of the questions from the validated questionnaires were slightly adapted to better match the context of CHWs in Neno District. An overview of adaptations, including reasons, is also provided in Table 21.

Items were scored using a 5-point Likert scale varying from strongly disagree (1) to strongly agree (5), as was used in the validated questionnaires that we used to develop ours. PIH stakeholders mentioned that in the past CHWs struggled to understand the spaces between the different answer options, e.g.., agree and strongly agree. They suggested to use emoticons to explain the different answer options, which is what we did. The final version of the English questionnaire is presented in figure 31. The questionnaire was translated into Chichewa, and back translated into English to check for validity.

Table 21 Questions for questionnaire.

	Question	Construct	Adapted	Reason for adaptation
1 (267)	In general, I am very satisfied with my job	Motivation (general motivation)	NA	
2 (269)	I am actively seeking other employment	Motivation (job satisfaction)	If I could, I would do a different job	CHWs have limited education and there are few opportunities for them so we changed it to find out if they would potentially change roles if they could
3 (267)	This health facility really inspires me to do my very best on the job	Motivation (organisational commitment)	I feel my work is appreciated and valued by the SCHW and Site Supervisor	More specific, which was thought to make it easier for CHWs to answer the question
4 (267)	I am proud to be working for this facility	Motivation (organisational commitment)	I am proud to be a CHW	CHWs don't work in a facility, so we focused on their role as CHW
5 (267)	I am not satisfied with my colleagues at work	Motivation (job satisfaction)	I feel part of a Community Health Team	PIH preferred the question to be phrased positively as they expected a more honest response, additionally, we made it more specific
6 (270)	My supervisor meets with me regularly to discuss problems and solutions	Perceived supervision	I feel able to discuss work-related problem with other CHWs and SCHWs	More specific, which was thought to make it easier for CHWs to answer the question
7 (267)	Feel motivated to work hard	Motivation (general motivation)	I feel motivated to work as hard as I can	More specific, which was thought to make it easier for CHWs to answer the question
8 (267)	Only do this job to get paid	Motivation (general motivation)	In only do this job to get paid at the end of the month	More specific, which was thought to make it easier for CHWs to answer the question
9 (270)	My supervisor meets with me regularly	Perceived supervision	The SCHW meets with me regularly	More specific was thought to make it easier for CHWs to answer the question
10 (270)	My supervisor helps me to update my knowledge	Perceived supervision	The SCHW helps me to update my knowledge and skills	More specific was thought to make it easier for CHWs to answer the question. Additionally, not just knowledge but also skills included

CHW = Community Health Worker
NA = Not Applicable
PIH = Partners in Health
SCHW = Senior Community Health Worker

Figure 31 Final questionnaire in English.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I am satisfied with this job					
2	If I could, I would do a different job					
3	I feel my work is appreciated and valued by my supervisor					
4	I am proud to be a CHW					
5	I feel part of the Community Health Team					
6	I can discuss work-related problems with other CHWs and my supervisor					
7	I am motivated to work as hard as I can					
8	I only do this job so I get paid at the end of the month					
9	My supervisor meets with me regularly					
10	My supervisor helps me to update my knowledge and skills					

CHW = Community Health Worker

9.3.3.3 Data collection

Baseline data were collected at pay-day in January 2020. During pay-day all CHWs gather at a site to receive their monthly stipend and some training is provided during this day. I attended the pay-day in Site F, together with the Research Assistant (RA), who had been involved in the observations, implementation of LfE and data collection as described in Chapter 5, 7 and 8. The RA provided instructions to the CHW Programme Officer for upper Neno, who coordinated data collection in Site G.

First the informed consent form was read aloud to CHWs, and they were given the opportunity to ask questions. Subsequently informed consent was obtained and afterwards the questionnaire was read aloud and CHWs were given some time to look through the questionnaire themselves and ask any questions about the questionnaire. The CHW Programme Officer for upper Neno explained this data collection process to one of the Site Supervisors, who coordinated the data collection in Site G.

The post-implementation questionnaire was administered in November 2020. The RA, who assisted in the LfE implementation and data collection process, got in touch with the Site Supervisors from Site F and Site G and they shared the list of participants. Site supervisors subsequently got in touch with the names on the list and asked them to fill in the questionnaire again. The RA was available in case the Site Supervisors or CHWs had any questions. Collected data were anonymised and added to an excel spreadsheet.

9.3.3.4 Data analysis

Unfortunately, due to miscommunication, most of the CHWs in Site F did not write their names on the post-intervention questionnaire. This meant no paired data analysis could be performed for this catchment area.

In January 2021 the final analysis, including the baseline data and the post-intervention data, was performed. Outcomes for question 2 and question 8, the negatively phrased questions were converted, so that for all questions a score of 5 was a high score, while a score of 1 was low. First the internal validity of the questionnaire was checked with the help of inter-question correlations and Cronbach's alpha. I performed descriptive statistics and calculated the median, interpolated median and interquartile ranges for each question, assigning numerical values to each response on the Likert scale from strongly disagree=1 to strongly agree=5. I also calculated the median and interquartile ranges for the constructs assessed by more than one question: motivation and perceived supervision. Finally, I performed a paired data analysis by construct, comparing the baseline questionnaire with the post-intervention questionnaire using a Wilcoxon Signed Rank test for the paired data from Site G. I performed a Mann Whitney U test for the unpaired data from Site F. Stata (v17) was used for data analysis. An overview of the Stata codes that were used for data analyses is provided in Appendix 10.

9.3.4 Qualitative data collection

9.3.4.1 Participants

I selected four stakeholders in the CHW programme for participation in the interviews: CHD, CHW Programme Manager and the CHW Programme Officers for lower and upper Neno. These stakeholders were selected as they had been involved in the roll-out and implementation of the LfE intervention as well as for their involvement in the CHW programme in general.

I also selected seven Site Supervisors to participate. I aimed to ensure diversity among Site Supervisors and the reason for their selection is provided in table 22. For example, the Site Supervisor of Site K was asked to participate due to the high quality of the submitted LfE reports at Site K, while the Site Supervisor for Site I was asked as only six LfE reports had been submitted at Site I.

Fifteen CHWs were selected from three different sites: Site F, Site G and Site K. These sites were selected due to their variation in participation in the LfE intervention and

Site F and Site G participated in the observational study as well. I chose Site G because they were included in the observational study, but also showed many CHWs filling in multiple reports, which I did not identify in other sites. Site K was chosen as the quality of the reports was considered very high, and most reports chosen for follow-up, six out of a total 11, were reported in Site K. By inviting the Site Supervisor for participation, I hoped to learn more about potential facilitating factors for the good understanding of the LfE intervention. Finally, Site F was chosen as this site was included in the observational study, and a very small percentage of CHWs based here participated.

Table 22 Selection of Site Supervisors.

Site Supervisor	Reason for selection
Site A	Pilot site. Large number of CHWs reporting each other, high percentage of CHWs filled in a report.
Site E	Average site, did not stand out.
Site F	Low percentage of CHWs participated in LfE intervention
Site G	CHWs who participated filled in multiple reports
Site I	Low number of reports
Site K	High quality of submitted reports
Site N	No reports

CHW = Community Health Worker
LfE = Learning from Excellence

At each site five CHWs were selected: two who filled in a report, two who were reported and one CHW who did not participate in the LfE project. All CHWs were randomly selected with the help of Excel Random Number generator. If one of the selected CHWs was unwilling or unable to participate, the next CHW on the list was invited.

9.3.4.2 Data collection

Data were collected between the 25th of January 2021 and 5th of February 2021. In total 24 interviews were conducted: 14 interviews with CHWs, seven interviews with Site Supervisors and three interviews with stakeholders. One CHW declined to participate, and one stakeholder was unable to do so due to a lack of time. The RA, who was involved in the observational study, implementation of LfE and collection of forms and quantitative data collection, as previously described, conducted all interviews with CHWs and Site Supervisors, as these were conducted in Chichewa. Except for one

interview, the interviews conducted by the RA were conducted in person and, with consent of the interviewee, recorded and transcribed. One interview was conducted over the phone, as distances were too large. This interview could not be recorded, and the RA took detailed notes. All face-to-face interviews were performed in a quiet place at the health facility. I conducted the three interviews with stakeholders via Microsoft Teams. Interviews were held in English and recorded with permission of the participants.

The RA had limited experience with qualitative data collection and MK organised an online training session in which the RA was trained in basic interviewing techniques, including following up on certain statements that are made by the interviewee and asking participants to elaborate upon their answers. Throughout the interviewing process the RA kept in touch with MK about the interview schedules, questions on behalf of the CHWs and about problems that arose during data collection.

During the interviews the following topics were discussed. A full interview guide is shown in Appendix 11:

- The implementation of the LfE intervention, including strengths, weaknesses, barriers, and facilitators.
- The design of the LfE intervention, including strengths, weaknesses, and recommendations to improve.
- The future of the LfE intervention.
- The impact of the LfE intervention on CHWs and SCHWs including barriers and facilitators.
- Mechanisms to impact of the LfE intervention.
- Contextual factors that play a role in impact of the intervention.
- Recommendations

All recorded interviews were transcribed verbatim and, if held in Chichewa, translated by the RA.

9.3.4.3 Data analysis

To check if I understood the translated interview transcripts sufficiently, I developed memos summarising the Site Supervisor interviews as well as the CHW interviews. The memos were shared and discussed with the RA to check my understanding and identify if I had misunderstood or missed out on something.

I performed a thematic analysis (231). I first familiarised myself with the data, through developing memos of translated interviews and by transcribing and reading through the interviews that I had conducted in English (231). The interviews were subsequently coded in nVivo. Unlike in the observational study, described in Chapter 5, I was unable to print out the interviews, due to COVID-19 and lockdown regulations, and thus did not perform initial coding on paper. Initial coding was performed on a line-by-line basis. If lines contained multiple topics, multiple codes were generated. I reviewed the initial coding and adapted codes if necessary. As per the observational study (Chapter 5), I used *evaluation coding*, labelling the specific positive and negative positions of participants, *sub-coding,* to provide additional detail*,* and *structural coding,* to label and categorise data, allowing me to access it quickly for further analysis, as per the observational study (232). To check for consistency, BH independently coded five randomly selected transcripts. BH and I then discussed our coding and identified similarities and resolved differences.

Once coding was finished similar codes were grouped together to form sub-themes based on similarity (231). The sub-themes were subsequently grouped, again based on similarity, to form themes. A memo was written about each theme to summarise findings. The memos were used to show CB how I arrived at the grouping of codes into sub-themes and themes, as unlike in Chapter 5, there was insufficient time for CB to check the groupings of codes into sub-themes and of sub-themes into themes.

After themes were developed, I identified CMOCs to help me understand causal links between contexts, mechanisms, and outcomes, as explained in Chapter 3 and Chapter 5. The CMOCs helped with development of the logic model. CMOCs were developed on paper and collated based on similarity before I added them into an Excel file, after which they were collated further. The contextual factors were organised into the following categories, as explained in Chapter 3: individual, interpersonal, institutional, and infrastructural, and a table with an overview of the identified CMOCs was made. A distinction was made between negative and positive outcomes.

9.3.5 Data synthesis

The quantitative data were synthesised with the qualitative data in the CMOCs. I compared the qualitative outcomes as mentioned in the interviews, with the quantitative outcomes as measured with the questionnaires. I checked if the quantitative data supported the outcomes of the CMOCs, or not, as per the convergent design of the mixed-

method study (265). As in the systematic review and the observational study, contextual factors were again sub-categorised as follows (202, 204): factors before design and implementation of the intervention (factors present in the organisation that support enthusiasm for interventions), factors during the design (factors that support uptake of the intervention) and factors during the intervention itself (factors that support effectiveness of the intervention).The logic model was adapted to include newly identified factors.

The quantitative and qualitative data were triangulated into a logic model, for which I used the logic model as developed in Chapter 5 as starting point. This logic model was subsequently adapted with the identified CMOCs, thus explaining how LfE can impact CHWs in Neno District, Malawi. I assessed if the outcomes of this evaluation converged with the developed logic model, or if they diverged, in which case the logic model was adapted accordingly.

9.4 Results

9.4.1 Quantitative

9.4.1.1 Participants

A total of 50 CHWs and SCHWs participated in the questionnaire in January 2020 and 46 of them completed the post-intervention questionnaire in December 2020, 23 at each site. While paired data were collected for Site G, due to miscommunication CHWs did not provide their names in the second questionnaire in Site F, making it impossible to pair data.

9.4.1.2 Overview of outcomes

The median, interquartile range and interpolated median scores per question, per site, and in total, before and after the implementation of LfE, are presented in table 23 and 24 respectively. CHWs' scores for the positively phrased questions were very high both pre- and post-intervention. Cronbach's alpha, presented in table 25, was 0.58 for the pre-intervention questionnaire and 0.50 for the post-intervention questionnaire. Table 26 and 27 show the Spearman correlations between the different questions on the questionnaire before and after LfE respectively.

Table 23 Median and interpolated median scores for 10-item questionnaire, by site and total overall, before implementation of Learning from Excellence.

		Site F			Site G			All		
		Median (IQR)	IM	N	Median (IQR)	IM	N	Median (IQR)	IM	N
Motivation	Q1 In general, I am satisfied with this job	5 (5 to 5)	4.88	25	4 (4 to 5)	4.28	25	5 (4 to 5)	4.64	50
	Q2 If I could, I would do a different job	2 (1 to 4)	1.93	24	1 (1 to 2)	1.30	24	1.5 (1 to 2)	NA	48
	Q3 I feel my work is appreciated and valued by the SCHW and Site Supervisor	5 (5 to 5)	4.89	23	5 (4 to 5)	4.54	25	5 (4 to 5)	4.75	48
	Q4 I am proud to be a CHW	5 (4 to 5)	4.81	25	5 (4 to 5)	4.72	25	5 (4 to 5)	4.76	50
	Q5 I feel part of the Community Health Team	5 (4 to 5)	4.81	25	5 (4 to 5)	4.54	25	5 (4 to 5)	4.69	50
	Q7 I feel motivated to work as hard as I can	5 (4 to 5)	4.76	25	4 (4 to 5)	4.38	25	5 (4 to 5)	4.70	50
	Q8 I only do this job so I get paid at the end of the month	4 (3 to 5)	4.08	21	5 (5 to 5)	4.70	24	5 (4 to 5)	4.52	45
Perceived Supervision	Q6 I feel able to discuss work-related problems with other CHWs and SCHW	5 (4 to 5)	4.79	24	5 (4 to 5)	4.76	25	5 (4 to 5)	4.78	49
	Q9 The SCHW meets with me regularly	5 (4 to 5)	4.72	25	5 (4 to 5)	4.67	25	5 (4 to 5)	4.69	50
	Q10 The SCHW helps me to update my knowledge and skills	5 (5 to 5)	4.95	24	5 (5 to 5)	4.88	25	5 (5 to 5)	4.92	49
Total (maximum score is 50)		45 (41 to 47)	44.75	19	41.5 (40 to 45)	NA	24	43 (41 to 46)	43.00	43

CHW=Community Health Worker, IM = Interpolated Median, IQR = Interquartile range, SCHW = Senior Community Health Worker

Table 24 Median and interpolated median scores for10-item questionnaire, by site and total overall, after implementation of Learning from Excellence

		Site F			Site G			All		
		Median (IQR)	IM	N	Median (IQR)	IM	N	Median (IQR)	IM	N
Motivation	Q1 In general, I am satisfied with this job	5 (4 to 5)	4.77	22	4 (4 to 5)	4.33	23	5 (4 to 5)	4.62	44
	Q2 If I could, I would do a different job	2 (1 to 3)	1.30	22	1 (1 to 2)	1.42	22	2 (1 to 3)	1.82	43
	Q3 I feel my work is appreciated and valued by the SCHW and Site Supervisor	5 (4 to 5)	4.70	24	5 (4 to 5)	4.68	23	5 (4 to 5)	4.69	47
	Q4 I am proud to be a CHW	5 (4 to 5)	4.77	22	5 (4 to 5)	4.71	22	5 (4 to 5)	4.73	43
	Q5 I feel part of the Community Health Team	5 (5 to 5)	4.85	22	5 (4 to 5)	4.77	22	5 (4 to 5)	4.82	42
	Q7 I feel motivated to work as hard as I can	5 (4 to 5)	4.82	23	4 (4 to 5)	4.73	23	5 (4 to 5)	4.80	45
	Q8 I only do this job so I get paid at the end of the month	5 (3 to 5)	3.61	23	5 (5 to 5)	4.14	23	4 (4 to 5)	4.09	46
Perceived Supervision	Q6 I feel able to discuss work-related problems with other CHWs and SCHW	5 (4 to 5)	4.82	23	5 (4 to 5)	4.78	23	5 (4 to 5)	4.80	46
	Q9 The SCHW meets with me regularly	5 (4 to 5)	4.81	22	5 (4 to 5)	4.62	23	5 (4 to 5)	4.72	45
	Q10 The SCHW helps me to update my knowledge and skills	5 (5 to 5)	4.95	23	5 (5 to 5)	4.82	23	5 (5 to 5)	4.89	46
Total (maximum score is 50)		45 (43 to 46)	45.00	18	42 (41 to 45)	42.10	20	44 (42 to 46)	44.00	35

CHW=Community Health Worker, IM = Interpolated Median, IQR = Interquartile range, SCHW = Senior Community Health Worker

Table 25 Cronbach α of questionnaire if question is removed.

Concept	Question	Cronbach α	
		Before	After
Motivation	Q1 In general, I am satisfied with this job	0.54	0.44
	Q2 If I could, I would do a different job	0.60	0.55
	Q3 I feel my work is appreciated and valued by the SCHW and Site Supervisor	0.51	0.49
	Q4 I am proud to be a CHW	0.55	0.43
	Q5 I feel part of the Community Health Team	0.57	0.44
	Q7 I feel motivated to work as hard as I can	0.56	0.38
	Q8 I only do this job so I get paid at the end of the month	0.65	0.59
Perceived Supervision	Q6 I feel able to discuss work-related problems with other CHWs and SCHW	0.55	0.59
	Q9 The SCHW meets with me regularly	0.52	0.44
	Q10 The SCHW helps me to update my knowledge and skills	0.55	0.44
Total		0.58	0.50

CHW = Community Health Worker
SCHW = Senior Community Health Worker

It was decided not to include question 2 and question 8, the negatively phrased questions, in the statistical evaluation. For question 2, the Cronbach's alpha if the question was removed increased to 0.60 and 0.55 for pre-LfE and post-LfE respectively. Additionally, the correlations between scores on this question with other questions in the motivation construct was low, ranging from -0.13 to 0.26 pre-LfE and from -0.19 to 0.26 post LfE. For question 8, the Cronbach's alpha if the question was removed increased to 0.65 and 0.59 pre-LfE and post-LfE respectively. Correlations between scores on this question and other questions regarding motivation ranged from -0.21 to 0.12 pre-LfE and from -0.21 to 0.06 post-LfE.

The results of the questionnaire are provided in table 28. The median score for motivation before LfE was 24 (IQR 22 to 25) in Site F, out of a maximum score of 25, and 22 (IQR 21 to 24) in Site G. After LfE the median in Site F was 25 (IQR 23 to 25) and 23 (IQR 21 to 25) in Site G. Change in motivation was only measured for Site G and amounted to 1 (IQR 0 to 1).

Table 26 Spearman correlations between individual question responses questionnaire before implementation of Learning from Excellence, n=43.

		Q1	Q2	Q3	Q4	Q5	Q7	Q8	Q6	Q9	Total Motivation	Total Supervision	Total
Motivation	Q1 In general, I am satisfied with this job	-											
	Q2 If I could, I would do a different job	0.25	-										
	Q3 I feel my work is appreciated and valued by the SCHW and Site Supervisor	0.63	0.26	-									
	Q4 I am proud to be a CHW	0.43	0.17	0.47	-								
	Q5 I feel part of the Community Health Team	0.14	0.14	0.31	0.30	-							
	Q7 I feel motivated to work as hard as I can	0.43	0.19	0.39	0.53	0.11	-						
	Q8 I only do this job so I get paid at the end of the month	-0.11	-0.13	-0.09	-0.21	0.12	0.11	-					
Perceived Supervision	Q6 I feel able to discuss work-related problems with other CHWs and SCHW	0.23	-0.14	0.26	0.12	0.26	0.12	-0.04	-				
	Q9 The SCHW meets with me regularly	0.33	-0.07	0.28	0.37	0.17	0.35	0.19	0.37	-			
	Q10 The SCHW helps me to update my knowledge and skills	0.32	-0.06	0.27	0.03	0.19	0.33	0.26	0.03	0.13			
											0.21	**0.18**	**0.19**

CHW = Community Health Worker
SCHW = Senior Community Health Worker

Table 27 Spearman correlations between individual question responses questionnaire after implementation of Learning from Excellence, n=35.

		Q1	Q2	Q3	Q4	Q5	Q7	Q8	Q6	Q9	Mean Motivation	Mean Supervision	Mean
Motivation	Q1 In general, I am satisfied with this job	-											
	Q2 If I could, I would do a different job	0.36	-										
	Q3 I feel my work is appreciated and valued by the SCHW and Site Supervisor	-0.03	-0.19	-									
	Q4 I am proud to be a CHW	0.55	0.26	-0.26	-								
	Q5 I feel part of the Community Health Team	0.31	0.15	0.18	0.28	-							
	Q7 I feel motivated to work as hard as I can	0.37	0.09	-0.02	0.36	0.41	-						
	Q8 I only do this job so I get paid at the end of the month	-0.11	-0.13	0.06	-0.21	-0.07	-0.05	-					
Perceived Supervision	Q6 I feel able to discuss work-related problems with other CHWs and SCHW	0.02	-0.19	0.01	0.26	0.10	0.22	0.02	-				
	Q9 The SCHW meets with me regularly	0.25	0.00	-0.09	0.25	0.00	0.11	0.00	0.30	-			
	Q10 The SCHW helps me to update my knowledge and skills	0.16	0.22	-0.06	0.25	0.20	0.36	-0.01	-0.01	0.10			
											0.11	**0.13**	**0.11**

CHW = Community Health Worker
SCHW = Senior Community Health Worker

The median on the supervision component was 15 (out of a maximum of 15) (IQR 14 to 15) and 14 (IQR 14 to 15) in Site F and Site G respectively pre-LfE, and 14 (IQR 14 to 15) and 14 (IQR 13 to 15) in Site F and Site G respectively.

No statistically significant differences were identified between pre-and post-LfE measurements, for neither motivation (p=0.86 and p=0.31 for Site F and Site G respectively) or perceived supervision (p=0.95 and p=0.45 for Site F and Site G respectively). Figure 32 and figure 33 provide an overview of the scores before and after implementation of LfE by site.

Table 28 Overview of questionnaire outcomes.

			Site F		**Site G**	
				N		N
Before	Motivation	Median	24	23	22	25
		IQR	22 to 25		21 to 24	
	Supervision	Median	15	23	14	25
		IQR	14 to 15		14 to 15	
After	Motivation	Median	24	19	23	18
		IQR	23 to 25		21 to 25	
	Supervision	Median	14.5	22	14	23
		IQR	14 to 15		13 to 15	
Change	Motivation	Median			1	18
		IQR			0 to 2	
	Supervision	Median			0	23
		IQR			-1 to 1	
Wilcoxon Signed Rank for change	Motivation				p=0.31 (z = -1.01)	18
	Supervision				p=0.45 (z = 0.75)	23
Mann-Whitney U Test for change	Motivation		p=0.86 (z = -0.18)	42		
	Supervision		p=0.95 (z = 0.063)	45		

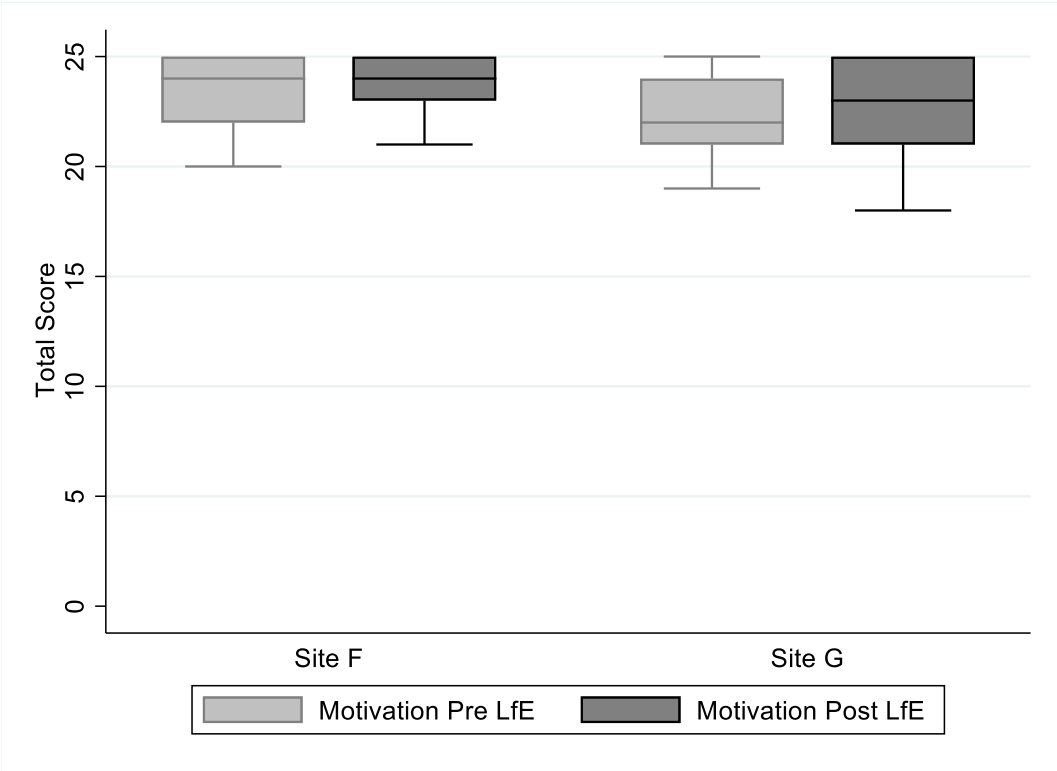
IQR = Interquartile range

9.4.2 Qualitative

The RA interviewed fourteen CHWs, as well as six Site Supervisors, and I interviewed three stakeholders in the CHW programme: the CHD, the CHW Programme Manager and the CHW Programme Officer for upper Neno. Due to connectivity issues the last interview was cut short, and my final questions were answered over email.

I identified seven themes, including appreciation felt by CHWs after introduction of LfE, jealousy experienced among CHWs, outcomes of LfE, facilitators and barriers for participation in LfE, rewards regarding LfE participation and recommendations for the future. All themes are described in more detail below, and a summary is provided in table 29.

Figure 32 Motivation before and after implementation of Learning from Excellence, by site. Maximum score is 25.



9.4.2.1 Appreciation

The opportunity to appreciate CHWs with the help of the LfE intervention was mentioned by CHWs, stakeholders and Site Supervisors. Before LfE was implemented CHWs did not consider their work worthy of praise, however LfE made CHWs realise that their work is worthy of being appreciated. Being appreciated made CHWs feel good, and they were keen to be appreciated, and wanted to be the next person reported for excellence.

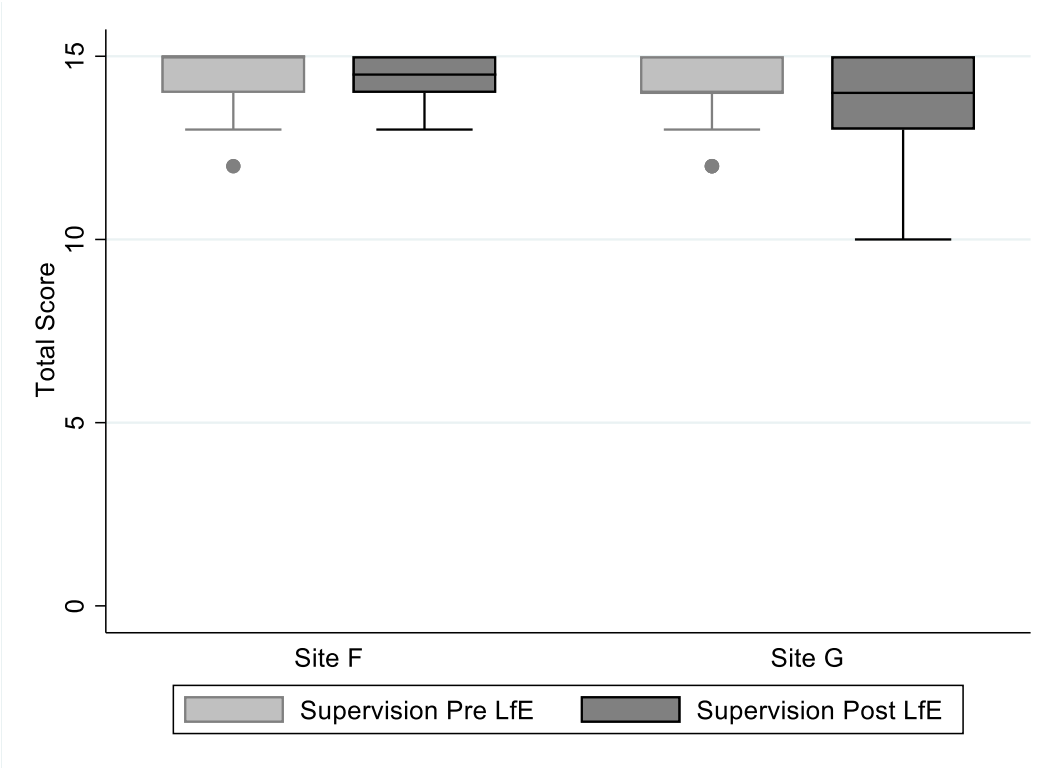
"This all because at first we thought that our organisation can't have such that programme of appreciating each other and just thought that our work is not worth to be appreciated, but this programme brought a different idea in us." – CHW 5

"[...] this is a good programme because it has an element of appreciating someone who has done excellent work at that particular time than anyone else." – CHW 14

Site supervisors mentioned that as LfE, and its potential benefits, targeted CHWs specifically, allowing them to participate freely, as hierarchy did not play as much of a role as it was expected to do when other health workers participated as well.

"[...] the CHWs were appreciating each other freely in a way that the programme was [...] specific targeting them." – Site Supervisor 3

Figure 33 Perceived supervision before and after implementation of Learning from Excellence, by site. Maximum score is 15.



9.4.2.2 Jealousy

Jealousy was mentioned often by CHWs and Site Supervisors as a reason for non-participation in the intervention. A CHW mentioned that if they reported a colleague for excellence it was expected that this colleague would report them for excellence as well, however due to jealousy among them this did not always happen. CHWs were worried that if they reported a colleague for an act of excellence, but were not reported themselves, it would look like the others were doing a better job. One CHW suggested that jealousy among CHWs increased due to the implementation of LfE. To prevent jealousy, a CHW suggested to restrict each other from voting for friends.

"I also think that there are some colleagues of mine maybe who saw those successes in others, but they failed to vote for them because of jealousy." – CHW 7

"[…] many people had a mind-set that if I vote for a colleague then it will look like they are the ones who are doing better jobs than others." – CHW 9

Table 29 Overview of themes.

Theme	Description
Appreciation	CHWs felt appreciated by LfE, which made them feel good.
Jealousy	There was jealousy among CHWs, affecting participation in LfE.
Outcomes	LfE was expected to lead to hard work, improved outcomes for patients and insight into work done by CHWs and improved attitudes to work. However, time since implementation was too short to really identify outcomes.
Facilitators	Site Supervisor encouragement and reminders, support from DHO, acts of excellence by colleagues, potential rewards, availability of forms and boxes and collaboration with a UK institution facilitated uptake of LfE.
Barriers	Lack of understanding by CHWs and Site Supervisors, miscommunication, high workloads, heavy reliance on busy stakeholders and Site Supervisors and changed workflows due to COVID-19 were barriers to uptake of LfE.
Rewards	Various potential rewards were mentioned including in-kind and financial rewards. CHWs expected a reward for being reported for excellence, and the lack of reward could have been demotivating.
Recommendation	Various recommendations were provided, including continuation of LfE with dedicated person who supports the intervention, integration in mHealth application, reveal and follow-up on those reported for excellence, additions to the form and to focus on good performance in general, not just excellence.

CHW = Community Health Worker
DHO = District Health Office
LfE = Learning from Excellence
UK = United Kingdom

Site Supervisors also identified jealousy among CHWs as one of the barriers for participation in the intervention. They suggested that family issues in the villages led to jealousy as CHWs expected rewards and did not want another family to benefit from the rewards if they did not benefit themselves. The Site Supervisor for Site N also identified existing jealousy as a reason for lack of submitted LfE reports.

"Some of the CHWs were failing to vote for others based on their own reasons like family issues back in the villages where they stay […] if I can vote for such and such person then I will miss a reward in a way that their family will benefit more than mine." – Site Supervisor 3

9.4.3.3 Potential outcomes of LfE

Various outcomes of the LfE intervention were identified. The most commonly identified outcome was hard work by CHWs. The CHWs mentioned that LfE encouraged them to work hard as they wanted to be appreciated for their hard work and be in the spotlight and there are few opportunities to excel.

"[...] made people to be encouraged to vote for each other and also to work hard so that they should be on the spotlight." – CHW 3

Particularly CHWs who did not work hard in the past were thought to have started working harder since the implementation of LfE. When CHWs took part in the LfE intervention they wanted to be like those they were reporting for excellence, which made them work hard. As LfE made CHWs realise their work is worthy of praise, their self-esteem was expected to improve. Furthermore, CHWs felt motivated when they realised they were doing a great job, which made them work hard. Site Supervisors also acknowledged that CHWs considered it was motivating to tell someone they are doing great work. Site Supervisors additionally mentioned CHWs are eager to excel and be appreciated for their work, which made them work extra hard.

"[...] the programme has brought an element of boosting self-esteem and a spirit of hard-working on those who have been voted." – CHW 4

"This will make the CHWs to see how their fellow friends are working hard which is a sort of motivation for others to work hard too." – Site Supervisor 7

Some CHWs mentioned that the expectation of rewards for being reported for excellence, and the idea that the intervention entailed a competition made them work hard.

"For example, the one who has excelled should be revealed and given a little something as a sort of motivation and in that way people will be working hard." – CHW 6

CHWs themselves mentioned that the LfE form informed them about potential acts of excellence, as well as what PIH considered excellence. The CHWs could subsequently emulate these excellent events in their own work. For example, the form encouraged CHWs to convince patients to attend the hospital if they show symptoms and to encourage patients to continue taking medication, which is expected to improve patient's health. Stakeholders reported that CHWs learnt from identifying and reporting on excellence of their colleagues

"[form] was also giving us an idea that it's a very good thing that if there is someone who had stopped taking medication and we are going there for encouragements then we want good health for them." – CHW 10

Site Supervisors mentioned that CHWs showed more interest in what their colleagues do since LfE was implemented, and they themselves realised that it is important to point out the good work of CHWs.

However, while interview participants mentioned these potential outcomes, both Site Supervisors and stakeholders mentioned that there were no tangible outcomes yet as the time since implementation of the LfE intervention had been short, and no feedback about who had been reported for excellence had yet been provided.

Stakeholders did mention that they learnt a lot from the LfE intervention because it provided insight into what was happening on the ground and allowed them to assess performance of CHWs and highlight areas of excellence. They particularly gained insight regarding informal support networks, where CHWs ask their colleagues to help them out when a patient has defaulted.

"I think [LfE] gives us an opportunity and a platform for people to learn from each other's from each other's experiences." – Stakeholder 1

Stakeholders thought that LfE could act as non-financial incentive for CHWs as LfE provides a platform to acknowledge and appreciate them for their work. Potential outcomes could transcend the recognition platform as stakeholders hoped that over time, motivation, morale, as well as performance could improve due to the LfE intervention, as CHWs identified excellence and could emulate these acts of excellence in their own work.

9.4.3.4 Facilitators

Various facilitators for uptake and outcomes of LfE were mentioned. CHWs said that encouragement by Site Supervisors to participate in LfE, and reminders about the intervention by Site Supervisors, were the main reasons they decided to participate. Site Supervisor dedication and leadership were mentioned by stakeholders as important facilitators as well. Additionally support by and good liaison with the CHW team from the District Health Office (DHO), as well as the step-by-step explanation of the LfE

form facilitated uptake. According to stakeholders, differences in uptake at the different sites were due to variation in reminders and explanations provided by Site Supervisors.

"If the forms were just handed over to us without any encouragement [from Site Supervisor], it could not have shown any impact." – CHW 2

CHWs reported that the love of their work, and positive emotions felt when fellow CHWs are doing excellent work, led to participation in the LfE intervention. When CHWs filled in a form it reminded them of the great work themselves, and their colleagues were doing, which encouraged them to participate again in the future.

CHWs felt motivated by acts of excellence of others, which again led to participation in the intervention, as CHWs believed that not participating would be unfair to their colleagues who were excelling. They wanted their colleagues to be encouraged by reporting them for an act of excellence.

"[...] the hardworking spirit of fellow colleagues facilitated me to fill the report and vote for them." – CHW 11

The availability of forms and LfE boxes facilitated participation. Particularly the presence of a box in a remote area in Site G was identified as helpful as CHWs from that area live far from the health facility. The expectation of being rewarded for excellence was mentioned as facilitator for participation in the LfE intervention by CHWs.

"Most of [CHWs] had an idea that if I appreciate my fellow friend then the office (PIH) will give them something as a reward." – Site Supervisor 6

Time to reflect on their work and the work of their colleagues facilitated participation of CHWs. Reflection allowed CHWs to take a step back and look at their own performance, as well as the performance of fellow CHWs, which helped them identify and subsequently report excellence.

"[...] because for you to actually recognise or identify an area of excellence you must be in a space where you are reflecting on how you do your work how you can better the delivery of that work." – Stakeholder 1

One Site Supervisor mentioned that LfE coming from the UK encouraged CHWs to participate as they felt encouraged that people from abroad were interested in their work.

9.4.3.5 Barriers

The lack of understanding of the LfE intervention was a barrier that was often mentioned by CHWs, Site Supervisors and stakeholders. The lack of understanding led to CHWs not participating, which was particularly visible at Site N, where no reports had been submitted. Additionally, lack of understanding led to CHWs reporting on various acts of excellence on one form, which was not what we intended. CHWs mentioned that they should have been introduced to the ideas of LfE two months in advance so they could have prepared for participation. Others mentioned that the intervention was introduced quite quickly, which again hampered understanding.

"[...] the weaknesses were there since it came to us as a new thing and we couldn't understand it better, but after being briefed now and again we understood it better." – CHW 6

Additionally, stakeholders were uncertain if the acts of excellence reported by some CHWs really entailed excellence, which may have demotivated CHWs as they may have believed they reported something truly excellent.

"[...] think most the CHWs were able to submit the reports on excellence but actually when you are trying to follow up on those stories [...] you think this would be a good story but actually after going deep into the story you find that this is a normal duty for the CHW." – Stakeholder 2

Some CHWs were worried that LfE would be used to fire them if they were not reported for excellence, which was seen as measure of performance. Many CHWs mentioned it took them a while to understand the LfE intervention, but at the time the interviews were held, CHWs understood it well as they described LfE as an intervention that involves identification and reporting of acts of excellence of fellow CHWs. Not all Site Supervisors may have fully understood the intervention, as some believed a lack of reports would reflect badly of them. This led to Site Supervisors requiring CHWs to fill in a report, regardless of them identifying an act of excellence.

According to stakeholders, uptake of the intervention was not as good in the lower part of Neno District, compared to the higher part. They thought this was due to higher education levels and better access to care in the lower part. This meant, they suggested, CHWs did not have to excel in their work as often as CHWs in higher areas.

"The way I have noticed is like upper Neno has done a little bit better than lower Neno" – Stakeholder 3

There seems to have been some miscommunication, as one CHW mentioned that they did not participate in the LfE programme because they were told to only report acts of excellence from the previous month, while they wanted to report on something that had happened longer ago. Another CHW mentioned that excellence had to be reported as soon as forms were handed out, and they did not have enough time to think about it and reflect on performance of their fellow CHWs.

"The time I wanted to write the report in that month [site Supervisor] said we should not vote excellence event from the previous month, so this made me to fail to write a report because the CHW whom I wanted to report on had done the excellent event the previous month." – CHW 9

Other reported factors preventing participation included high workloads of CHWs and the heavy reliance on very busy Site Supervisors during implementation of the LfE intervention. Finally, the COVID-19 pandemic was mentioned as potential barrier as workflows of CHWs changed, making it potentially harder for them to excel in their work as there were fewer interactions with household members.

9.4.3.6 Rewards

The expectation of rewards was a theme that was regularly mentioned, as a reward was considered to be a thank you for excellent performance. CHWs expected to be rewarded for their acts of excellence, which in some instances led to CHW A reporting CHW B and the other way around. The lack of rewards was thought to demotivate CHWs to participate in the intervention, as they did not see the benefit of doing so. This was influenced by lack of feedback or failed interventions for CHWs in the past, which made them sceptical about new intervention. When CHWs have high expectations, and these are not met, they may feel demotivated. This was mentioned by the Site Supervisor at Site N as one of the reasons for non-participation in the LfE programme by CHWs at Site N.

"This may be because the expectations which the CHWs had that if someone excels then they will receive a reward wasn't there. When they realized this it made them to lose interest in the whole programme and starting to see the programme to be of no value." – Site Supervisor 7

Stakeholders were uncertain what kind of reward would work. They did not want to provide monetary rewards as they were worried this would lead to problems regarding jealousy, but also to less trustworthy excellence reports as people are keen to earn a

bit more money. Some stakeholders suggested in-kind rewards like a t-shirt, with which CHWs would be recognisable during home visits, whereas others mentioned that praise and recognition, non-financial rewards, could be sufficient. One stakeholder mentioned that rewards for acts of excellence should be given alongside rewards for overall good performers as to not alienate the latter.

"[…] when you want to appreciate someone for something good they have done, there is an expectation that you need to give them something tangible." – Stakeholder 1

"For his or her job say for example maybe we can give him or her maybe a t-shirt … that describes about his or her work as a CHW. Maybe. Not actually the monetary incentives as such." – Stakeholder 3

9.4.3.7 Recommendations

Due to miscommunication the LfE intervention stopped running in early 2021, but in the interviews CHWs mentioned that they wanted the intervention to continue. CHWs mentioned they would like to submit LfE reports with the help of the mHealth application, as this would ensure the reports were seen by the right people but would also allow CHWs to submit forms without anyone else noticing, which could prevent jealousy. One CHW mentioned that stakeholders should be the ones filling in reports as they know who has performed well and these results cannot be rejected, whereas reports from fellow CHWs were not always trusted. CHWs from two catchment areas mentioned that forms were not always available and recommended them to be available all the time in the future. One CHW, as well as the Site Supervisor of Site N, mentioned that voting should be restricted to CHWs from the village they work and live in, as they will not be able to identify excellence of those living in other villages.

"Though we were told that this will stop in December, but we felt that if this programme continues in future then it will be a good thing so that it can be an encouragement to those who are lazy in their work." – CHW 10

CHWs, stakeholders and Site Supervisors all mentioned that those who had been reported for excellence should be revealed as this could motivate others to be like those performing well. Additionally, it shows CHWs that the forms have reached relevant members of the CHW team.

"[…] a chance of showing each other what your colleague has reported about you should be there so that you may know what has been written about you." – CHW 1

Some recommendations regarded the forms used for reporting excellence, despite CHWs believing the form was well-designed. One CHW mentioned that the name of the CHW who fills in the report should not be reported. One CHW asked if other acts that PIH considers excellent could be included in the form and one CHW mentioned that voluntary counselling and testing for HIV should be added to the form, particularly for men as it is difficult for CHWs to convince them to get tested. Some CHWs thought that the form was too complicated, and multiple-choice options should be removed. One CHW mentioned that there should be space to write down a different type of excellent event, which there is, but this had not been seen by the CHW. Site Supervisors thought the form was not sufficiently clear and should be simplified. Stakeholders did not receive complaints regarding the forms.

"The questions which are on the form are the mandatory work which the CHWs are supposed to do, so they fail to identify on what is required for them since they see that all the work which they do every day are there and they fail to pick the excellence event they are supposed to report for." – Site Supervisor 2

One Site Supervisor was worried that the emphasis on excellence would demotivate CHWs, as not everyone excels. They recommended the LfE intervention to be more generalised, instead of only focusing on acts of excellence only. Another stakeholder recommended CHWs to be randomly selected for appreciation, not based on their performance. Site Supervisors further mentioned that often the same CHWs were reported for acts of excellence, and they wanted to restrict CHWs from voting for their friends. Another Site Supervisor believed learning from challenges was important alongside LfE.

"The way the programme was introduced showed that only those who could do better are the ones to be appreciated which demotivated others." – Site Supervisor 1

For better understanding Site Supervisors encouraged the implementers and stakeholders to brief them first, so they could discuss the intervention with the CHWs at their site.

Stakeholders mentioned the importance of following up on the reported stories to learn more about what happened during the event, but also to identify if the event was truly excellent, as some stories appeared to be exaggerated. One stakeholder mentioned that a dedicated person on the ground should be present, as they can help with encouraging

CHWs to participate, follow-up of forms and feeding back results. However, another stakeholder believed these roles can be done by the Site Supervisors. One stakeholder aimed to fully integrate LfE into the CHW programme, as well as into other PIH programmes, so it becomes a regular part of the narrative around CHW work.

"So, integrating [LfE] into the existing forums, so whether it's at CHW level at senior level, really making it part of our day-to-day narrative and part of the discussions that we have [...]" – Stakeholder 1

9.4.4 Synthesis

9.4.4.1 Context-Mechanism-Outcome configuration

I identified 41 CMOCs, including 12 contexts, 41 mechanisms and eight outcomes, of which seven were positive and one was negative. An overview of identified CMOCs is presented in table 30.

One CMOC regarded motivation, as was measured with the help of the quantitative study. Perceived supervision, or supervision in general, was not identified in the qualitative data.

9.4.4.1.1 Hard work

The most commonly identified outcome was hard work by CHWs. CHWs have duties at home, as household member and farmer, as well as CHW duties (C), in the context of these high workloads, the knowledge that someone appreciated a CHW for an act of excellence and reported them for it (M) led to increased motivation and hard work of CHWs (O).

Additionally, CHWs live and work in close-knit communities (C), and LfE primed and reminded CHWs about the extra care they can provide for their clients, who are their family and friends (M), who they love (M). CHWs initially believed their work was not worthy of praise, but LfE showed them their work in a different angle and made them realise that they are able to improve the lives of their community members, which led to increased interest in their work (M) which in turn encouraged them to work hard (O).

Table 30 Overview of all identified context-mechanism-outcome configurations. Several outcomes are mentioned multiple times, reflected by n/n at the end of the mechanism or outcome respectively.

	Context	Mechanism	Outcome
Individual	Close communities in which CHWs work and live	LfE reminded CHWs of the extra work and care they can do that would support clients, and primed CHWs about potential acts of excellence.	Hard work, improved self-esteem and improved CHW performance. 1/7
		CHWs love their clients, which encourages them to continue their work despite COVID-19 hardship.	
		LfE showed CHWs their work in a different angle, as they initially thought their work was not worthy of praise, but they realised their work is important, as they are able to save and improve lives of community members. As CHWs realise they are appreciated, interest in their work increases.	
		Through mHealth the results of LfE can be shared with supervisors directly, so CHWs don't know who reports about whom.	Reduced jealousy. 1/2
	CHWs have limited education	CHWs had difficulties understanding the LfE intervention, as the concept was confusing for them, indicators were written in a complicated way, and CHWs were not told about the intervention in advance, which would have helped them in understanding it fully and LfE was implemented very quickly.	Non-participation. 1/4
	CHWs have duties at home and in the field	The knowledge that someone reported and appreciated you for an act of excellence motivated CHWs.	Hard work, improved self-esteem and improved CHW performance. 2/7
		CHWs need time to reflect on performance of themselves and fellow CHWs to be able to report excellence. Reflection does not come naturally as they are very activity oriented.	CHWs motivated to participate. 1/6
		Continuous reminders for CHWs about the intervention made CHWs remember there was an option to report on acts of excellence. As many interventions are sent their way they may forget LfE exists.	
Interpersonal	Relationships among CHWs	Filling in a report of an act of excellence of a colleague made CHWs want to be like the colleague who performed well. Acknowledging and identifying excellence created opportunities for learning as it showed CHWs how to excel in their work	Hard work, improved self-esteem and improved CHW performance. 3/7
		CHWs felt that participating in the intervention would be encouraging for those being reported for excellence, it helped them notice excellent performance and hard work of others, and it made them feel good to fill in the report.	
		Excelling CHWs should be randomly selected, as this doesn't favour anyone.	Reduced jealousy. 2/2
		Not CHWs but the CHW Team or Site Supervisors should report excellence as they have the dashboard with performance data.	
		CHWs felt that it would not be fair on excelling colleagues to not fill in a report about their act of excellence.	CHWs motivated to participate. 2/6

	Context	Mechanism	Outcome
		There is quite a bit of jealousy among CHWs, and they weren't flexible enough to put that aside as many expected a reward, and they don't want others to benefit from the LfE intervention if they themselves don't.	Non-participation. 2/4
		The same CHWs were reported for excellence (i.e., clique) and only those who are reported for excellence will benefit from the intervention, not everyone else in the catchment area which demotivated CHWs.	
		Regular interaction of the Site Supervisor with CHWs and village leaders.	Strengthened relationships.
Institutional	Large CHW programme with many aspects and employees	There is limited interaction between CHWs and other health professionals and the knowledge that the LfE reports filed by CHWs reach supervisors and CHW team and shows them how good CHWs are, which improved coordination among CHWs and their supervisors.	Hard work, improved self-esteem and improved CHW performance. 4/7
		Due to the way in which CHWs operate it is difficult to know what fellow CHWs are doing, let alone what non-CHWs are doing.	Non-participation. 3/4
		Implementation relied heavily on Site Supervisors despite them being busy already.	
		The stories identified with LfE can provide the CHW team with more information about what happens on the ground and the stories can be developed into impact stories and better knowledge of the CHW programme.	Improved CHW programme.
		Site Supervisors realised that excellence of CHWs should always be reported as it provided insight into their work and could be learnt from.	
	Limited opportunities to provide feedback.	CHWs drive to excel and were eager to be reported for acts of excellence and want to be the next CHW in the spotlight.	Hard work, improved self-esteem and improved CHW programme outcomes. 5/7
		CHWs are unaware if they have been reported for excellence or not, but still like the possibility to be reported.	
		LfE was introduced at the right time for CHWs and was received wholeheartedly.	CHWs motivated to participate. 3/6
		LfE encouraged CHWs for the work they do, and they were eager for the LfE intervention to continue in the future	
		CHWs were worried they would not be reported for an act of excellence and realised that other CHWs would have this worry too.	
		In the past Site Supervisors have reported excellence to CHW team, but this wasn't followed up, the LfE intervention made CHWs hopeful that follow-up would happen.	
		By integrating LfE into every aspect of CHW work a culture of appreciation can be created.	Culture of appreciation.
		Site Supervisors reminded CHWs that LfE is for their benefit, which encouraged them to participate, which then encouraged them.	Hard work, improved self-esteem and improved CHW performance. 6/7

	Context	Mechanism	Outcome
	Expectation of reward	An element of competition, including rewards for those that have been reported for excellence would improve uptake.	CHWs motivated to participate. 4/6
		CHWs hoped that in the future they would be rewarded for being reported for an act of excellence.	
		The lack of rewards made CHWs believe the intervention wasn't beneficial for them and meant their expectations weren't met. Lack of benefits or rewards or phase out of other interventions in which CHWs participated led to a bad mentality among CHWs to new interventions.	Non-participation. 4/4
	PIH is an international organisation	LfE was first implemented in the UK, this made CHWs realise that their work would be known about abroad, which encouraged them	CHWs motivated to participate. 4/6
Infrastructure	Limited resources	CHWs are only volunteers and being thanked for their work by someone who values their work will make the feel good While it is impossible to incentivise CHWs financially, LfE may be a non-financial motivation for CHWs.	Improved motivation and morale.
		LfE is an opportunity for CHWs to be appreciated despite limited available resources and recognise them for the great work they do.	Hard work, improved self-esteem and improved CHW performance. 7/7
	Hierarchy in Malawian society	Those who have been reported for excellence should be revealed as this will show that report has been received by the relevant people additionally, public announcement of excellence would be an opportunity to thank CHWs for their work and motivate them.	
		Site Supervisors acted as champions and encouraged CHWs to fill in the forms and report excellence of their fellow CHWs.	CHWs motivated to participate. 5/6
		LfE was aimed at only CHWs, which made them feel free to participate as they would benefit from the intervention.	
		LfE provided CHWs with an opportunity to praise their colleagues themselves, without having to wait for praise by supervisors which encouraged them.	
	COVID-19 pandemic	CHW workflows changed, so there were fewer interactions at the household level, leading to fewer opportunities to perform an act of excellence.	
	Mountainous district with large distances between villages and health facilities	Availability of forms.	CHWs motivated to participate. 6/6

CHWs = Community Health Workers
LfE = Learning from Excellence
mHealth = Mobile Health
UK = United Kingdom

Interpersonal relationships among CHWs (C) encouraged CHWs to participate in the intervention as they wanted their friends to be encouraged, so they reported them if they identified excellent performance (M). CHWs strive to be like the CHWs they are reporting for excellence (M), which encourages them to work hard (O)

The CHW programme is very large, with many aspects and employees (C) and there is limited interaction between CHWs and other health professionals, so the knowledge that the LfE reports reach the CHW team at the DHO and shows them how good the CHWs are in their work, encouraged CHWs (M) and made them work hard, and improved their self-esteem and performance (O).

In the CHW programme there are limited opportunities to provide feedback (C), so CHWs were enthusiastic about the opportunities provided by the introduction of LfE and wanted to excel and be in the spotlight for acts of excellence (M). Despite the lack of feedback provided to CHWs about who had been reported for excellence, they still wanted to be reported for good work (M), which encouraged them work hard (O).

In the context of limited resources being available in Neno District (C), LfE provided an opportunity to thank CHWs for outstanding performance and recognised them for the great work they do (M), which encouraged CHWs and led to hard work (O).

As identified in Chapter 5, there is a strong hierarchy in Malawian society and the CHW programme (C) and CHWs liked being able to praise their fellow CHWs in the LfE intervention, without having to wait for praise from higher up (M). When CHWs who have been reported for excellence are revealed, and thanked in public, this will show that the reports have been seen by the relevant people, higher up in the hierarchy, and CHWs will feel motivated for being recognised (M), which is thought to lead to hard work (O).

9.4.1.1.2 Reduced jealousy

CHWs live and work in close communities (C), and the paper based LfE intervention means fellow CHWs can see if you participate in the intervention or not, which could lead to jealousy. The mHealth programme would allow for reports to be filled in anywhere, and for the results to get to Site Supervisors immediately (M), which would reduce jealousy among CHWs. Relationships among CHWs are not always good (C), and by randomly selecting CHWs to be put in the spotlight (M), or by having Site

Supervisors or the CHW team report on excellence, instead of CHWs themselves, the results would be better trusted (M), which could reduce jealousy among CHWs (O).

9.4.4.1.3 Participation

CHWs have high workloads with duties both at home and as CHW (C). By providing CHWs with time to reflect upon their work and the work of their fellow colleagues, CHWs can identify excellence (M), additionally, continuous reminders about the existence of the LfE intervention, and the option to report on excellence of colleagues (M) led to participation in the intervention (O).

While relationships among CHWs are not always good (C), CHWs felt that it was unfair to those who excelled to not fill in a report (M), which made them participate in the intervention (O).

In the CHW programme there are limited opportunities to provide feedback (C), as the LfE intervention provides an opportunity to give feedback, CHWs believed it was introduced at the right time and they received it wholeheartedly (M). LfE encouraged the work of CHWs, and they were eager to participate (M), particularly as CHWs worried that they would not be reported for excellence, and realised that colleagues shared this worry (M). In the past supervisors reported on excellence of CHWs, but this was not followed up, and CHWs hoped that with LfE excellent performance of CHWs would be acknowledged by the district health office (M). All of the above led to participation in the LfE intervention (O).

CHWs expected a reward for being reported for excellence (C), and they believed LfE was a competition, with prizes for the winners (M). They were keen to win so they would be rewarded, which led to participation (O).

PIH is an international organisation, with many visitors from abroad (C), the LfE intervention also came from abroad, and this allowed CHWs to see that their work would be known about outside of Neno District, and even Malawi (M), which encouraged them to participate, to share acts of excellence (O).

As Neno District is a very mountainous district with sometimes large distances between villages (C), the availability of forms near CHWs (M) meant it was easier for them to participate in the intervention (O).

As identified in Chapter 5, there is a strong hierarchy in Malawi (C), and encouragements of those ranked higher than CHWs, like Site Supervisors and the CHWs team (M) led to participation (O). However, on the other hand, the fact that LfE was aimed at CHWs themselves made them feel free (M) and encouraged participation. Perceived support from management, through for example encouragement, was also measured in the quantitative part of this study, but as support was high at baseline, no statistically significant change was observed in two of the fourteen catchment areas where the quantitative data collection took place.

9.4.4.1.4 Non-participation

CHWs have limited training and education (C), the concept of LfE and providing feedback was unfamiliar for them, and some did not understand the components on the LfE forms, as they were not sufficiently clear (M) which led to CHWs not participating in the intervention.

As mentioned previously, relationships among CHWs are not always good (C), there was quite a bit of jealousy and CHWs did not want others to benefit from the LfE intervention if they themselves did not (M). CHWs also noticed that the same CHWs were reported for excellence, and, as only those reported would benefit, CHWs felt demotivated (M), which led to non-participation (O).

CHWs expected to be rewarded for participating in the LfE intervention (C) and the lack of rewards during the time the intervention ran made CHWs believe the intervention was not beneficial for them and did not meet their expectations (M). Unfortunately, past interventions had phased out before CHWs benefited from them, which demotivated them (M) which led to non-participation in the LfE intervention (O).

The CHW programme is a very large programme, with many aspects and employees (C), and CHWs often work alone, making it difficult to observe how others are performing (M), which led to non-participation (O). The implementation of the LfE intervention relied heavily on Site Supervisors, who were very busy with assigned tasks, leaving them unable to invest time into explaining the intervention to CHWs (M), as CHWs did not fully understand the intervention they did not participate (O).

The COVID-19 pandemic (C) led to changed workflows for CHWs, and fewer interactions at the household level, and thus fewer opportunities for excellence (M), which led to non-participation (O).

9.4.4.1.5 Outcomes

This section regards CMOCs that explain how certain outcomes of the LfE intervention for CHWs in Neno District have been achieved. In this section the quantitative data will be triangulated with qualitative.

Before the implementation of LfE there were limited opportunities for feedback (C), and by fully integrating LfE into of the CHW programme, as well as into other programmes delivered by PIH in Neno District, positive feedback could become a standard part of the narrative (M), supporting the creation of a culture of appreciation (O).

The CHW programme is very large, with many aspects and employees (C). The stories identified through the LfE intervention provide the CHW team with more information and insight into what is happening on the ground as well as how to do more acts of excellence (M), leading to an improved CHW programme (O).

As identified in Chapter 5, there are limited resources in Neno District (C), and in this context, the LfE intervention could motivate CHWs (O) as while they are merely volunteers, with the help of the LfE intervention, they can be recognised for the work they do on a daily basis, which could improve motivation (M). In the quantitative aspect of this mixed-method evaluation, motivation of CHWs was measured before and after the implementation of LfE, but there was no statistically significant improvement after implementation of LfE. The quantitative results showed that motivation of CHWs was high at baseline level and did not improve significantly after implementation of LfE.

The quality of interpersonal relationships in the villages varies (C). LfE led to strengthened relationships among CHWs themselves, as well as among CHWs and village leaders (O) due to improved interaction of Site Supervisors with CHWs and village leaders (M) and as CHWs noticed excellence of their colleagues more (M). In the quantitative aspect of this study, I also looked at perceived supervision, as we initially hypothesised the LfE intervention, as integrated into the mHealth application, could potentially impact relationships between CHWs and SCHWs, as also identified in the CMOc above. However, improved relationships among CHWs and SCHWs specifically was not mentioned in the qualitative study, nor did I identify a statistically significant difference between perceived supervision before and after implementation of LfE.

9.4.5 Logic Model

I expanded the logic model as designed in the observational study, described in Chapter 5. Figure 34 provides an overview of the logic model components identified in this study, while figure 35 provides an overview of the full logic model, including elements identified in the systematic review, presented in Chapter 4, and elements identified in the observational study of Chapter 5.

In this mixed method evaluation, I identified many factors that were already present in the model. It should be noted that some mechanisms identified in the CMOCs regard mechanisms to uptake of the LfE intervention, and they are presented as contextual factors in the logic model, explaining what should happen for the intervention to be used. Factors explaining how the intervention leads to outcomes once it has been used are presented as mechanisms.

CHWs mentioned that the LfE intervention came at the right time, and stakeholders mentioned that in the absence of financial or in-kind incentives to thank CHWs for their work, LfE was a good intervention, fitting with 'perceived need for the LfE intervention'. Some Site Supervisors mentioned that the lack of past successes impacted the buy-in from CHWs into the intervention as they were demotivated by lack of feedback about these past interventions. This shows that past successes are important for effective implementation.

It took CHWs a while to fully understand LfE, and that additional briefings about this by Site Supervisors and the CHW team helped them to understand it. While CHWs seemed to understand the intervention well by the time the interviews were performed, the definition of excellence should potentially be further explained.

While one CHW mentioned that it was clear that no rewards were attached to being reported for excellence, many CHWs and even Site Supervisors, did expect these rewards. As expectations were not met, CHWs were demotivated and unwilling to participate. This highlights the importance of clear communication about the LfE intervention, which may not have been sufficient.

Many CHWs did buy into the LfE intervention and were encouraged to participate by their Site Supervisors, who acted as champions. I did not identify champions among CHWs themselves, as they did not mention this.

A safe environment in which LfE is implemented is important and may not have been present during the implementation of LfE. For example, the high levels of hierarchy may have prevented CHWs from participating in the intervention. Additionally, many CHWs reported existing jealousy among CHWs, which may have led to an unsafe environment.

As with many health professionals, CHWs have high workloads. This was expected to prevent participation in the intervention. A Site Supervisor furthermore mentioned that the presence of an external organisation, the University of Warwick, operating in another country, encouraged CHWs as this showed the CHWs people from abroad were interested in their work.

During implementation of the intervention, it is important that the timeline for which an intervention runs is clear to everyone involved, which was not always the case for LfE in Neno District. Additionally, sufficient access to the intervention is important for participation. At some sites this was better organised than at others, as I identified in the interviews. To participate in LfE, CHWs need to have sufficient time to reflect upon their work and the work of their colleagues to be able to fill in a report. I determined 'time to reflect' to be an important mechanism for participation in LfE, but not a mechanism explaining how the LfE can impact performance of CHWs, which is why 'time to reflect' is added to the logic model as contextual factor during implementation of the intervention. Finally, the feedback loop needs to be closed for the LfE intervention to lead to impact.

While no aspects regarding the feeling of community were identified in the observational study, several additions were identified in this study. For example, CHWs liked that their stories of excellence reached their supervisors and the CHW team who would subsequently learn about their work which could lead to a feeling of community. This additionally leads to cross-pollination of positive work as CHWs are aware of excellent work by others. CHWs also liked that the LfE intervention was aimed at them and allowed them to praise fellow CHWs without having to wait for supervisors to praise them. This is thought to improve the feeling of community among the CHWs. CHWs commented on how participation made them feel good, and how they liked encouraging colleagues who were performing very well. Perceived support of management,

already present in the initial logic model, in the form of encouragements by Site Supervisors to identify and report excellence, and to work hard, was reciprocated by CHWs by participation in the LfE intervention. Perceived supervision was assessed in the quantitative part of this study, but I did not identify a statistically significant change in perceived support.

Another addition to the logic model, which is expected to feed into affirmative bias, was the opportunity to recognise colleagues for the work they do. Before the LfE intervention was introduced there were limited opportunities to do so. CHWs mentioned the LfE forms primed them about potential acts of excellence. Furthermore, participating in the LfE intervention encourages them to notice excellence of fellow CHWs. As previously identified, acknowledging strengths, and noticing positive practice were identified as important mechanisms.

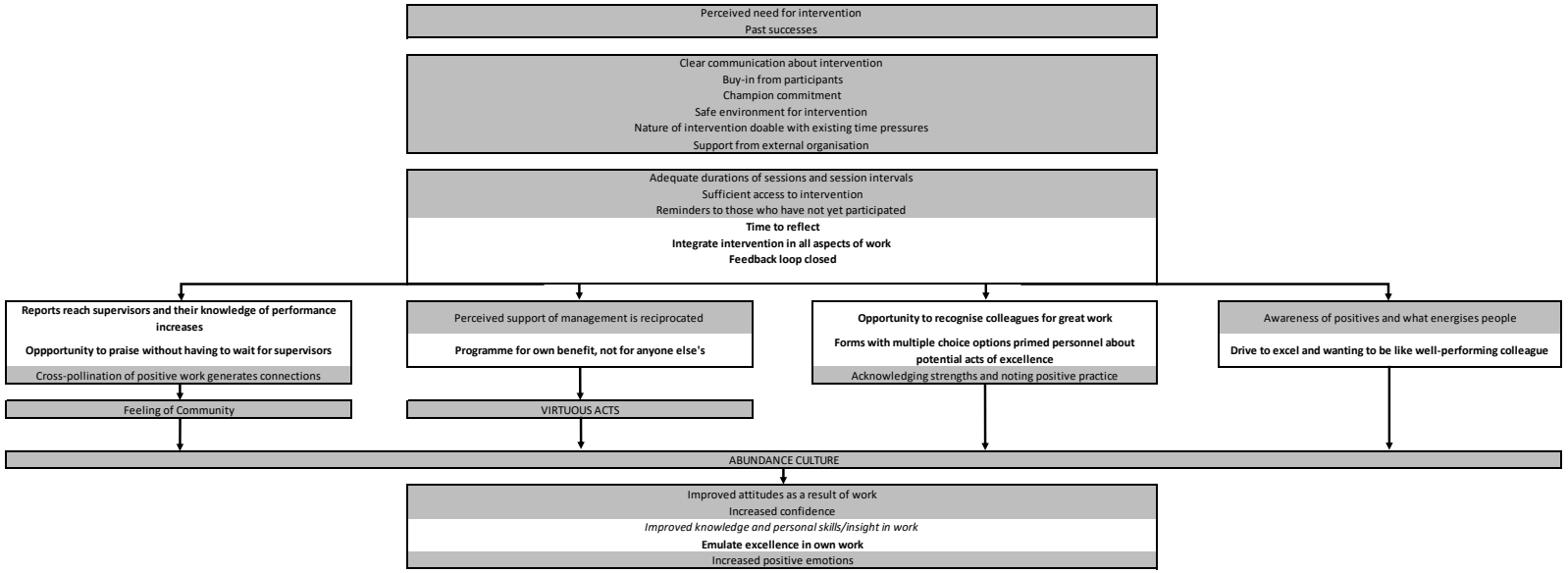
CHWs mentioned that they liked that the LfE intervention was aimed at them, and introduced for their benefit, not anyone else's. This encouraged them to participate in virtuous acts, which was added to the logic model.

The LfE intervention is additionally expected to create an awareness of positives and highlight what energises people as identified in both the systematic review and the observational study. CHWs also mentioned that they drive to excel and want to be like the colleagues they are reporting for excellence, which leads to a focus on what is going well in the CHW programme.

One stakeholder mentioned the importance of integrating the intervention into all aspects of work to create an appreciative culture, which can be part of an abundance culture.

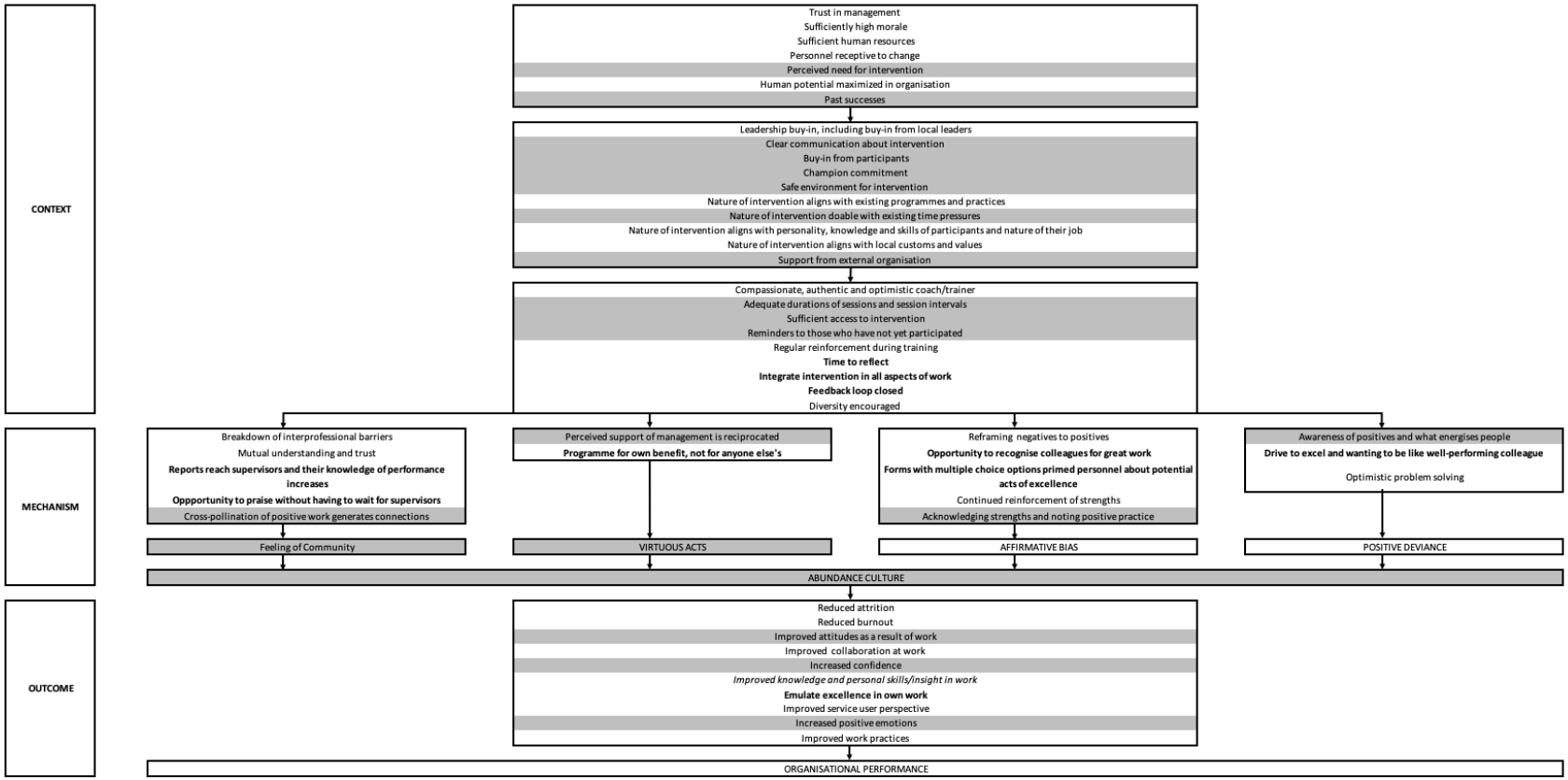
In terms of outcomes, I identified one intermediate outcome that was previously identified, which regarded emulation of excellence in own work when identifying and reporting others for excellence, which is expected to lead to improved performance. Furthermore, I again identified 'improved attitudes to work', including motivation, work commitment and morale, as in the systematic review (Chapter 4).

Figure 34 Logic model of factors identified in the mixed method study.



Bold	=	New components.
CAPITAL	=	Components from Lewis' theory.
Grey	=	Components have been identified previously.
Italic	=	Components that have been identified previously, including new addition.

Figure 35 Full adapted logic model after mixed method study.



Bold	=	New components.
CAPITAL	=	Components from Lewis' theory.
Grey	=	Components have been identified previously.
Italic	=	Components that have been identified previously, including new addition.

I measured motivation in the quantitative aspect of this study but did not identify a statistically significant improvement. CHWs experienced 'increased positive emotions', 'increased self-esteem' and 'improved knowledge and skills', as well as 'insight into their work', as before LfE they did not believe their work is worthy of praise. All these intermediate factors are hypothesised to impact performance of CHWs.

9.5 Discussion

While my qualitative findings indicated that motivation could be improved with the introduction of LfE, because LfE provided an opportunity to recognise CHWs in the absence of financial incentives, the quantitative data did not show any statistically significant improvement in motivation after the co-designed LfE intervention was implemented. I did not identify an impact of LfE on perceived supervision in either the quantitative or the qualitative data. This could potentially be due to miscommunication as those on the ground believed the intervention was for CHWs only, so those higher up in hierarchy did not participate. It should be noted that while we intended the intervention to be for everyone, as it could lead to an improved feeling of community, CHWs mentioned that they liked that the intervention was aimed at only themselves.

I also did not identify data to support the idea that LfE could potentially improve relationships between CHWs and their supervisors and supportive mentorship, as identified as potential outcome in Chapter 6 although one identified CMOC regarded relationships between stakeholders among different levels as LfE was thought to increase interaction among them, leading to strengthened relationships. I additionally identified the impact of LfE on relationships among CHWs themselves, as CHWs became more observant of the work done by their fellow CHWs and they wanted those that excelled to be encouraged. On the other hand, the LfE intervention also increased jealousy among CHWs, who expected rewards for being reported for excellence, and did not want others to benefit over themselves.

Jealousy, one of the identified risks in the mixed method evaluation, was also identified in the exploratory study, performed in the United Kingdom (15). In my study Interview participants suggested that jealousy played a role in non-participation, however, the CHWs who did not participate in the LfE programme did not mention jealousy as a reason for their non-participation. One CHW mentioned that jealousy had increased since the implementation of LfE. However, most interviewed CHWs welcomed the LfE programme as it made them feel appreciated suggesting there is likely

to be some value in an LfE programme, even though the quantitative findings of this study did not identify any evidence of the effect of LfE on motivation or perceived supervised. Looking forward, it would be important to identify how to manage and minimise feelings of jealousy. For example, by ensuring CHWs have no false expectations of financial or in-kind rewards based on LfE reports.

I developed a logic model, explaining contextual factors that were important before implementation of LfE in Neno District, contextual factors that were important during design and implementation of the LfE intervention and factors that were important when the intervention is running. Important before design and implementation is the perceived need for intervention, which I identified in this mixed method study, as well as the previously performed systematic review, as presented in Chapter 4 (181). Past successes seem to impact uptake of the LfE intervention, as was identified in this study as well as a previous exploratory study performed in the UK (3). While I did not identify anything related to the 'feeling of community' in the observational study, this, as well as various factors that could improve the feeling of community, were mentioned in this mixed method evaluation. Factors included the cross-pollination of work, as CHWs pause, take time to reflect, and identify excellence of their colleagues. The feeling of connectedness, through professional support structures and decreased distance between CHWs and their supervisors, were also identified as important for CHW performance, as identified in a comparative analysis of factors shaping CHW relationships in four countries, including Malawi (70). LfE could potentially encourage professional support and decrease distance from supervisors, when they participate in the intervention, and thus increase feelings of community, leading to improved performance (70). The same study identified regular and visible supervision as mechanisms leading to CHWs feeling supported, which affected relationships with CHWs and the health sector as well as relationships with CHWs and the community. LfE could increase visibility of supervision, particularly if the outcomes are reported in public, which could lead to CHWs feeling supported and increased performance (70).

During design and implementation particularly communication about the intervention stood out, as many CHWs had difficulties understanding the intervention when it was first introduced, which had been identified previously in the systematic review (Chapter 4) (181). 'Champion commitment', as identified in the exploratory study (3), the systematic review (Chapter 4) as well as in this study was considered very important

for uptake of the intervention (181). During the intervention itself it is important CHWs have sufficient 'time to reflect' upon their work and the work of their colleagues. This mechanism was identified in the systematic review as well, as described in Chapter 4 (181). Due to oversight 'time to reflect' was not added to the logic model, but as explained in this chapter, having 'time to reflect' encourages CHWs to participate in the LfE intervention, which is why this was added to the contextual factors, as mechanism to uptake. The feedback loop, specific for LfE, should be closed and the CHWs should be informed about who has been reported for excellence and what they did. As explained in Chapter 6 and Chapter 7, the feedback loop was not yet designed. During the evaluation of the co-designed LfE intervention, as described in this chapter, I, together with stakeholders from PIH, developed some ideas about what the feedback loop could look like (public praise for CHWs), and what should be avoided (i.e., financial rewards). The feedback loop is an important aspect of the LfE intervention and should be implemented as soon as possible.

Virtuous acts were considered important, like in the systematic review and exploratory study (3, 181). CHWs wanted their colleagues to feel encouraged, and in return, filling in a report about their excellence made CHWs feel good themselves. However, as many CHWs expected rewards, participation in the LfE programme was not necessarily a virtuous act, which are performed without expecting something in return (109).

LfE provided an opportunity to recognise colleagues for excellence, and thus to create affirmative bias. LfE encouraged CHWs to acknowledge strengths and highlighted positive practice, as previously identified. Finally, through LfE an awareness of positives as well as about what energises CHWs was created, which was previously identified as important for impact. A new factor, feeding into positive deviance, was the drive to excel and wanting to be like the colleague you are reporting for excellence.

While the abundance culture is an important factor of the theory I developed, I had not previously identified it as part of the logic model. However, the creation of an abundance culture through LfE was one of the qualitative findings of this mixed method evaluation.

LfE is thought to lead to improved attitudes to work, as well as improved confidence, which were both previously identified as intermediate outcomes. Motivation impacts performance of CHWs, as explained in Chapter 1. One new outcome was identified,

namely emulating excellence in own work by those who reported a colleague for excellence, which is considered to lead to improved performance as more CHWs perform an act of excellence. Finally, the LfE intervention led to improved knowledge about work, as well as new insight regarding work practices. This was previously identified in the exploratory study (3), but at the time we did not know how this could fit into the logic model. Improved knowledge itself was not directly identified as impacting performance of CHWs, although Merriel identified it as a factor that influenced patient outcomes, which are an aspect of performance (130). Additionally, training, which is expected to increase knowledge, was identified as a factor impacting performance. Positive emotions can lead to increased resilience, through broadened thought-action-repertoires as explained by Fredrickson et al. (125) and thus impact performance of CHWs.

The developed logic model can be used by those designing and implementing interventions like LfE for health workers. While the logic model presented in figure 35 is based on my findings for CHWs in Neno District, based on the similarities of findings with the systematic review (181), as well as the exploratory study performed in the UK (3), the logic model could be useful for health professionals in various different settings and increase strength of implementation of interventions like LfE (271).

This study has several limitations. Due to the impact of the COVID-19 pandemic I was unable to travel to Malawi for data collection. I trained the RA in semi-structured interviewing, and while outcomes of CHW interviews were good, the Site Supervisor interviews included a lot of data that was not related to the LfE project itself, due to miscommunication. However, the interviews included the information about LfE that was relevant to the study. At the time of the interviews were held the RA was no longer volunteering with PIH, however, they had been working with the Site Supervisors previously. Additionally, the RA had been involved in the implementation of the programme, and Site Supervisors may have felt pressured to say good things about LfE or leave out negative opinions. However, while many Site Supervisors were positive, some Site Supervisors were critical of LfE and provided recommendations for improvement, showing that they felt sufficiently comfortable with the RA to share their more negative views. Additionally, due to miscommunication the post-LfE questionnaires did not included names. Fortunately, the Site Supervisor at Site G remembered

this aspect and the CHWs wrote their names on the forms, which allowed me to perform a paired data analysis. Unfortunately, this was not the case for Site F. I considered asking CHWs to fill in the questionnaires again but based on the data from Site G and the lack of difference between pre- and post-LfE I believed that asking them again would to be too burdensome. While paired analysis was underpowered as a result of not having the names of CHWs on forms collected at Site F after implementation of LfE, the absolute change in medians was small. It is thus unlikely that low sample sizes were the reasons for no statistically significant change in motivation or perceived supervision after implementation of LfE.

Unfortunately, I was uncertain if CHWs either understood the negatively phrased questions in the questionnaire, or felt uncomfortable answering them honestly, as correlation between these questions and the construct of motivation was low. While Cronbach's alpha was not very high, it was considered to be sufficient for a questionnaire with ten questions.

The 'perceived supervision' outcome as measured in the questionnaire was not as relevant as initially expected, possibly as we did not end up using the mHealth application for implementation of LfE. Retrospectively, it would have been better to look at other intermediate outcomes, like positive emotion or confidence in work, instead of perceived supervision.

Another limitation is that unlike in Chapter 5, CB did not check the groupings of codes into sub-themes and the grouping of sub-themes into themes due to time pressures. It should be noted that CB and I agreed well in Chapter 5, and no sub-themes were identified that did not fit into an obvious theme, so, while not ideal, we considered CB checking the memos summarising the themes sufficient.

The strength of this study includes the large number of CHWs and Site Supervisors participating in the interviews. While I did not aim for data saturation *per se*, this seems to have been reached. While I aimed to identify differences between the sites, these did not appear to be as large as initially anticipated based on the difference in reports provided per site, which could indicate that the engagement of Site Supervisors may be the most important factor for uptake.

Future studies should aim at testing the components of the logic model, preferably with the help of quantitative data. In particular because improved motivation is considered to be an outcome of LfE, but this was not identified in the questionnaire outcomes, it should be tested again, possibly with a cohort where motivation is relatively low. CHWs participating in this study already reported high motivation before implementation of LfE. The logic model is quite large and contains a lot of information, but not all the included components may actually play a role in the impact of LfE. Testing the different components in future studies may provide more insight into their role in LfE outcomes.

9.6 Conclusion

While stakeholders, CHWs and Site Supervisors welcomed the LfE intervention for CHWs in Neno, District, because it allowed them to appreciate CHWs for their excellent work in the absence of opportunities to do so, I did not identify statistically significant differences in CHW motivation and perceived supervision pre- and post-implementation of LfE. I identified various barriers and facilitators as well as mechanisms explaining uptake and outcomes of the LfE intervention and adapted the logic model developed in Chapter 5 according to the findings. More quantitative data is needed to identify if LfE can make a statistically significant difference in the qualitatively identified outcomes.

CHAPTER 10: DISCUSSION & CONCLUSION

In this chapter I will provide a brief overview of the findings of the different studies I conducted as part of this thesis. Each chapter contained its own discussion section, and in this overall discussion I will highlight my more pertinent findings and compare these with existing literature and with that on Community Health Worker (CHW) motivation in particular. I will present strengths and weaknesses of this research before I provide recommendations regarding Learning from Excellence (LfE) and future research. I will finish the chapter with a conclusion.

10.1 Short summary of findings

In Chapter 4 I presented the findings of the systematic review that we conducted (181). In this systematic review we developed a logic model that explains how interventions based on Positive Psychology (PP) can potentially impact health workers. The most commonly mentioned mechanism explaining how PP interventions could lead to improved performance of health workers regarded 'recognising and reframing of negative interpretations'. This mechanism seems particularly important in the context of healthcare, where there is an emphasis on prevention of adverse events (116). Another identified mechanism included 'sharing experiences and history', as a PP intervention could bring people from different wards, departments, and job roles together, which could help in breaking down barriers among people from different roles, different levels of hierarchy and different wards and departments. Additionally, 'time to reflect' was identified. Healthcare professionals are busy, and there is often little time to reflect on their practice. Apart from mechanisms, we identified various contextual factors, which included the 'work environment', which is often very busy, and may prevent participation in an intervention, as well as a 'history of failed projects' which may impact willingness of health workers to participate in new interventions, due to bad experiences in the past. Another important contextual factor regarded 'support from management', which encouraged healthcare professionals to participate in the PP intervention. Identified intermediate outcomes included 'positive mental health' as well as 'interaction and support', which were thought to support improved organisational performance in healthcare (181).

In Chapter 5, the observational study, the logic model that was developed in the systematic review was adapted to present the local situation of Neno District. Several factors that were identified in the systematic review were important for CHWs in Neno District, including 'leadership buy-in', 'alignment of intervention with health workers', 'reframing negatives to positives', 'increased awareness of positives', 'acknowledging strengths and positive practice, and 'awareness of what energises people'. Similar intermediate outcomes included 'improved attitudes as a result of work' and 'improved work practices'. Two new contextual factors were identified, including 'alignment of intervention with existing programmes and practices' and 'alignment of intervention with local customs and values'.

In Chapter 6, the co-design of the LfE intervention for CHWs was explained. I chose co-design to help align LfE with local customs and values. Co-design is expected to support the design of an accessible and feasible intervention for the end-users, the CHWs. While I initially aimed to conduct workshops for CHWs, senior CHWs (SCHWs), and other stakeholders, it was decided to first conduct various co-design activities with the stakeholders' group, before gathering CHW feedback during a pilot. We chose this due to various reasons: I visited Neno District during the rainy season, which made travelling for CHWs as well as stakeholders difficult, and we feared CHWs would not feel comfortable to speak up during workshops due to strong hierarchy in Malawian society. Participation of stakeholders in the co-design process was expected to improve leadership buy-in, an important contextual factor identified in the observational study. Furthermore, as stakeholders have thorough knowledge of the various programmes implemented by both the Ministry of Health (MOH) and Partners in Health (PIH) in Neno District, the LfE intervention could be designed to align with these programmes, another factor identified as important in the observational study.

I started the co-design process with examples of LfE forms that were used in the United Kingdom (UK). One of the outcomes of the co-design process was that forms should contain multiple-choice options, instead of open-ended questions, as this was likely to encourage CHWs to participate. We included an option for a different type of excellent event as well. We discussed implementation and it was decided that the pay-day, during which all CHWs from one catchment area come together, would be a good moment to introduce LfE. During implementation the forms would be read aloud

for CHWs, to ensure comprehension, and there would be an opportunity for CHWs to ask questions.

The pilot, as described in Chapter 7, showed that many CHWs understood the LfE form well and that they were eager to participate (as many CHWs did). Many CHWs reported each other (i.e., CHW A reports B and the other way around) though, and stakeholders were uncertain if communication about the LfE intervention was sufficiently clear, as they were unsure if CHWs reported on excellence or on everyday performance. To improve communication regarding excellence versus everyday performance, we decided to discuss excellence during implementation of LfE with the help of two scenarios: one regarding everyday performance and one regarding excellence.

In Chapter 8 I presented the outcomes of the co-designed LfE forms that were submitted between September 2020 and November 2020. In total, 555 LfE forms were submitted at 13 of the 14 catchment areas in Neno District, by 390 CHWs and SCHWs. Many CHWs checked multiple excellent events on their single form, with 22.2% (n=123) of forms including more than one excellent event. This was not what was initially intended and may indicate that communication regarding the LfE intervention was insufficient. Events that were commonly reported included 'counselling on treatment adherence', which was reported on 15.1% (n=84) of the forms, and 'timely referral', which was reported on 11.2% (n=62) of the forms. The explanations provided for 'advocated for client' did not represent what we had in mind when we designed the form, as many CHWs seemed to have understood this type of event as encouraging a defaulting patient to go back into care rather than, as we intended, to advocate on behalf of patients, to ensure they are being seen and treated in the health facility when the patient's family is unable to do so. Some CHWs were reported more than once (n=101), with six CHW being reported for excellence five times. In total 162 reports regarded (S)CHWs reporting each other (i.e., A reports B and the other way around), which may be because (S)CHWs expected rewards and wanted everyone to benefit. However, it could also be they reported each other as they live near each other, meaning they are in a good position to observe each other's work and notice excellence.

Chapter 9 presented the mixed method evaluation. I did not identify any statistically significant differences regarding motivation and perceived supervision between pre- and post-implementation of LfE, which could be due to high levels of motivation and perceived supervision before implementation of LfE. Many CHWs welcomed the LfE intervention as it allowed them to appreciate their fellow CHWs for the work they do, and it made them feel recognised. LfE provided CHWs with insight into what PIH considers excellent performance and highlighted excellent performance of fellow CHWs as well, which they could subsequently emulate in their own work. Results showed that it took CHWs a while to wrap their head around the LfE intervention. CHWs, as well as Site Supervisors, mentioned they would have liked more time to gain a better understanding of the LfE intervention. Jealousy among CHWs, potentially because they may have expected rewards for being reported for excellence, was mentioned as contributing towards non-participation. One CHW mentioned that jealousy among CHWs had increased since implementation of the intervention. Uptake of LfE varied among the different sites, which seemed largely due to the role the Site Supervisor played during implementation. When the Site Supervisor acted as champion, and actively encouraged participation, uptake seemed better. However, Site Supervisors at sites where uptake was low mentioned that they had tried to encourage participation, but that CHWs did not want to participate due to failed interventions in the past or due to jealousy and insufficient understanding of the intervention.

After qualitative and quantitative findings were assessed, I synthesised findings by updating the logic model that was developed in Chapter 5. I identified many factors that were present in Chapter 4 or Chapter 5, including the following contextual factors: 'perceived need for the intervention' 'past successes', 'clear communication about intervention', 'buy-in from participants', 'champion commitment', 'safe environment for intervention', 'support from external organisation', 'adequate duration of sessions', 'sufficient access to intervention', and 'reminders to those who have not yet participated'. Identifying these components again helped strengthen their presence in the model. The factors that were identified in more than one study support the theory explaining how interventions based on PP can impact performance of health personnel. However, in the mixed method evaluation I also added two new contextual factors to the logic model: 'time to reflect', which was identified in the systematic review, but not added to the logic model due to oversight, and 'feedback loop closed'.

I identified the following mechanisms that were present in earlier logic models: 'cross-pollination of positive work generates connections', 'feeling of community', 'perceived support of management', 'virtuous acts', 'acknowledging strengths and noting positive practice', 'awareness of positives and what energises people', as well as 'abundance culture'. New mechanisms included 'supervisors' knowledge of performance increases', 'opportunity to praise without having to wait for supervisors', 'intervention for benefit of CHWs themselves', and 'opportunity to recognise colleagues for great work', 'CHWs primed about potential acts of excellence' and 'drive to excel'. I identified four outcomes that were identified in previous studies as well, including 'improved attitudes as a result of work', 'improved knowledge and personal skills/insight into work', 'increased confidence' and 'increased positive emotions'. One new outcome was identified namely: 'emulate excellence in own work'.

10.2 Comparison of findings with literature

In Chapters 4, 5 and 9, I have reflected on the logic model, which was adapted iteratively throughout this thesis, and in this discussion I will mainly highlight some findings that could impact the outcomes of LfE, and compare these to existing literature, before explaining more about motivation as outcome of the LfE intervention.

10.2.1 General findings.

The nomination of CHWs for excellent events could potentially lead to generally low- and average-performing CHWs being nominated and appreciated for their work. While CHWs may not perform well overall, they could still perform an act of excellence, which in turn could demotivate fellow well-performing CHWs, as feared by stakeholders in Chapter 5. This phenomenon has also been identified in a study performed in Uganda, which found that awards being provided to the best-performing CHWs led to a non-significant negative performance of fellow CHWs (271). In the study awards, which were rare as only 3% of CHWs received one, were handed out by supervisors. While low-performing CHWs reacted to the rewards by improving their performance, high-performing CHWs that were not awarded exhibited underperformance (272).

While the feedback loop for the LfE intervention in Neno District had not yet been closed, and no awards had yet been provided to CHWs for being reported for excellence, the idea (which has been co-designed with stakeholders in the CHW team in Neno District) was to provide CHWs with certificates if they had been reported for

excellence. However, as one stakeholder mentioned, awards could lead to people who perform well, but not excellent (and thus do not receive an award), perceiving they are not performing well enough, which may lead to decreased performance, as shown in the Ugandan study (272). As mentioned, in Uganda the provision of awards did lead to better performance of underperforming CHW, while overall performance fell (272)s, which was expected to happen in Neno District as well, according to participants in the mixed method evaluation (described in Chapter 9). I however hoped to limit the potentially negative impact of LfE by not providing monetary or in-kind rewards. Furthermore, reporting was open for everyone, and more than 3% of CHWs were reported for excellence during our study in Neno District, helping to ensure no one felt left out. Hopefully by not providing a monetary or in-kind award, and by allowing everyone to report each other, the potential negative impact of LfE can be limited (272).

Regular challenges in CHW programmes, including transport challenges and lack of resources also impacted the CHW programme in Neno District (80). These challenges may have impacted the LfE intervention as well. Transport challenges were mentioned by stakeholders as a possible impediment to the submission of excellence forms. Transport problems both prevented CHWs from having access to the forms, as well as from submitting forms. To support CHWs, two extra LfE boxes were put in villages far away from the health facility, which encouraged CHWs to participate. Unfortunately, despite these measures, some CHWs mentioned that the forms were not always available to them.

As CHWs are balancing their family duties, farm duties and duties as CHWs, their workloads are high. CHW workloads are described by the interplay of the number of tasks assigned to the CHW, the organisation of the assigned tasks and the catchment area, which includes the number of households and geographic distributions (273). The CHWs in Neno District have many assigned tasks, and in addition the environment is challenging, as houses are distributed widely, and roads are not easily passable. Passage is particularly challenging in the rainy season. High workloads could lead to reduced productivity of CHWs, which in turn impact their organisational performance. Productivity may be increased by providing an enabling work environment, which could be supported by LfE as CHWs feel more appreciated. Including supervisors in LfE, which did not happen in this study, may enable CHWs. Supervisors submitting

an excellence form can help CHWs feel supported, which may lead to increased motivation as well as productivity (273).

Many CHWs reported their colleagues for saving the life of a client, which shows clear impact. An article from the REACHOUT consortium identified elements of CHW programmes that empower CHWs. One of these elements regarded CHWs perceiving a clear and impact of their work. LfE highlights excellent events, which often regard CHWs going above and beyond in helping community members, which could help CHWs realise the impact they have on community members (274).

In a 2018 WHO guideline, the WHO recommended a financial package for CHWs, according to job demands, complexity, number of hours, training, and roles they undertake (275). It is important to note that the CHWs in Neno District work as volunteers but do receive a monthly stipend. However, many stakeholders did not believe the stipend was sufficient according to the workloads and job demands of CHWs in Neno District. I do want to emphasise that for motivation of CHWs, a reliable financial package is important and that LfE is not an alternative or substitute for sufficient financial compensation; it is merely a non-financial incentive that could potentially increase motivation in the workplace, as described in the developed logic model in Chapter 9.

Apart from factors I identified that were present in the theory by Lewis, various factors present in the original theory by Lewis were not identified in this study. For example, in the logic model by Lewis, resilience is one of the potential outcomes of interventions based on positive psychology (109). Resilience was additionally identified in the exploratory study, performed in 2018 in NHS trusts in the UK (15). I have very little information regarding resilience of CHWs in Neno District, but a study has shown that district level health management faces challenging conditions in low- and middle-income countries (LMIC), like Malawi (275). Changes in governance structures, unpredictable payment, resource delays and abruptly imposed policy directives generate internal chronic stresses, which impact workers in the system and to deal with these stresses chronic resilience is needed (276). While previously LfE was shown to impact resilience, in this study I did not identify anything regarding resilience, which may be due to absence of evidence, because there was no evidence that LfE could not impact resilience.

Finally, it should be noted that the implementation of an intervention changes the context of the intervention (188), as described in Pillar 2 in Chapter 3. For CHWs in Neno the implementation of LfE provided an opportunity for appreciating fellow CHWs, something which was not present before the implementation of LfE. CHWs may also learn from the excellent events as they identify and emulate these in their own work, thus improving their performance. Furthermore, the type of excellent event that is reported may change over time. For example, while many excellent events are currently related to timely referral or encouraging defaulting patients to continue treatment, once more CHWs encourage defaulting patients to continue treatment, this could become the new normal and excellent events could become more related to going above and beyond for one particular client, for example.

10.2.2 Learning from Excellence and Appreciative Inquiry for health workers in Malawi

Some of the factors I identified in the logic model were identified by Merriel in their study regarding appreciative inquiry (AI) for healthcare workers in Malawi (130). In terms of contextual factors, they identified 'managerial support', 'stakeholder involvement', 'champion commitment' and 'time to participate', which I also identified. Merriel additionally identified 'celebrations of success' and, 'more supportive relationships', as well as a 'positive experience regarding the AI intervention', with healthcare workers wanted the AI intervention to continue. The latter was a commonly mentioned outcome in the in-depth interviews of the mixed method evaluation as the LfE intervention had phased out, while CHWs mentioned they wanted it to continue. I did not investigate the impact of LfE on patient outcomes, as many factors play a role in this, and I believed this was beyond the scope of the current study. Merriel however showed that after the implementation of AI, patient outcomes seemed to have improved. Merriel did not report the impact of the AI intervention on 'attitudes to work', specifically the impact of AI on how hard healthcare staff work, which was a commonly mentioned outcome of the mixed method evaluation. Other outcomes identified by Merriel, but not by me, included the impact of AI on 'staff creativity', and 'team functioning', as well as 'breaking down of hierarchies' due to implementation of AI (116). This last factor is present in the logic model as we identified it in the systematic review (181), but it was not reiterated in the setting of Neno District.

Merriel did not find a statistically significant improvement in job satisfaction after the implementation of the AI intervention, which was potentially due to other factors impacting job satisfaction, including lack of resources (130). I did not measure job satisfaction alone, but as part of motivation, which did not change after implementation of LfE. However, motivation among CHWs was very high to start with, which could have influenced the lack of improvement. The COVID-19 pandemic, which led to changed workflows may have shaped motivation as well.

10.2.3 Learning from Excellence and motivation of Community Health Workers

Motivation was an important factor for performance of CHWs, as well as other health workers. Motivation is an important intermediate outcome of LfE, as identified in Chapter 4, Chapter 5, and Chapter 9, and could impact organisational performance as explained in Chapter 1 and the logic model.

Motivation pre- and post-implementation of LfE for CHWs in Neno District did not change in a statistically significant way, which may have been due to the very high motivation pre-implementation of LfE. Below I will explain how my findings link with literature regarding CHW motivation, thus building the case for impact of LfE on CHW motivation.

As mentioned previously, LfE can act as a non-financial incentive for CHWs. Incentives are important for CHW motivation. In the study by Ormel et al., the importance of providing incentives according to expectations of CHWs was highlighted, as an expectation gap may lead to demotivation (89). In the mixed method evaluation, presented in Chapter 9, I identified expectations regarding a reward for those reported for excellence. While at some sites participants understood that there would be no financial, or even in-kind gain for CHWs who were reported for excellence, others did not understand this, possibly due to insufficient communication during implementation of the intervention. A lack of reward did act as a demotivating factor for participation in the intervention, but I did not investigate if it demotivated CHWs in their everyday work. PIH suggested that false expectations were potentially due to the nature of the work of non-governmental organisations (NGOs), where rewards are provided for many activities. In the future, communication regarding rewards should be very clear, in order not to encourage false expectations and create an expectation-gap.

In their realist evaluation of a maternal and child health programme in Nigeria, Ebenso et al. identified various mechanisms explaining CHW motivation including: 'fostering peer-support and collegial relations'; 'making staff feel supported, valued and appreciated'; 'creating a comfortable working environment'; and' boosting morale and confidence'(277). A few of the mechanisms I identified regarding LfE correspond with these identified mechanisms, namely the 'opportunity to say something positive about the work of fellow CHWs', 'to celebrate what is working', and 'to help CHWs identify examples of excellent performance, which makes CHWs feel valued'.

Working for the community was identified as factor that could potentially motivate CHWs, as explained in Chapter 1 and studies by Maes et al. and Naimoli et al. (65, 225). Recognition and appreciation of community members for the work done by CHWs is important and could lead to improved motivation (80, 87). Additionally, the importance of community leaders is acknowledged in literature. For example, involving village leaders in the CHW programme is thought to increase respect and credibility for CHWs (70, 278). Relationships with community members, particularly village leaders, and their involvement in the LfE intervention was mentioned in Chapter 5 but did not come up in my mixed method evaluation, possibly as community members were not included as this was beyond the scope of this study.

10.3 Reflexivity

In qualitative research, researcher characteristics influence data collection because the researcher's characteristics and behaviour could impact participants' responses and analysis (279). Reflecting on the researcher characteristics is thus important for trustworthiness of the research (279).

I am a white female from a high-income country, in my twenties. I have been involved in LfE-research since June 2017, and I was thus an outsider to the study setting, but insider to the LfE intervention, which may have impacted the data collection and data analysis (257). For example, due to me being an outsider during the CHWs may have put on their very best performance, which could have happened with anyone observing them. I noticed it during two observations in particular: one where the CHW asked their client to get tested for HIV and the client mentioned the CHW had never discussed this with them before. In another observation, the CHW screened for mental health, which they did not seem to have done before because the client was confused

by the questions and asked the CHW what these were for. However, if CHWs performed better during the observations than in their normal work, this does not affect my findings as the observations were aimed at getting an overview of the tasks assigned to CHWs and the tools they use during these tasks, and not at identifying CHW performance. During the observations one of the observed CHW asked me, the translator, and Site Supervisor to not attend their second household visit as they would be meeting the male household member for the first time and were worried our presence would make the household member uncomfortable. To me this showed that our presence at the household visits impacted the household members as well and may have made them feel uncomfortable. However, it also showed how well CHWs know their households and their willingness to protect household members from visitors that may make them feel uncomfortable.

During the observations, verbal permission was sought from the household members. The decision to do this, as opposed to written formal consent, was based on PIH guidance, and approved by BSREC at the University of Warwick and NHSRC in Malawi. Permission from household members was sought without anyone else present, although it is possible that household members felt obliged to agree to the observation due to their relationship with the CHW (e.g., through a concern that declining the observation may reduce the care provided by the CHW in the future). Additionally, the CHWs ensured that we would not be observing them during visits with vulnerable households, as shown by one CHW who did ask us not to be present during their second household visit. No data was collected from the household members, which is why verbal permission was considered sufficient. In future studies I will consider formal written or oral consent, to further protect household members as the presence of additional people during the household visit may have impacted household members sharing concerns with the CHWs. Community members not sharing concerns may have affected their health, however the CHWs in Neno District conduct regular visits. Allowing community members to share concerns during the next visit.

My position as an outsider may have influenced the interviews with stakeholders, as they may not have felt comfortable discussing the ins and outs of the CHW programme with me. I however met most research participants prior to the interview, and I believe this helped to create rapport and a safe environment for participants, which may have

encouraged them to open up. It should be noted that I felt that interviews with participants that I had not met previously did not go as smoothly and provided me with less detail. On the other hand, being an outsider may have led to stakeholders feeling more comfortable expressing their thoughts to me, particularly as Malawi is a very hierarchical society, and I am not part of the local hierarchy *per se*. However, it should also be noted that I sometimes felt that participants had certain expectations regarding my role, and believed they could learn from me, and were proud that their work would be known about beyond the borders of Neno District.

I do not speak Chichewa and interviews were conducted in English, which may have left some participants unable to express their ideas and opinions as well as when the interviews had taken place in Chichewa. It may have been better to conduct these interviews in Chichewa with the help of a research assistant.

It is important to note that this study would not have been possible without the support of the employed research assistant (RA). Due to their extensive involvement in this study, they may have had an impact on the quality of collected data. Initially the RA was only employed for translation activities and limited reflective activities, during the first round of data collection for Chapter 5, in January 2020. They additionally supported with quantitative data collection, but again in a translator role. As it became clear that I would not be able to travel to Neno District due to the COVID-19 pandemic, together with PIH we decided to employ the RA for support with implementation of LfE and data collection for the mixed method evaluation. The RA had limited experience with qualitative data collection, and I provided some training to support them with data collection. However, they may have interpreted the training differently from how I would have done, which could have impacted what data were collected during the interviews. Additionally, while the RA did not have a paid role with PIH throughout the study, during the implementation of LfE, between August 2020 and December 2020 they were volunteering with PIH, which may have impacted data quality as well. For example, during the observational study they were not employed by PIH, which allowed them to be an outsider of the hierarchy of the CHW programme. However, during implementation of the LfE programme, as well as during collection and follow-up of the forms they were volunteering with PIH. Due to their role with PIH, their encouragements to Site Supervisors to participate in the LfE programme may have led to unintended coercion of the Site Supervisors, who subsequently may

have pressured CHWs working with them to participate in the LfE programme, which may have led to reported forms not reflecting true excellence of CHWs. It is important to note that due to the RA's interaction with various Site Supervisors during their time as volunteer, interview participants may not have felt as free to express their ideas and opinions during the interviews.

On the other hand, I had always intended to employ a translator for the CHW interviews, which were held in Chichewa. Due to changes made to the protocol, as described above, the RA was more involved in this research than initially intended, which meant they had good knowledge of what happened during implementation of LfE, as well as the differences in number of submitted forms for the different sites and the quality of forms submitted at each site. This insight aided them during the interviews and allowed them to effectively follow-up on differences among the various sites.

I believe the data collected seems to reflect what is happening on the ground, as confirmed during informal chats with stakeholders from PIH. However, data may have been improved by allowing a non-PIH research assistant who was from Malawi and fluent in Chichewa as well as English to conduct the interviews in the observational study.

In terms of my insider-status for LfE, this may have impacted data analysis and synthesis as I had prior ideas about what could come out of this study. I have tried not to let my prior knowledge cloud data collection and analysis, and it helped that the setting was different from the setting in which I conducted previous research, namely National Health Service (NHS) Hospitals in the UK.

Throughout data analysis and data synthesis I have asked CHW Team members as well as my supervisors for feedback regarding my findings, to check if the findings seemed logical and corresponded with their experiences of LfE for CHWs in Neno District.

10.4 Strengths

Several strengths have been mentioned in the individual chapters, but I will mention a few regarding the full project. One of the strengths of this study is the collaboration between me and stakeholders in the CHW programme implemented PIH in Neno District. The stakeholders have a thorough knowledge of the CHW Programme and the

local context. With the help of the co-design activities LfE was developed in a way that was considered suitable for local customs and values and feasible for CHWs to use.

Another strength regards the use of theory, as per realist evaluation methodology. I triangulated the findings of the various studies conducted in this thesis with the exploratory study performed in the UK (3), and wider literature regarding important factors for motivation and performance of CHWs. My findings seem to be consistent with existing theories in the field of CHW motivation and performance. The logic model I developed as part of this study will add to the literature in this field. This logic model has practical use as designers and implementers of LfE interventions for health workers can use it to support design and implementation in their local context. The model developed in this study consists of factors that are specific for the CHWs in Neno District, however, I have showed that various factors have been identified in previous research in the UK, as well as in the systematic review, presented in Chapter 4, which mainly included studies performed in high-income settings. So, while this study focused on the context of CHWs in Neno District, the methodology I used aimed to enhance generalisability of the results, so they could inform design and implementation of LfE or similar interventions in other settings.

Another strength regarded the ownership of PIH of the LfE intervention, which was achieved through co-design activities. Due to the COVID-19 pandemic I was unable to travel to Malawi to support the implementation of the pilot. However, I soon realised that with the help of the co-design activities and in-depth interviews performed as part of the observational study, stakeholders had developed in-depth knowledge of the LfE intervention, which allowed them to implement it in Neno District.

10.5 Weaknesses

The research proposal was designed before the COVID-19 pandemic, and due to the pandemic I was unable to perform all the activities as originally planned. Due to the pandemic, I was unable to travel to Neno District to implement the pilot and collect data for the mixed method evaluation. Additionally, I originally planned to integrate the LfE form into the mobile health (mHealth) application as used by CHWs in two of the fourteen catchment areas in Neno District. Due to the pandemic, workflows of CHWs changed and stakeholders were sometimes unable to travel to Neno District.

This impacted implementation activities as well as data collection activities. I coordinated the implementation and data collection from the UK, while the RA and CHW Programme Officers were responsible for the implementation of the LfE programme. This seems to have led to some omissions.. For example, communication of LfE was not sufficiently clear for CHWs and it took them a while to understand the intervention, and many expected rewards. Furthermore, due to a mistake on my part, no paired data was available for Site F. Additionally, no LfE forms were submitted at Site N, while at other sites almost all CHWs participated in the programme. Standardised implementation, with more training provided to the Site Supervisors and additional support for the CHW Programme Officers and RA, who implemented the programme, could have improved consistency among sites. However, I did investigate variation among sites where the CHW Programme Officer introduced LfE and the sites where the RA introduced LfE, I did not identify any consistent differences that could explain data variation. With more hands-on guidance these omissions potentially could have been prevented.

As described in Chapter 8 I was uncertain if CHWs fully understood the various multiple-choice options on the LfE forms because the explanations provided for certain types of excellent events did not always seem to match with the type of excellent event. For example, explanations provided for 'advocated well on behalf of the client' regarded supporting a defaulting patient back into care instead of advocating on behalf of patients when they or their guardian/family are unable to do so. The lack of understanding of the form may have confused CHWs when filling it in. Additionally, lack of understanding may have led to excellent events not being reported, as CHWs did not identify the type of event on the list. Finally, CHWs may not have understood the difference between 'advocated well on behalf of the patient', 'counselling a patient on treatment adherence' and 'supporting a defaulting patient back into care', as the explanations provided for these types of events were very similar.

Due to COVID-19 the pilot was implemented three months later than originally planned, which left me with little time between full roll-out and data collection for the mixed method evaluation. As it took CHWs a while to wrap their heads around the intervention, and no feedback had been provided by the time I collected my data, this could have impacted outcomes of the intervention and thus of the findings of this research. The study by Meyers et al. regarding the quality implementation framework,

as presented in Chapter 7, highlighted the importance of building capacity, so the organisation has sufficient capacity, or participants are sufficiently ready for the intervention to be implemented (262). I did not conduct activities specifically aimed at building capacity and readiness, but through the co-design activates some capacity was created. The mixed method evaluation showed that CHWs had issues understanding the LfE intervention, which could have potentially been prevented by spending some time on building capacity among Site Supervisors and CHWs. This could have been done by, for example, again LfE to Site Supervisors during a Site Supervisor meeting, and by introducing LfE in a quarterly training, before implementing it during pay-day.

Apart from impacting this research, COVID-19 also impacted roles of CHWs, which may have impacted their motivation. However, in Neno District, CHW roles were clearly described, management coordinated adaptations, and CHWs were trained in preventive measures to recognise COVID-19 symptoms and how to perform their roles while socially distancing. Therefore, impact of change in workflows may have been limited, as all factors described above are important for CHW motivation.

As mentioned previously, including the community in CHW interventions is important, as well as securing community commitment to CHW programmes. However, I did not include community members in this research due to limited time available. Not including community members, who are the recipients of CHW care, and who are thus able to identify what they deem CHW excellence, may have led to gaps in knowledge regarding CHW acts of excellence, particularly as CHWs themselves usually work alone, making it difficult to identify excellence of fellow CHWs.

The questionnaire used to assess motivation of CHWs in Chapter 9 was not validated but based on other questionnaires. I was advised to only pick ten questions, and together with stakeholders in the CHW programme we decided to look at perceived supervision as well. Originally we believed LfE could potentially improve supervision of CHWs, as explained in Chapter 6 and Chapter 9. SCHWs would be informed when a CHW assigned to them was reported for excellence, which would increase their knowledge about CHW performance and could potentially lead to better targeted and more supportive supervision Throughout the study I however realised that while LfE can improve a sense of community, I did not identify any impact regarding supervision

in both the observational study and the mixed method evaluation. CHWs mainly used the LfE intervention to report their fellow colleagues, and no feedback loop was in place yet, as this was not yet designed. While the mixed method evaluation shows the feedback loop is important, and in future should be designed before implementation of LfE, the evaluation provided me with important information regarding the feedback loop. While conversations around the feedback loop initially regarded providing in-kind incentives for reported CHWs, the evaluation highlighted issues around jealousy among CHWs and CHWs reporting one another so as they would both benefit, which may have led to reports regarding everyday performance and no excellence. The results of the roll-out and mixed method evaluation will inform the design of a feedback loop.

In the period since we decided to develop the questionnaire used for collecting quantitative data in the mixed method evaluation, two new questionnaires regarding CHW motivation have been published (88, 280). A 2020 study aimed at developing a more rigorous scale to study health worker motivation. The scale developed in this study included 12 items and measured the constructs of organisational commitment, job satisfaction and work conscientiousness, as well as community commitment. In my questionnaire the first two of these factors were included, but not the latter two (88). In future work it may be important to look at work conscientiousness as this seems to be more impacted by LfE than perceived supervision. In 2021 Gottert et al. developed a multi-dimensional scale to measure CHW motivation, including the following dimensions: quality of supervision (6 items), compensation and workload (5 items), feeling valued and capacitated in work (6 items), peer respect and support (5 items). 'Peer respect and support' seems particularly relevant for assessing LfE with questions including questions '*support your co-workers give in your work'* and '*respect received from other CHWs on performing well'*. However, this questionnaire was not yet available when I conducted this study. For those implementing LfE for CHWs in the future, it may be a valuable questionnaire to identify differences pre- and post-implementation of LfE. (280).

This study, apart from the systematic review, has been conducted in Neno District, and various findings may not be generalizable to other settings. As explained above however, the logic model was developed from the systematic review and the explora-

tory study, as well as with the findings in Neno District. Using realist evaluation methodology and theory regarding CHW motivation and performance, I have identified that various factors of the logic model are recognised as important for CHW motivation or performance in different settings and programmes.

10.6 Recommendations

Below are recommendations regarding future use of the LfE intervention, as well as recommendations regarding future research regarding interventions like LfE for CHWs and other health professionals.

10.6.1 Recommendations regarding the LfE intervention

It seemed to take CHWs a while to wrap their heads around the LfE intervention and misunderstanding could have potentially been prevented by introducing the intervention earlier in the year to the Site Supervisors, and by providing additional training regarding the LfE intervention. As mentioned in the logic model, communication about the intervention should be clear, and no false expectations (for example, the expectation of CHWs that they would be rewarded for being reported for excellence) should be present. This risk could potentially be minimised by clear communication about the intervention. Furthermore, recommendations for the form, as identified in Chapter 8, should be implemented to make the form easier to use and potentially more understandable for CHWs. Suggested adaptations include merging 'supporting a defaulting patient into care' and 'counselling a client on treatment adherence' into one type of excellent event. Additionally, the 'advocating on behalf of a client' event should be further explained to CHWs to improve their understanding.

As mentioned in Chapter 1, success and sustainability of CHW programmes requires ongoing investment in quality training, supervision, mentoring and organisational support (56). The LfE intervention could potentially contribute to this as managers and supervisors are provided with information about what is going well within the CHW programme. In future, other cadres of health workers could be included in the LfE intervention. We did intend for this to happen, but potentially due to miscommunication, this didn't realise. Involving health professionals from all levels of hierarchy may help CHWs to feel supported and improve their trust in the health system, thereby improving motivation, as explained in previous research (278). Additionally, involving different cadres could help create a feeling of community, which in turn could impact the abundance culture, as explained in the developed logic model.

Due to the importance of community members, including village leaders, in recognising, appreciation and thereby motivating CHWs, in the future, community members could be included in the implementation of LfE. For example, community members could be given the opportunity to report on acts of excellence of CHWs, or feedback on acts of excellence could be provided during village meetings. This could lead to increased perceived support for CHWs, leading to enhanced credibility and community trust.

Finally, for the LfE intervention it is important that the feedback loop is in place, so CHWs know they have been reported for excellence, and others can learn from the acts of excellence that have taken place. While this is planned as part of the LfE intervention, it has unfortunately not yet been implemented in Neno District. This delay may have led to some demotivation as CHWs did not know what was happening with the reports the filled in. The feedback loop should be designed and implemented as soon as possible.

10.6.2 Recommendations regarding future research

In this thesis the qualitative research focused on the views of stakeholders, Site Supervisors and CHWs on the existing CHW programme and/or the LfE programme. However, I did not explore what the stakeholders, Site Supervisors and CHWs ideas are regarding excellent performance. To better understand the data produced in LfE programmes, future research should explore what constitutes excellence from the perspectives of various stakeholders in the healthcare programmes in which LfE is implemented, either for CHWs or for healthcare workers in general. This exploration into excellence should include community members and/or patients as well. This will provide those implementing programmes like LfE a better understanding of what excellence entails in the context of the programme and organisation in which LfE will be implemented. The exploration will additionally aid future evaluators of LfE programmes why the programme produced the data it did and may provide a better understanding of if the programme led to desired results.

No randomised controlled trials have been conducted regarding LfE for health workers or CHWs. However, as the systematic review in Chapter 4 and the outcomes of this thesis have shown, there is a growing body of evidence that suggests interventions like LfE could potentially improve various intermediate outcomes, including motivation

of health workers and increased positive emotions, which could lead to improved organisational performance. As mentioned above, I did not identify an impact of LfE on resilience of CHWs and further research is needed to generate a better understanding of strategies or underlying organisational capacities that could lead to better resilience among CHWs (276).

With the help of a randomised controlled trial, quantitative outcome measures of an LfE intervention could be assessed. A qualitative component could subsequently help explain differences between various settings, and recommend for whom, where and when an LfE intervention could lead to most impact. If a randomised controlled trial is not possible, studies regarding the quantitative outcomes of the LfE intervention could be performed to identify if the intermediate outcomes (as identified in the logic model) indeed improve due to the implementation of LfE for health workers.

Ideally, once the feedback loop is completed, the impact of LfE for CHWs in Neno District should be assessed again to determine their thoughts and ideas regarding the LfE intervention. This would also allow for more long-term data collection, as all LfE studies I was involved in only evaluated LfE after it had run less than a year. A long-term study of impact, in both the UK and Neno District are important to identify impact once LfE is no longer new. Additionally, long-term data could also inform how the logic model stands up over time. While the research I have been involved in mainly focuses on health workers, an LfE intervention could be useful for other professionals, for example, in social care services.

10.7 Conclusion

I co-designed and implemented an LfE intervention for CHWs, together with stakeholders in the CHW programme in Neno District. CHWs liked the LfE intervention, and many participated by reporting on acts of excellence of their fellow CHWs.

I have developed a logic model that explains how the co-designed LfE intervention could impact intermediate outcomes, among which motivation, and organisational performance of CHWs in Neno District, including important contextual factors and mechanisms that lead to these outcomes. The logic model can be used to inform those designing and implementing interventions like LfE for CHWs, as well as for other health workers in low-resource, as well as high-resource settings.

While LfE was paused for a few months in Neno District, it was reintroduced and is currently still running. Together with stakeholders, I aim to adapt the LfE intervention according to recommendations and encourage CHWs to continue appreciating one another for excellent work.

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APPENDIX 1 SEARCH STRATEGY SYSTEMATIC REVIEW

Psychinfo - 433

1.	exp Health Personnel/
2.	(allergist* or allied health personnel or anatomist* or anesthetist* or anesthesiologist* or cardiologist* or dentist* or dermatologist* or doctor* or emergency medical technician* or emergency physician or endocrinologist* or family physician* or gastroenterologist* or general practitioner* or geriatrician* or gerontologist* or gyneaecologist* or gynecologist* or health personnel or hematologist* or hospitalist* or immunologist* or intensivist* or internist* or medical faculty or medical staff or midwi* or neonatologist* or nephrologist* or neurologist* or neurosurgeon* or nurse* or nursing faculty or nutritionist* or obstetrician* or occupational health physician* or occupational therapist* or oncologist* or ophtalmologist* or optometrist* or orthopedic surgeon* or otolaryngologist* or paediatrician* or pathologist* or pharmacist* or pharmacy technician* or physical therapist* or physician* or podiatrist or primary care physician* or psychiatrist* or pulmonologist* or radiologist* or rheumatologist* or surgeon* or urologist* or women physician*)
3.	(basic health worker* or birth attendant* or community health agent* or community health aide* or community health assistant* or community health extension worker* or community health nurse* or community health officer* or community health promotor* or community health surveyor* or community health volunteer* or community health worker* or community-based practitioner* or family health worker* or frontline health worker* or health auxiliar* or health extension worker* or lady health worker* or lay health worker* or traditional birth attendant* or village health volunteer* or village health worker* or volunteer health worker*)
4.	1 or 2 or 3
5.	(appreciative inquiry or 4d cycle)
6.	Positive psychology/
7.	(strength-based or strength*) adj4 coaching
8.	positiv* adj4 coaching
9.	positiv* adj4 feedback
10.	excellen* adj4 feedback
11.	(strength-based or strength*) adj4 feedback
12.	5 or 6 or 7 or 8 or 9 or 10 or 11
13.	4 and 12
14	Limit 13 to English language

Embase - 2795

1.	exp health care personnel/
2.	(allergist* or allied health personnel or anatomist* or anesthetist* or anesthesiologist* or cardiologist* or dentist* or dermatologist* or doctor* or emergency medical technician* or emergency physician or endocrinologist* or family physician* or gastroenterologist* or general practitioner* or geriatrician* or gerontologist* or gyneaecologist* or gynecologist* or health personnel or hematologist* or hospitalist* or immunologist* or intensivist* or internist* or medical faculty or medical staff or midwi* or neonatologist* or nephrologist* or neurologist* or neurosurgeon* or nurse* or nursing faculty or nutritionist* or obstetrician* or occupational health physician* or occupational therapist* or oncologist* or ophtalmologist* or optometrist* or orthopedic surgeon* or otolaryngologist* or paediatrician* or pathologist* or pharmacist* or pharmacy technician* or physical therapist* or physician* or podiatrist or primary

	care physician* or psychiatrist* or pulmonologist* or radiologist or rheumatologist* or surgeon* or urologist* or women physician*)
3.	(Basic health worker* or birth attendant* or community health agent* or community health aide* or community health assistant* or community health extension worker* or community health nurse* or community health officer* or community health promotor* or community health surveyor* or community health volunteer* or community health worker* or community-based practitioner* or family health worker* or frontline health worker* or health auxiliar* or health extension worker* or lady health worker* or lay health worker* or traditional birth attendant* or village health volunteer* or village health worker* or volunteer health worker*)
4.	1 or 2 or 3
5.	(appreciative inquiry or 4d cycle)
6.	Positive psychology
7.	(strength-based or strength*) adj4 coaching
8.	positiv* adj4 coaching
9.	positiv* adj4 feedback
10.	excellen* adj4 feedback
11.	(strength-based or strength*) adj4 feedback
12.	5 or 6 or 7 or 8 or 9 or 10 or 11
13.	4 and 12
14	Limit 13 to English language

Medline - 1058

1.	exp Health Occupations/
2.	exp Health Personnel/
3.	(Basic health worker* or birth attendant* or community health agent* or community health aide* or community health assistant* or community health extension worker* or community health nurse* or community health officer* or community health promotor* or community health surveyor* or community health volunteer* or community health worker* or community-based practitioner* or family health worker* or frontline health worker* or health auxiliar* or health extension worker* or lady health worker* or lay health worker* or traditional birth attendant* or village health volunteer* or village health worker* or volunteer health worker*)
4.	(allergist* or allied health personnel or anatomist* or anesthetist* or anesthesiologist* or cardiologist* or dentist* or dermatologist* or doctor* or emergency medical technician* or emergency physician or endocrinologist* or family physician* or gastroenterologist* or general practitioner* or geriatrician* or gerontologist* or gyneaecologist* or gynecologist* or health personnel or hematologist* or hospitalist* or immunologist* or intensivist* or internist* or medical faculty or medical staff or midwi* or neonatologist* or nephrologist* or neurologist* or neurosurgeon* or nurse* or nursing faculty or nutritionist* or obstetrician* or occupational health physician* or occupational therapist* or oncologist* or ophtalmologist* or optometrist* or orthopedic surgeon* or otolaryngologist* or paediatrician* or pathologist* or pharmacist* or pharmacy technician* or physical therapist* or physician* or podiatrist or primary care physician* or psychiatrist* or pulmonologist* or radiologist* or rheumatologist* or surgeon* or urologist* or women physician*)
5.	1 or 2 or 3 or 4
6.	(appreciative inquiry or 4d cycle)
7.	Positive psychology
8.	(strength-based or strength*) adj4 coaching

9.	(strength-based OR strength*) adj4 feedback
10.	positiv* adj4 coaching
11.	positiv* adj4 feedback
12.	excellen* adj4 feedback
13.	6 or 7 or 8 or 9 or 10 or 11 or 12
14.	5 and 13
15.	Limit 14 to English language

Scopus - 1605

TITLE-ABS-KEY ((("health personnel" OR "health occupation" OR "allergist*" OR "allied health personnel" OR "anatomist*" OR "anesthetist*" OR "anesthesiologist*" OR "cardiologist*" OR "dentist*" OR "dermatologist*" OR "doctor*" OR "emergency medical technician*" OR "emergency physician*" OR "endocrinologist*" OR "family physician*" OR "gastroenterologist*" OR "general practitioner*" OR "geriatrician*" OR "gerontologist*" OR "gynaecologist*" OR "gynecologist*" OR "hematologist*" OR "hospitalist*" OR "immunologist*" OR "intensivist*" OR "internist*" OR "medical faculty" OR "medical staff" OR "midwi*" OR "neonatologist*" OR "nephrologist*" OR "neurologist*" OR "neurosurgeon*" OR "nurse*" OR "nursing faculty" OR "nutritionist*" OR "obstetrician*" OR "occupational health physician*" OR "occupational therapist*" OR "oncologist*" OR "ophtalmologist*" OR "optometrist*" OR "orthopedic surgeon*" OR "otolaryngologist*" OR "paediatrician*" OR "pathologist*" OR "pharmacist*" OR "pharmacy technician*" OR "physical therapist*" OR "physician*" OR "podiatrist*" OR "primary care physician*" OR "psychiatrist*" OR "pulmonologist*" OR "radiologist" OR "rheumatologist*" OR "surgeon*" OR "urologist*" OR "women physician*") OR ("basic health worker*" OR "birth attendant*" OR "community health agent*" OR "community health aide*" OR "community health assistant*" OR "community health extension worker*" OR "community health nurse*" OR "community health officer*" OR "community health promotor*" OR "community health surveyor*" OR "community health volunteer*" OR "community health worker*" OR "community-based practitioner*" OR "family health worker*" OR "frontline health worker*" OR "health auxiliar*" OR "health extension worker*" OR "lady health worker*" OR "lay health worker*" OR "traditional birth attendant*" OR "village health volunteer*" OR "village health worker*" OR "volunteer health worker*")) AND (("appreciative inquiry" OR "4D cycle") OR ("positive psychology") OR (("strength-based" OR "strengths") W/4 coaching) OR (("strength-based" OR "strengths") W/4 feedback) OR ("excellen*" W/4 feedback) OR ("positiv*" W/4 coaching) OR ("positiv*" W/4 feedback)))

CINAHL - 1058

1.	(("health personnel" OR "health occupation" OR "allergist*" OR "allied health personnel" OR "anatomist*" OR "anesthetist*" OR "anesthesiologist*" OR "cardiologist*" OR "dentist*" OR "dermatologist*" OR "doctor*" OR "emergency medical technician*" OR "emergency physician*" OR "endocrinologist*" OR "family physician*" OR "gastroenterologist*" OR "general practitioner*" OR "geriatrician*" OR "gerontologist*" OR "gynaecologist*" OR "gynecologist*" OR "hematologist*" OR "hospitalist*" OR "immunologist*" OR "intensivist*" OR "internist*" OR "medical faculty" OR "medical staff" OR "midwi*" OR "neonatologist*" OR "nephrologist*" OR "neurologist*" OR "neurosurgeon*" OR "nurse*" OR "nursing faculty" OR "nutritionist*" OR "obstetrician*" OR "occupational health physician*" OR "occupational therapist*" OR "oncologist*" OR "ophtalmologist*" OR "optometrist*" OR "orthopedic surgeon*" OR "otolaryn-

	gologist*" OR "paediatrician*" OR "pathologist*" OR "pharmacist*" OR "pharmacy technician*" OR "physical therapist*" OR "physician*" OR "podiatrist*" OR "primary care physician*" OR "psychiatrist*" OR "pulmonologist*" OR "radiologist" OR "rheumatologist*" OR "surgeon*" OR "urologist*" OR "women physician*") OR ("basic health worker*" OR "birth attendant*" OR "community health agent*" OR "community health aide*" OR "community health assistant*" OR "community health extension worker*" OR "community health nurse*" OR "community health officer*" OR "community health promotor*" OR "community health surveyor*" OR "community health volunteer*" OR "community health worker*" OR "community-based practitioner*" OR "family health worker*" OR "frontline health worker*" OR "health auxiliar*" OR "health extension worker*" OR "lady health worker*" OR "lay health worker*" OR "traditional birth attendant*" OR "village health volunteer*" OR "village health worker*" OR "volunteer health worker*"))
2.	(MH "Health Personnel+")
3.	(MH "Health Occupations+")
4.	S1 OR S2 OR S3
5.	"positive psychology"
6.	"appreciative inquiry"
7.	(strength-based OR strength*) n4 coaching
8.	positiv* n4 coaching
9.	positiv* n4 feedback
10.	excellen* n4 feedback
11.	(strength-based OR strength*) n4 feedback
12.	S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11
13.	S4 AND S12

APPENDIX 2 QUALITY APPRAISAL

Table Appendix 2.1 Overview of quality for individual categories

	Title and abstract		Introduction			Methods							Results	Discussion				
Study	T	A	B	LP	I	Q	E	S	P	PS	M	As	O	Su	R	L	In	C
Ammentorp	+	+	+	-	+/-	++	-	-	++	+/-	+	+	+/-	+	+	-	-	+
Austin	-	N/A	+/-	-	+	-	-	-	+/-	-	+/-	-	-	-	-	-	-	-
Bergs	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Buck	+/-	N/A	+	+	+	+	+/-	-	-	+/-	+/-	-	+/-	+/-	-	+/-	-	-
Bolier	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+/-	+	+
Challis	+/-	N/A	-	+	-	-	-	+/-	+/-	-	-	-	-	+/-	-	-	-	+/-
Dematteo	+/-	+	+	+	+	+	+	-	-	-	-	-	-	+/-	+	-	+/-	+
Dewar	+	+	+	+	+	+	+	+	+	+/-	-	-	+/-	-	-	+/-	-	+/-
Eastburg	-	+/-	+	-	-	+	+	+/-	+/-	-	+	-	+/-	+	+	+/-	+	+
Gray	+	+/-	+	+	+	-	+	-	+	+	+	+	+	+	+/-	+	+	+
Guzman1	+	+	+	-	+	+	-	-	+	-	+	+	+	+	+/-	+/-	+	+
Guzman2	+	+	+	-	+/-	+	-	-	+	+	+	+/-	+/-	+	+/-	+	+	+
Hall	+	+	+/-	-	+/-	+	+	+/-	+	-	+	+	+	+	+	+/-	+	+
James1	+	+	+	+	+	+	+	-	+	-	+	+	-	-	+/-	+	+	+
James2	-	+/-	+	-	+	+	-	-	-	-	+/-	+	-	+/-	+/-	-	-	-
Kavanagh	+	+	+/-	-	+	+	+/-	-	+	-	-	+/-	+	-	+	+	+	+
Kielar	+	+	-	-	+	+	-	-	+	-	+	-	-	-	-	-	+	+
Knibbs	+/-	+/-	-	+	+	-	+	-	-	-	+/-	-	+/-	-	+/-	+/-	-	+
Macafee	+/-	+	+	-	-	+/-	+	+	+	-	-	-		-	-	+	+	+
Muha	-	N/A	+/-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Palamara	+/-	+	+	-	+	-	-	+/-	+	+/-	+/-	-	+	-	-	+/-	+	+

Ruhe	+/-	+	+	-	+	+/-	-	+	+	+	+	+	+/-	+	+	+	+	-
Hussein	+	+	+	+	+	+	+/-	+	+	+	+	+	+	+	+/-	+	+	+/-
Sharma	+	+	+	+	+	+	+/-	+/-	+	-	+	+	+	+	+/-	+	+	+
Shendell-Falik	+/-	-	+/-	+	+	+	-	+	+	-	-	-	-	-	-	-	-	+
Siu	+/-	+	+	-	+	+	-	+/-	+	-	+	+	-	+	+	+/-	+	+/-
Stefaniak	-	-	-	+	+	-	-	+/-	+	-	-	-	-	+/-	-	-	-	+
van Agteren	+/-	+	+	-	+/-	+	-	-	+/-	-	+	+	+/-	+/-	-	+/-	-	+/-
Wright	+/-	+	+	-	+	+	+/-	-	+/-	-	+	+	+/-	-	+	-	+/-	-
Yu	+/-	+	-	-	+/-	+	-	-	+	+/-	+	-	+/-	+	+	+	+	+

A = Abstract
As = Analysis
B = Background
C = Conclusion
E = Ethical Issue
I = Intended improvement
In = Interpretation
L = Limitation
LP = Local Problem
M = Method of Evaluation
O = Outcome
P = Planning the intervention
PS = Planning the study of the intervention
Q = Study Question
R = Relation to other evidence
S = Setting
Su = Summary
T = Title

	Overall Title - Abstract	Overall Introduction	Overall Method	Overall Results	Overall Discussion	Overall Total
Ammentorp	+	+/-	-	+/-	-	-
Austin	-	-	-	-	-	-
Bergs	+	+	+	+	+	+
Buck	+/-	+	-	+/-	-	-
Bolier	+	+	+	+	+	+
Challis	+/-	-	-	-	-	-
Dematteo	+	+	-	-	+/-	-
Dewar	+	+	-	+/-	-	-
Eastburg	-	-	-	+/-	+	+/-
Gray	+/-	+	+	+	+	+
Guzman1	+	+	-	+	+/-	+/-
Guzman2	+	+/-	-	+/-	+	+/-
Hall	+	+/-	+/-	+	+	+
James1	+	+	-	-	+/-	+/-
James2	-	+	-	-	-	-
Kavanagh	+	+/-	-	+	+	+/-
Kielar	+	-	-	-	-	-
Knibbs	+/-	-	-	+/-	-	-
Macafee	+/-	-	-		-	-
Muha	-	+/-	-	-	-	-
Palamara	+	-	-	+	-	-
Ruhe	+	+/-	+	+/-	+	+/-
Hussein	+	+	+	+	+/-	+
Sharma	+	+	-	+	+	+
Shendell-Falik	-	+	-	-	-	-
Siu	+	+	-	-	+/-	-

Stefaniak	-	-	-	-	-	-
van Agteren	+	+/-	-	+/-	-	-
Wright	+	+	-	+/-	-	-
Yu	+	-	-	+/-	+	-

APPENDIX 3 EXTRACTED DATA SYSTEMATIC REVIEW

First author and year	Study type	Country	Setting	Participants	Intervention	Outcomes
Ammentorp, 2013	Qualitative study. Individual semi-structured interviews.	Denmark	Health Services Research Unit in a hospital	Two nurses, one occupational therapist, one physiotherapist and one medical secretary.	Individual face-to-face coaching sessions, aimed at helping clients gain new perspectives on existing tasks and challenges. Sessions lasted for approximately 1.5 hours and were provided by an independent trained coach. Number of sessions and time interval between sessions was based on individual need. Methods used were common to most coaching programmes.	Two dominant themes described experiences: progressive insight into job, which raised potential for mutual prioritizing, action, and increased job satisfaction (mentioned by 4/5 participants). Secondly, participants mentioned the coaching led to insight into being a constructive colleague at work. Time between sessions allowed for deep reflection and the coach supported moving from diffuse thoughts to a full picture.
Austin, 2017	Quantitative study. Pre-test post-test study.	United Kingdom	University Hospital	Midwives (n=70)	A development day, away from the hospital, intended to enhance wellbeing and increase postivity in which midwives learn skills to help them be more compassionate and nurturing to themselves. Behaviours, habits, and motivations were discussed. With the help of psychotherapy tools views and beliefs were reframed. Positive behaviour change was encouraged both at work and away from the workplace.	Scores of Warwick Edinburgh Mental Wellbeing Scale: Pre-intervention : 43/70 (SD=NA, p=NA, t= NA) After intervention: 55/70 (SD=NA, p=NA, t= NA) After the intervention participants said they understood colleagues behaviour better (36% vs. 72%), they were more optimistic about the future (40% vs. 72%), feel better about themselves (16% vs. 60% feels often or always good) and feel less worried about going to work on Monday (8% vs. 48%) ($\chi 2$=NA, p=NA).
Bergs, 2017	Quantitative study. Quasi-experimental non-equivalent control group pre-test post-test design.	Belgium	Emergency Department in a general hospital with 326 beds in 14 wards.	Nurses in the Emergency Department (pre-intervention n=66, post-intervention n=64)	Tailor-made variant of the 4D cycle of AI consisting of four learning activities focused on excellent handover. Aimed at facilitating communal appraisal in assessing and understanding ways in which structured handover and procedure affect nurses. Two 4.5-hour sessions were held, participation was mandatory and counted as work-time. Sessions led by an ED nurse with proficient knowledge of AI.	No significant changes were seen for Ward and ICU participants: Quality of information change score -3.99 (PRE =64.99, SD 10.82, range (30.56-88.89), POST = 61.00, SD=13.75, range (19.44-86.11), p=0.13). Interaction and support change score -3.21 (PRE=78.11, SD=15.34, range (36.67-100.00), POST=74.90, SD 16.27, range (36.67-100.00), p=0.32). Relevance of information change score -2.22 (PRE=47.64, SD=12.27, range (16.67-66.67), POST=45.42, SD=13.26, range (16.67-83.33), p=0.22). In the emergency department quality of information improved, but not significantly: change score 1.92 (PRE=75.85, SD=9.03, range (55.56-88.89), p=0.66). Interaction and support increased significantly: change score 15.9 (PRE=66.67, SD=18.86, range (30-90), POST=82.56, SD=12.78, range (60-100), p=0.04). No significant change was found in relevance of information: change score 0.64 (PRE=44.23, SD=10.96, range (25-66.67), POST=44.87, SD=14.65, range (25-83.33), p=0.93).

Bolier, 2014	Quantitative study. A cluster-randomised controlled trial.	Netherlands	Large academic hospital.	Nurses and allied health professionals (n=178 in online group and n=188 in control group)	Personalised feedback after an online screening on the following aspects: impaired work functioning, distress, work-related fatigue, risky drinking behaviour, depression, anxiety, and post-traumatic stress. When screened positive a minimum of two interventions was offered as well as personalised advice. In the case of one complaint or a negative screening Psyfit was offered, this is a course aimed at enhancing well-being and mental fitness based on positive psychology, cognitive behaviour therapy and mindfulness principles. Control group filled in screening as well, after 6 months same interventions as in online group were offered.	Participation rate was 32%. Positive mental health was enhanced in the online group compared to the control group group*time F=3.46, p=0.03, Cohen's Δd=0.37 after 3 months and Cohen's Δd= 0.28 after 6 months. Overall wellbeing didn't change (F=2.30, p=0.10) Cohen's Δd=0.35 after 3 months and Cohen's Δd=0.13 after 6 months. Work engagement was significantly better in the online group compared to the control group (F=3.44, p=0.03, Cohen's Δd=0.25 after 3 months and Cohen's Δd=0.15 after 6 months), although this seemed due to deterioration in the control group, instead of enhancement in the intervention group. Depression and anxiety didn't change significantly (Depression: F=1.54, p=0.22 Cohen's Δd=0.11 after 3 months and Cohen's Δd=0.25 after 6 months) (Anxiety: F=0.03, p=0.97 Cohen's Δd=-0.01 after 3 months and Cohen's Δd=0.04 after 6 months)
Buck, 2017	Quantitative study. Pre-test post-test study.			Registered Nurses in float pool (n=NA)	A 6-hour AI summit held onsite. Members were asked to identify most rewarding aspects of being in the float pool. There was an opportunity to discuss their float pool experiences and how it impacted them personally and professionally in smaller groups.	23 nurses completed the pre-survey which 22 completed the post-survey as well. The Sense of Community Index changed from 43.5 to 44.6 (t=0.937, p=0.36), which was not significant. Membership improved from 9.5 to 9.7 (t=0.287, p=0.78), influence from 11.6 to 12.5 (t= 1.682, p=0.11), reinforcement of needs from 11.2 to 10.9 (t = -0.637, p=0.53) and shared emotional connection from 11.1 to 11.5 (t=0.833, p=0.41).
Challis, 2009			A 200-bed acute care hospital	33 RN and LPN in meetings, 48 RN and LPN in questionnaire	AI was introduced throughout the organisation in multiple staff meetings and handouts. Organisational leadership received instruction about the AI framework and its relation to the retention improvement initiative. Nurses were encouraged to attend task group meetings in which random blending fostered cross-pollination of examples of positive work environments. No financial compensation for participation was provided and thus questionnaires were held to obtain essential input.	Vacancy rates improved from 12.1% to 8.9% but there was no verifiable link.

Dematteo,2010	Qualitative study. Semi-structured individual interviews.	USA	13 teaching hospitals	Nursing (n=51), medicine (n=21), social work (n=19), physiotherapy (n=14), occupational therapy (n=13), pharmacy (n=12), psychology (n=10), clinical management (n=19), speech and language therapy (n=5)	Ai as underpinning philosophy of interprofessional education initiative.	166 individual interviews were conducted: 62 interviews before programme delivery and 104 after. 82 participants were programme developers and 84 were learners. Four key themes were identified: contextualizing the appeal of AI, the dual nature of AI, a language of transformation and challenges of AI. The positivity as contrast to problem-based approach was welcomed and favoured by many. Some were sceptical due to a history of failed organisational projects. Some viewed AI as management strategy for advancing corporate goals, others viewed it as empowering. AI was useful in getting staff to talk and share their thoughts. Some participants were not certain about the benefits of using AI, they noted the approach lacked critical analysis, evidence, or root cause approach understanding the nature of instigating and sustaining organisational change. Others were less convinced about the AI language of positivity, which they saw as containing little substance. Some were unsure how AI would cascade down.
Dewar, 2017	Qualitative study	UK	Care home	48 staff members	Adapted AI existing of the following phases: discover, envision, co-create, and embed. In the discovery phase what works well is identified, findings are fed back to participants to envision a desired future which was followed by co-creation with staff, residents, and families. In the embed phase the co-created interventions were embedded. Six face to face meetings were held in the first two months after which staff was invited to join a core group. Six staff members volunteered.	A range of positive interactions that mattered to staff were identified. In the envision phase practice statements were developed which represented a shared vision of what participants valued and would like to happen more of the time. Several ideas for development were pursued, among which an intervention raising awareness of language being used. This led to staff learning more about themselves as people. Confidence of staff increased, particularly in terms of asking questions that really heard each other's perspective. Observation is used more to notice what is working well. New insights resulted in enhanced individual and team morale producing positive forward momentum.
Eastburg, 1994	Qualitative study. Quasi-experimental control group pre-test post-test design.	USA	A 150-bed private medical hospital	76 staff nurses working in emergency, intensive-care, and medical-surgical units	Supervisor positive-feedback training, provided by the researchers, with a written summary of what was discussed. Nurse supervisors were asked to give input about reasons for nurse burnout. They were presented with research suggesting a predictor for burnout is the absence of positive feedback. Examples of positive feedback were provided, and supervisors were encouraged to adjust supervision styles.	No significant pre-treatment differences between treatment and control groups were found. Emotional exhaustion scores of nurses in the treatment group changed significantly after the training: treatment=-1.29, control=1.90, $p<0.05$. No significant differences on other subscales were found: depersonalization (treatment=-0.18, control=0.72, $p>0.05$), personal accomplishment (treatment=-0.65, control=1.90, $p>0.05$), supervisor support (T=-0.53, C=-0.76, $p>0.05$) and peer cohesion (T=-0.38, C=-0.41, $p>0.05$)

Gray, 2016	Qualitative study. Empirical phenomenological study	UK	NHS trust	4 Participants	A 10-week coaching programme structured in three parts: introduction to propositional knowledge relating to workplace stress and to the salutogenic model (focusing on factors that improve human health and wellbeing), one to one coaching with participants using the salutogenic model and focusing on the salutogenic model as a team.	Personal resilience and wellbeing were perceived to be improved; significance was not assessed. This impacted workplace performance and affected resilience of wellbeing of others and supported participants during a time of organisational transition. Participants had the following change scores (1-7, 1=best, 7=periphery). 1: pre 7, post 2 2: pre 4, post 7 3: pre 5, post 3 4: pre 7, post 2
Guzman, 2016 &Guzman, 2017	Mixed-Method study. Quantitative wait-list controlled design. Qualitative: Focus groups with staff.	UK	45-bed residential care home and an 80-bed nursing care home	Nurses, care-assistants, kitchen staff, housekeeping, management, gardener, activity coordinators.	The Culture Change Studio Engagement Programme which uses interactive theatre and is based on positive psychology. It aims to enhance staff communication.	Home A (n=19): No significant difference between pre- and post-measurements. Home B (n=31): Significantly more positive interactions post-intervention, compared to pre-intervention chi-square: 43.28, p=0.001. No significant change on the Sense of Competence (SCIDS) total score: t (25)=-1.627, p=-0.116). No significant improvement of the Approaches to Dementia Questionnaire t (27)=-0.946, p=0.353. No significant change on the Job Satisfaction Inventory: t (8)=-1.512, p=-0.169. There was a negative significant change on the brief learning transfer system inventory t (27)= 9.07, p<0.001. No significant change on the SPANE total score of positive experience (t (27)=0.945, p=0.353) or negative experience (t(27)=0.271, p=0.788. Qualitative: 28 staff members participated in focus groups, 22 of whom had participated in the programme. Staff thought the training had improved their team working skills and they developed more positive attitudes towards residents. Some thought that once training had finished staff reverted to their previous roles with no further cross-departmental interaction and support. The training was described as fun and inclusive, but also as compromising as staff was nominated for participation by managers. Also, participation was intimidating as staff was anxious about having to do drama. Participants learnt to bring fun into their jobs. They discussed the need for a supportive meeting after the project had finished. Managers identified the need for clearer information about the training before setting up the training programme.

Hall, 2016	Qualitative study. Semi-structured individual interviews	UK	Autism care organisation	Speech and language therapist (n=1), college tutor (n=1), adult home deputy manager (n=1), teacher (n=1) and children's home manager (n=1), senior manager (n=2)	Video Interaction Guidance. A video is made of interaction between staff and client and moments of successful interaction are extracted. Positive feedback is then provided to staff member. During 2-day course trainee guiders were introduced to the principles and theoretical underpinnings. After this they worked under supervision of qualified trainers through three phases of training, each takes 6 months to complete.	All participants (n=7) were interviewed. Understanding of intervention was only realised after staff became fully involved. Focus on moments of success was different from historical culture and there was strong scepticism at the beginning. Staff members experienced increase in confidence after intervention and became enthusiastic advocates. Trainees struggled balancing carrying out VIG work and attending supervision sessions with day-to-day roles. They experienced lack of coordination between this intervention and another video intervention in the organisation. Increased confidence may lead to creative ideas, but uncertain if organisation is receptive to creative ideas. One participant felt ill-prepared and questioned sustainability of intervention.
James, 2012	Qualitative study		Autism care organisation	Staff working in educational services (n=3) and staff working in residential services (n=1)	Video Interaction Guidance. A video is made of interaction between staff and client and moments of successful interaction are extracted using an analysis framework that has four key elements of successful relational interaction. Clips are selected using contact principles and discussed. Positive feedback is then provided to staff member.	Three participants had and evaluated two films, one participant had and evaluated three films. All participants were positive. The intervention had impact on their feelings and work role. Video feedback was seen as stronger reinforcement compared to other forms of feedback. The intervention increased participant's awareness of their interactions. It helped participants observe analyse and interpret subtle communication.
James, 2016	Qualitative study	UK	Autism care organisation	Ten staff participants	Video Interaction Guidance. A video is made of interaction between staff and client and moments of successful interaction are extracted. Positive feedback is then provided to staff member.	Number of feedback sessions was contingent on a variety of factors (i.e., goal attainment, agreement service user etc.). Five participants were interviewed twice, before and after the intervention. The other five participants were interviewed three times: upon agreement to participate, 4-6 months later and after the intervention. Visual impact helped participants to take a step back from the intensity of their work. Service users were seen as a person just like themselves. Heightened awareness appeared to open more space for deeper understanding of the impact. New insight would be followed by changes in behaviours. They had an overall positive essence where creativity and confidence was evident.

Kavanagh, 2010	Mixed-method study. Quantitative: Qualitative:	Canada	Surgical unit in university affiliated paediatric hospital	24 nurses were interested and eligible, 12 (9 nurses and 3 nurse leaders) participated	AI in four three-hour sessions, held over two weeks, about pain management services. AI was held in hospital meeting rooms.	Majority (n=11) attended all sessions, one participant dropped out due to personal reasons. Leaders had the tendency to arrive late and leave early. No participant missed key elements. Participants liked the AI process as it was appealing in its atypicality. Participants were satisfied with the intervention. AI was considered clinically useful. Engagement in the sessions was described as rewarding, motivating, and empowering. They like the positive focus, but it didn't feel effortless. Acknowledging issues and challenges was considered important. Nurse participants appreciated being involved from the outset and the democratic nature of AI. Being leaders of change was relished. Participants liked the number, duration, and frequency of AI sessions. The group size was satisfactory as well. Nurse leaders mentioned it was difficult to free time up for participation. Facilitators contributed different perspectives, ideas and experience and prevented conflict.
Kielar, 2015	Retrospective interdepartmental quality initiative project.	Canada		Radiologists, residents, technologists, and clerks (n=NA).	Kudos congratulatory quality initiative program. In-service educational seminar s and email communications were provided before implementation. A standardised email template is used.	62 Kudos Quips have been received since inception in mid-2012. They included Kudos related to initial interpretations of radiographs, sonography, CT, and MRI. Two Kudos were sent to a technologist and booking clerk respectively for a job well done and above and beyond what was expected.
Knibbs, 2010	Mixed method study. Quantitative: Qualitative:	Canada	Public health settings all over Canada	Frontline public health nurses, policy makers and managers (n=156).	Focus groups using a semi-structured AI approach	The strength-based nature contributed to the development of policy solutions. These were well accepted in various federal and provincial policy forums. Research and decision-maker team members reported they were confident about the methodology used. 93% (n=136) indicated AI was helpful, 89% (n=131) would recommend the AI programme.
Macafee, 2012	Mixed method study. Quantitative: Qualitative:	UK	One training region in the UK	34 surgical trainees	Strengthoscope, an assessment tool that provides comprehensive measurement of individual strengths at work and feedback sessions.	Feedback was favourable in all trainees, the tool helped them identify strengths. For some trainees the intervention confirmed what they felt to be a true representation of themselves. External validation provided an important confidence boost. It led to increased sense of personal fulfilment and greater commitment to surgery.
Muha, 2010	Case study	USA	Department in major academic medical centre		PROPEL: passion, relationships, optimists, proactive, energy and legacy	Job engagement scores went for 3% to 87% as compared to other hospitals in the database. Staff satisfaction rose from 1% to 85% and retention improved 49%. Sick leave dropped by 75%. Patient satisfaction scores rose by 43%.
Palamara, 2015	Mixed Method study. Quantitative: Qualitative:			72 internal medicine interns and 26 coaches	A strength-based coaching model following the principles of positive psychology provided by members of the teaching faculty.	94% (45/48) rated the coaching programme as good or excellent; 96% (46/48) would recommend the programme. At the start of the year 44% scored high on emotional exhaustion compared to 33% at the end of the intern year, this was not significant. Personal accomplishment scores were unchanged.

Ruhe, 2014	Mixed method study	USA	30 primary care practices in northeast Ohio.		Two cycles of the AI process. The first cycle, consisting of four 2-hour practice meetings, is not preventive service delivery related, the second, consisting of fewer meetings, is preventive service delivery related.	The AI intervention process led to discussions among practice members about individual values and goals. By sharing personal stories each side came to appreciate the difficulty of the other's role and the importance of both perspectives in meeting the diverse needs or the patient population. By discussing and sharing what was important to all practice members a shared frustration with and desire to improve the current state of practice relationships was exposed. The new knowledge enabled practice change by identifying necessary approaches and objectives for intervention. A new understanding was often revealed by comments of affirmation or surprise during personal and group reflection activities.
Hussein, 2013 Sharma, 2015	Mixed method study. Quantitative: Longitudinal cohort study with control group. Qualitative:	India	Six secondary and tertiary hospitals in Gujarat.	5 superintendents/heads, 4 medical officers, 2 gynaecologists/other specialists, 10 staff nurses, 5 support staff and 5 pharmacists	AI: 1 day session for the discovery part and a 2-day workshop for the dream part. Teams to plan and monitor were formed. Regular staff meetings were introduced as well.	Incidence of puerperal infection during the pre-intervention period was 5.7%, ranging from 1%-17% in the different hospitals. Infection incidence reduced in both intervention and control groups. In control groups incidence halved from 7.4% to 3.5% and from 4.3% to 1.7% in intervention groups, which was significant ($p<0.0001$). Infection incidence was lower in control group (OR 0.60 95% CI 0.39-0.92). There was no difference in trend between control and intervention groups ($p=0.37$). Respondents perceived that practices improved after AI: Hospital 1 (AI) improved all practices, Hospital 2 (A) improved all practices except ensuring patient safety, Hospital 3 (AI) improved all except regularity in sterilising facilities, Hospital 4 (no AI) improved on staff compliance and regularity, not on others, Hospital 5 (no AI) improved only on ensuring patient safety and Hospital 6 (no AI) improved staff compliance and ensuring patient safety. AI reportedly had a positive influence on support staff in particular. Better work allocation and definition of responsibilities, enhance knowledge about causes of infection and the role of cleanliness, improved self-esteem, and the recognition of being part of a team which in turn motivated better performance.
Shendell-Falik, 2007	Quantitative study	USA	673-bed hospital, handoff from ED to inpatient telemetry unit.	Nurses from telemetry unit and ED	AI 5-D cycle: a five-hour session to identify topics, interviews among nurses and a 1.5 day session to review interviews and attend the dream, design and destiny phases.	Patient satisfaction scores: pre=79.1, post_t1=85.5, post_t2=87.2. Relative improvement=10.2% Nursing satisfaction: pre=84.5, post_t1=90.0, post_t2=92.1. Relative improvement= 9% ED rating: pre=61.7, post_t1=69.6, post_t2=76.1. Relative improvement=23.3% Nutritional assessment: pre=89, post_t1= 94.4, post_t2 = 98.8. Relative improvement = 11% Compliance with cardiac enzyme regimen: pre=87%, post_t2=95%. Relative improvement =9.2% Medication administration record compliance: pre =55%, post_t2=100%. Relative improvement= 81.8% Nurse satisfaction and teamwork: pre = 90-97.6%, post_t2=99.2%. Relative improvement = 2.4-9.3%

Siu, 2013	Quantitative study. One group pre-test post-test design	China	Public hospitals	1034 healthcare workers from different job levels.	Intensive 2-day training program (7 hr a day) about stress, self-healing techniques, emotion management, applying positive psychology, effective communication, and recovery, organised in 17 repeated classes with approximately 60 participants per class.	817 participants completed pre- and post-tests. Participants scored significantly lower on physical/psychological symptoms (pre: mean=2.96 SD 0.88, post: mean=2.73 SD 0.85, p<0.002) and burnout (pre: mean=2.90 SD=0.59, post: mean=2.74 SD=0.60 p<0.001) and significantly higher on job satisfaction (pre: mean=4.30 SD=0.93, post: mean=4.49 SD=0.88 p<0.001) and positive emotions (pre: mean=3.86 SD=0.75, post=4.10 SD=0.74, p<0.001)
Stefaniak, 2007	Quantitative study	USA	473-bed quaternary acute hospital	17 nursing leaders and 28 staff nurses	AI 4D cycle consisting of workshops and two AI summits	Decrease in vacancy rate from 6.2% to 4.1%. Turnover reduced from 10.35% to 8.42%. Increased nurse decision making scores 40.5-45.5. Manager satisfaction 115-110.
van Agteren, 2018		Australia	Major public healthcare provider	Clinical and non-clinical staff	Two days of resilience training, based on the TechWerks Resilience Training program, provided by experienced trainers.	Statistically significant improvements in wellbeing (P=0.001) and resilience (p=0.02). Effect sizes were small or moderate for overall samples. Those with low to median effect size demonstrated higher effects for wellbeing (d=0.67) compared to those with high baseline wellbeing scores (d=0.36). The same trend was visible for resilience scores: those with low baseline resilience scores demonstrated higher effect sizes (d=0.92) after the training than those with high baseline resilience scores (d=0.24).
Wright	Quantitative study	UK	National Paediatric Liver service	32 ward nursing staff	Appreciative interviews	Vacancy rates fell significantly in 2 wards, but not in the third. There was a trend to increase in leavers in two wards, but not in the third. Sickness absence rates in one ward showed a reduction during the project, but it rose again to previous levels on completion.
Yu, 2008	Quantitative study	Australia	Large teaching hospital	17 frontline nursing managers	Workplace coaching programme based on a positive approach to change, a period of explicit support to transfer learnings and skills to the workplace and personalization. The coaching programme consisted of the following: 16 90-mintue coaching seminars, 16 60-minute coaching groups, 6 45-minute coaching sessions per participant, group work	Significant changes were found for proactivity (taking charge: z=-2.8, p<0.05), individual innovation z=-2.7, p<0.0)), core performance (z=-2.7, p<0.05), self-insight subscale of meta-cognition (z=-2.2, p<0.05), motivation (role breadth self-efficacy -2.8, p<0.05), well-being (positive affect z=-2.0, p<0.05 and autonomy z=-2.0, p<0.05). No significant change was found on wellbeing (negative affect), environmental mastery, personal growth, purpose in life, personal relationships, and self-reflection.

APPENDIX 4 MECHANISMS IDENTIFIED IN SYSTEMATIC REVIEW

Mechanism	Study
Allowing time and space to offer opinions	Hall
Appreciation parties to keep momentum going	Muha
Awareness of positivity helps to alert us to possibilities to be proactive about wellbeing	Gray
Awareness of triggers makes staff proactive about creating conditions for team wellbeing	Gray
Breaking down interprofessional hierarchies and appreciation of interdependence	Dematteo, Sharma
Building relationships	Shendell-Falik
Catalysing discussion and information exchange	Sharma
Celebrating and valuing what works well	Dewar
Communication that creates an enjoyable shared experience	Guzman2
Consistent use of strengths	Muha
Creating a vision based on important values	Muha
Curiosity led to new and surprising knowledge	Dewar
Dedicated organisational resources	Dematteo
External validation	Macafee
Focus on creativity, mutual respect and relationship building	Dematteo, Stefaniak
Generative story and mutual understanding created	Bergs
Helping others be at their best	Muha
Identification of supportive organisational attributes	Knibbs
Improved coping resources to tackle burnout	Siu
Increased awareness due to participation in project	James 1, James2, Sharma

Interactions amongst participants	Austin
Leader participation	Muha
Modifications in personal and group thought processes and behaviour	Dematteo
More focused discussions	Sharma
New insights	James1
New understanding of personal or group character	Ruhe
Newfound understanding of strengths	Macafee
Noticing what works well leads to enhanced awareness of processes of skilled human interaction	Dewar
Orienting participants to best self	Gray
Peer advocacy through positive experience with intervention	Hall
Peer behaviour was facilitated, and a climate of mutual understanding and positive behaviour created	Bergs
Perceived supervisor and peer support	Eastburg
Picturing job and duties in new perspective	Ammentorp
Positive behaviour both in and away from the workplace	Austin
Positive frame of thought when focusing on challenges	Dematteo
Recognition of experts in own context and members of team	Hall, Sharma
Recognising and reframing negative interpretations	Ammentorp, Dematteo, Dewar, Knibbs, Stefaniak
Recognising valued conversations	Dewar
Regular visits of research team	Sharma
Restoration of hope and meaning	Dematteo
Seeing evidence of impact made in daily work	James2
Sense of community	Buck, Gray

Sharing experiences and history leads to a shared emotional connection and momentum for interprofes-sional activities	Buck, Dewar, Ruhe, Stefaniak
Sustaining success and satisfaction	Muha
Time to reflect	Ammentorp, Hall, James1, Stefaniak
Trust and communal obligation to end result created	Ammentorp
Trust was created by sharing feelings and ideas	Ruhe
Visual representation that helps to make sense of how staff feels at work	Gray
NONE	Bolier, Challis, Guzman1, Kavanagh, Kielar, Pala-mara, Hussein, van Agteren, Wright, Yu

APPENDIX 5 CONTEXTUAL FACTORS IDENTIFIED IN SYSTEMATIC REVIEW

Context	Direction	Study
Celebration and positivity not always comfortable	-	Dewar
History of failed organisational projects and focus on negative practice made participants sceptical	-	Dematteo, Guzman2, Hall
In some units robust workplace relationships are difficult to achieve (i.e. float pool)	-	Buck
Intervention viewed as management strategy for advancing corporate goals of organisation	-	Dematteo
Lack of managerial support	-	Guzman2
Lack of personal contact in intervention	-	Bolier
Stressful work environments	-	Dematteo, Guzman1, Hussein
Champion commitment	+	Ruhe, Shendell-Falik
Coach demonstrated authenticity, integrity, balance in life, commitment to learning, vulnerability, excellence, and sense of responsibility	+	Ammentorp
Democratic nature of intervention	+	Kavanagh
Enthusiastic coach/trainer	+	Guzman1
Initial understanding of intervention	+	Hall
Managerial support	+	Buck, Dewar, Guzman2, Kavanagh, Muha, Palamara, Ruhe, Stefaniak
No professional relationship between coach/trainer and participant	+	Ammentorp, Macafee, Palamara
Online interventions can be used at participant's convenience and are more affordable	+	Bolier, Macafee
Past successes	+	Ruhe
Positivity welcome contrast to problem-based approach	+	Dematteo, Kavanagh, James1
Regular meetings	+	Sharma
Regular reinforcement during training	+	Macafee
Shift from structure to agency in hospitals	+	Dematteo
Sufficient human resources	+	Kavanagh
Support for Change	+	Ruhe

Time between sessions based on participant's need	+	Ammentorp
Urgent practice need	+	Ruhe
NONE		Austin, Bergs, Challis, Eastburg, Gray, James2, Kielar, Knibbs, Siu, van Agteren, Wright, Yu

APPENDIX 6 PARTICIPANT INFORMATION LEAFLETS AND CONSENT FORMS

Participant Information Leaflet Community Health Worker Observations – English, translated into Chichewa by PIH-staff.

Study Title
The impact of the co-designed 'Learning from Excellence' intervention on Community Health Workers in Neno, Malawi.

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Introduction
You are invited to participate in a research study performed by the University of Warwick in the United Kingdom, together with Partners in Health. The study will focus on the Community Health Worker program, specifically supervision. Participation in the study is completely voluntary and you do not have to take part if you do not wish to do so. Refusing to participate will not reflect negatively on your job. Even if you agree to participate, you may stop at any time. If you agree to take part in this study you will need to sign a consent form.

Purpose
We will design and implement a supervision model for Community Health Workers. We will do so together with you and your colleagues so that your experiences are considered. We hope that through this study, the quality of supervision will improve and contribute to better job performance, job satisfaction, and motivation for the CHW team. This research contains multiple sub-studies. This sub-study will focus on the everyday context of community health workers and supervisors. This will help us with designing the intervention.

Procedure
If you decide to participate in this study the researcher, together with a translator, will observe your daily work over a period of approximately four hours and record your activities, ask questions about the work you do, and take photos of your work environment and the tools you use. The time and day for observation will be agreed upon in advance. We understand that observing you also means observing your patient. We will obtain permission from the patient separately and you may choose to exclude a specific patient from being observed if you think it is appropriate.

Benefits
Through participating in this study, you will contribute to improving supervision in the Community Health Worker program, including your own experience as a CHW or supervisor. Additionally you will

take part in the design of a new intervention to support supervision. Furthermore you will also generate knowledge on this subject that will benefit other Community Health Worker programs in Malawi and around the world.

Risks
You may find it strange to be shadowed by the researcher and translator or it may make your client uncomfortable. In such cases, you can speak to the study team about how to make the situation more appropriate for your interaction with the client. It is possible that in the process of observation, we may note that a Community Health Worker or Supervisor who is participating in the study behaves inappropriately towards a client or a colleague. If this does happen, the researcher is obligated to inform the Programme Office of Partners in Health.

Expenses and payments
You will be reimbursed for any travel expenses you incur as a result of participating in this study. If you are a Community Health Worker or a direct supervisor, you will be offered a small monetary gift.

Privacy & Confidentiality
Strict ethical and legal practice will be followed and all information that we collect about you will be handled in confidence. We will use your data in the ways needed to conduct and analyse the research study.

Collected data will include field notes, answers to informal questions and photos taken with a camera. The field notes and answers to the questions will be made electronically at the end of the day. You will be given a numerical code, and no identifiable information will be collected. After we take a photo we will check if there is anyone on the photo, if this is the case the photo will be deleted immediately and a new photo will be taken. All data will be saved on secure computer server in password protected files. As soon as electronic files have been safely backed-up any paper forms will be destroyed.

No identifiable information will be included in publications or presentations based on your data. The University of Warwick will keep identifiable information about you for 10 years after the study has finished. For further information, please refer to the University of Warwick Research Privacy Notice which is available here: https://warwick.ac.uk/services/idc/dataprotection/privacynotices/research-privacynotice or by contacting the Information and Data Compliance Team at GDPR@warwick.ac.uk.

Study approval
This study has been reviewed and given favourable opinion by the University of Warwick's Biomedical & Scientific Research Ethics Committee (BSREC) [BSREC 55/18-19] and the National Health Sciences Research Committee (NHSRC) in Lilongwe, Malawi.

Study Site
Dambe and Neno District Hospital catchment areas in Neno, Malawi.

Consent Form Observational Study – English, translated into Chichewa by PIH-Staff

Consent and Signature

1. I confirm that I have read and understand the information above. I have had the opportunity to think about the information and ask questions that have been answered.

   Yes [PROCEED] No [STOP]

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my job being affected.

   Yes [PROCEED] No [STOP]

3. I agree to take part in the above study.

   Yes [PROCEED] No [STOP]

4. I understand that data collected during the study, may be looked at by the research team named above, where it is relevant to my taking part in this study. I give permission for these individuals to have access to my data.

   Yes [PROCEED] No [STOP]

5. I consent to photographs that are being taken as part of this study.

   Yes [PROCEED] No [STOP]

_____ _____

Signature of person obtaining consent Date

_____

Printed name of person obtaining consent

_____

Participant's study ID

_____

Printed name of the participant

_____ _____

Participant signature, "X" mark or thumbprint to indicate consent Date

The research staff will keep this page of the consent form for records.
Thank you

Participant Information Leaflet Stakeholder Interviews Observational Study – English, translated into Chichewa by PIH-staff.

Study Title
The impact of the co-designed Learning from Excellence intervention on Community Health Workers in Neno, Malawi.

Name and Contacts of Principal Investigators
Maartje Kletter, Maartje.kletter@warwick.ac.uk
Emilia Connolly, econnolly@pih.org

NHSRC Contact Information	University of Warwick Contact Information
Mr. Collins Mitambo National Health Sciences Research Committee Ministry of Health PO Box 30377 Lilongwe 3, Malawi Email: [redacted] Tel: +265 999397913	Research & Impact Services University House University of Warwick Coventry, CV4 8UW Email: researchgovernance@warwick.ac.uk Tel: +44 (0)24 76 522746

Introduction
You are invited to participate in a research study performed by the University of Warwick in the United Kingdom, together with Partners in Health. The study will focus on the Community Health Worker program, specifically supervision. Participation in the study is completely voluntary and you do not have to take part if you do not wish to do so. Refusing to participate will not reflect negatively on your job. Even if you agree to participate, you may stop at any time. If you agree to take part in this study you will need to sign a consent form.

Purpose
We will design and implement a supervision model for Community Health workers. We will do so together with you and your colleagues so that your experiences are considered. We hope that through this study, the quality of supervision will improve and contribute to better job performance, job satisfaction, and motivation for the CHW team. This research contains multiple sub-studies. This sub-study will focus on the everyday context of community health workers and supervisors. This will help us with designing the intervention.

Procedure
If you decide to take part in this study you will be asked to participate in an individual interview. We may also ask you to participate in individual interview that will be conducted in a quiet room in a public place chosen by you. You will be given a choice of answering questions in English or in Chichewa through a translator. If you agree this interview will be recorded.

Benefits
Through participating in this study, you will contribute to improving supervision in the Community Health Worker program, including your own experience as a CHW or supervisor. Additionally you will take part in the design of a new intervention to support supervision. Furthermore you will also generate knowledge on this subject that will benefit other Community Health Worker programs in Malawi and around the world.
Risks

The possible risks or discomforts of the study are minimal although you may feel a little uncomfortable answering some (personal) questions.

Expenses and payments
You will be reimbursed for any travel expenses you incur as a result of participating in this study. If you are a Community Health Worker or a direct supervisor, you will be offered a small monetary gift.

Privacy & Confidentiality
As a publicly-funded organisation, the University of Warwick have to ensure that it is in the public interest when we use personally-identifiable information from people who have agreed to take part in research. This means that when you agree to take part in a research study, such as this, we will use your data in the ways needed to conduct and analyse the research study.

Strict ethical and legal practice will be followed and all information that we collect about you will be handled in confidence.

Collected data will include the (translated) and transcribed interviews. Once interviews are translated and transcribed they will be destroyed and identifiable information will be pseudonymised so that no names or places will be present in the text that will be used for analysis. In a password-protected electronic file, only accessible by the PI and supervisor, the codenames are connected to the original data.

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Study Site
Dambe and Neno District Hospital catchment areas in Neno, Malawi.

Consent Form Stakeholder Interviews Observational Study – Translated into Chichewa by PIH-Staff

Consent and Signature

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   Yes [PROCEED] No [STOP]

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my job being affected.

   Yes [PROCEED] No [STOP]

3. I agree to take part in the above study.

   Yes [PROCEED] No [STOP]

4. I understand that data collected during the study, may be looked at by the research team named above, where it is relevant to my taking part in this study. I give permission for these individuals to have access to my data.

   Yes [PROCEED] No [STOP]

5. I consent to audio-recordings of the interview.

   Yes [PROCEED] No [STOP]

_____ _____

Signature of person obtaining consent Date

_____

Printed name of person obtaining consent

_____

Participant's study ID

_____

Printed name of the participant

_____ _____

Participant signature, "X" mark or thumbprint to indicate consent Date

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Thank you

Participant Information Leaflet Questionnaires Mixed Method Evaluation – English, translated into Chichewa by PIH-staff.

Study Title
The impact of the co-designed Learning from Excellence intervention on Community Health Workers in Neno, Malawi.

Name and Contacts of Principal Investigators
Maartje Kletter, Maartje.kletter@warwick.ac.uk
Emilia Connolly, econnolly@pih.org

NHSRC Contact Information	University of Warwick Contact Information
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Purpose
We will design and implement a supervision model for Community Health workers. We will do so together with you and your colleagues so that your experiences are considered. We hope that through this study, the quality of supervision will improve and contribute to better job performance, job satisfaction, and motivation for the CHW team. This research contains multiple sub-studies. This sub-study will focus on outcomes of the intervention.

Procedure
If you decide to take part in this study you will be asked to complete a written questionnaire, which will be followed up by another questionnaire in approximately six months' time. It will take approximately 15 minutes to complete the questionnaire. You are free to leave any questions blank if you do not wish to answer them for any reason. We will collect your names as we would like to follow up this questionnaire with another one in six months' time.

Benefits
Through participating in this study, you will contribute to improving supervision in the Community Health Worker program, including your own experience as a CHW or supervisor. Your participation will help us to adapt the intervention to better suit your needs. Additionally, you will also generate knowledge on this subject that will benefit other Community Health Worker programs in Malawi and around the world.

Risks
The possible risks or discomforts of the study are minimal although you may feel a little uncomfortable answering some (personal) questions.

Expenses and payments
You will be reimbursed for any travel expenses you incur as a result of participating in this study. If you are a Community Health Worker or a direct supervisor, you will be offered a small monetary gift.

Privacy & Confidentiality
As a publicly-funded organisation, the University of Warwick have to ensure that it is in the public interest when we use personally-identifiable information from people who have agreed to take part in research. This means that when you agree to take part in a research study, such as this, we will use your data in the ways needed to conduct and analyse the research study.

Strict ethical and legal practice will be followed and all information that we collect about you will be handled in confidence.

Your answers will be collected on paper and added into a password-protected file on a password-protected computer. As soon as we add your data you will get a unique, unidentifiable code. Your name will not be added to your answers. As we will link the data of this questionnaire with the questionnaire that we will ask you to complete in approximately six months, we will have to save your name on a password protected file in which we link the name to the unique code. Only the PI and her supervisors will have access to this file. In this file we will link your name to a unique code. We will anonymize the paper questionnaires by removing your names, so that only the code will be present. We will save hard copies of the anonymized pre-intervention questionnaires in a locked cabinet. The hardcopies will be destroyed once data collection is completed. No identifiable information will be included in publications or presentations based on your data.

The University of Warwick will keep identifiable information about you for 10 years after the study has finished. For further information, please refer to the University of Warwick Research Privacy Notice which is available here: https://warwick.ac.uk/services/idc/dataprotection/privacynotices/research-privacynotice or by contacting the Information and Data Compliance Team at GDPR@warwick.ac.uk.

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Study Site
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Conesnt Form Questionnaires Mixed Method Evaluation – English, translated into Chichewa by PIH-staff.

Consent and Signature

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   Yes [PROCEED] No [STOP]

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   Yes [PROCEED] No [STOP]

3. I agree to take part in the above study.

   Yes [PROCEED] No [STOP]

4. I understand that data collected during the study, may be looked at by the research team named above, where it is relevant to my taking part in this study. I give permission for these individuals to have access to my data.

   Yes [PROCEED] No [STOP]

_____ _____

Signature of person obtaining consent *Date*

_____

Printed name of person obtaining consent

_____

Participant's study ID

_____

Printed name of the participant

_____ _____

Participant signature, "X" mark or thumbprint to indicate consent *Date*

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Thank you

Participant Information Leaflet Interviews Mixed Method Evaluation – English, translated into Chichewa by PIH-staff.

Study Title
The impact of the co-designed Learning from Excellence intervention on Community Health Workers.

Name and Contacts of Principal Investigators
Maartje Kletter, Maartje.kletter@warwick.ac.uk
Emilia Connolly, econnolly@pih.org

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Mr. Collins Mitambo National Health Sciences Research Committee Ministry of Health PO Box 30377 Lilongwe 3, Malawi Email: [redacted] Tel: +265 999397913	Research & Impact Services University House University of Warwick Coventry, CV4 8UW Email: researchgovernance@warwick.ac.uk Tel: +44 (0)24 76 522746

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Purpose
We will design and implement a supervision model for Community Health workers. We will do so together with you and your colleagues so that your experiences are considered. We hope that through this study, the quality of supervision will improve and contribute to better job performance, job satisfaction, and motivation for the CHW team. This research contains multiple sub-studies. This sub-study will is about what you think of the intervention.

Procedure
If you decide to take part in this study you will be asked to participate in an individual interview. We may also ask you to participate in individual interview that will be conducted in a quiet room in a public place chosen by you. You will be given a choice of answering questions in English or in Chichewa through a translator. If you agree this interview will be recorded.

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3. I agree to take part in the above study.

   Yes [PROCEED] No [STOP]

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   Yes [PROCEED] No [STOP]

5. I consent to audio-recordings of the interview.

   Yes [PROCEED] No [STOP]

_____ _____

Signature of person obtaining consent *Date*

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Printed name of person obtaining consent

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Participant's study ID

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Printed name of the participant

_____ _____

Participant signature, "X" mark or thumbprint to indicate consent *Date*

The research staff will keep this page of the consent form for records.

Thank you

APPENDIX 7 INTERVIEW GUIDE OBSERVATIONAL STUDY

1. What does the supervision process of community health workers look like?
2. What are strengths of the current supervision process?
3. What are possible weaknesses of the current supervision process?
4. What are your ideas about the current Medic Mobile app to date?
5. What are strengths of the Medic Mobile application?
6. What are weaknesses of the Medic Mobile application?
7. What do you think of a 'Learning from Excellence' intervention for community health workers and their supervisors?
8. What could be strengths of the 'Learning from Excellence' intervention for community health workers and their supervisor?
9. What could be weaknesses of a 'Learning from Excellence' intervention for community health workers and their supervisors?
10. What could be the impact on the process of supervision of a 'Learning from Excellence' intervention?
11. What could be the impact for supervisors of a 'Learning from Excellence' intervention?
12. What could be the impact for community health workers of a 'Learning from Excellence' intervention?
13. How can this impact be achieved?
14. What contextual factors would play a role in achieving this impact?
15. What do you think of the theory explaining how a 'Learning from Excellence' intervention can impact the supervision process?
16. How can this theory be adapted to fit this setting?

APPENDIX 8 LFE IN THE UK, AS USED TO START CO-DESIGN PROCESS

WHY WAS THIS PARTICULAR THING EXCELLENT? HOW COULD WE DO IT MORE AS A DEPARTMENT?

WHAT IS YOUR NAME?

UNIVERSITY HOSPITALS BIRMINGHAM

Learning from Excellence at UHB

At UHB we are always seeking to improve the care we give to our patients. Patient safety is part of this and the traditional approach to safety focuses on investigating adverse events or near misses, so we can learn from them and put systems in place to prevent re-occurrence.

Recently a new concept in safety has been proposed. This involves looking at events which go right. We know that there is a lot that goes well in our organisation and we want to recognise and appreciate this good work. We believe we can learn from investigating these episodes of excellence and that this will help us to improve patient care and to build our organisational resilience.

We have developed the reporting form to help us capture episodes of excellence. Excellent events could be as complex as a good outcome for a complicated patient in a challenging situation, a member of staff who goes above and beyond what is expected of them or an episode of exceptional team working. Please report anything you think worthy of recognition and appreciation, and that we might be able to learn from. Further information about the initiative is available in the frequently asked questions.

- Frequently asked questions

We look forward to receiving your reports of excellence using the form below.

Learning from Excellence form

1. Your name *
2. Your email address *
3. Who achieved excellence?
4. What team or department are they part of? *
5. What did they do that was excellent? *
6. What went well as a result?
7. What can we learn?
8. Is there anything we could do differently or change as a result of this?

Submit

BIRMINGHAM WOMEN'S HOSPITAL

Submission Form

Date of excellent event	08/10/2018
Who achieved excellence?	Search and choose a name from the address book Please use text box below if you can't find the person who achieved excellence within the address book above or you want to nominate more than one person or team Name of person/s or team/s:
Department Excellence achieved in	
What occurred that was excellent?	
What factors do you think contributed to this excellence?	

Submit

© Birmingham Women's NHS Foundation Trust 2016

Where did it all go so right?

Learning from excellence for quality improvement

MILTON KEYNES UNIVERSITY HOSPITAL

★ New Report

Is this person within the hospital? YES NO

What did they do that was excellent?

What do you think the hospital could learn from this example?

Your name.

Your department.

Please select your role...

Your NHS email address.

EAST MIDLANDS EMERGENCY MEDICINE

Who has achieved Excellence? *
(e.g. individual or team)

Their Email Address
(if known)

What did they do that was Excellent? *
(please do not include any patient identifiable information)

Your Name
(optional)

First Name Last Name

Your Department
(optional)

BIRMINGHAM CHILDREN'S HOSPITAL

Learning From Excellence

Datix

APPENDIX 9 LFE FORM THROUGHOUT CO-DESIGN PROCESS

Initial form

Your name:

Are you:

- ☐ CHW
- ☐ SCHW
- ☐ SS
- ☐ X
- ☐ Other, please specify

Name of person who achieved excellence:

What catchment area do they work in?

- ☐ Site F
- ☐ Site G

What did the person do that was excellent?

Form after Co-Design activities in October 2019

Your name:

Are you:

- ☐ CHW
- ☐ SCHW
- ☐ SS
- ☐ X
- ☐ Other, please specify

Name of person who achieved excellence:

What catchment area do they work in?

- ☐ Site F
- ☐ Site G

What did the person do that was excellent?

- ☐ Identified a patient
- ☐ Did a great job in screening (*for?)*
- ☐ Escorts patients to the health facility.
- ☐ Follows up on patients after discharge.
- ☐ Other, please specify

Form after online feedback in November 2020

Your name:

Are you:

- ☐ Community Health Worker
- ☐ Senior Community Health Worker
- ☐ Site Supervisor
- ☐ Health Facility Staff
- ☐ Clinical Staff
- ☐ Leadership
- ☐ Other, please specify

Name of person who achieved excellence:

What catchment area do they work in?

- ☐ Site A
- ☐ Site B
- ☐ Site C
- ☐ Site D
- ☐ Site E
- ☐ Site F
- ☐ Site G
- ☐ Site H
- ☐ Site I
- ☐ Site J
- ☐ Site K
- ☐ Site L
- ☐ Site M
- ☐ Site N

What did the person do that was excellent?

- ☐ Identified a patient
- ☐ Did a great job in screening (*for?)*
- ☐ Escorts patients to the health facility.
- ☐ Follows up on patients after discharge.
- ☐ Psychosocial support for client during hospital visit
- ☐ Psychosocial support for client after discharge
- ☐ Timely referral of case
- ☐ Other, please specify

Form after Co-design activities in January 2020

Your Name	

Are you	
	Community Health Worker
	Leadership
	Senior Community Health Worker
	Site Supervisor
	Health Facility Staff
	Clinical Staff
	Other, please specify:

Name of person who achieved excellence	

What catchment area do they work in			
	Site A		Site H
	Site B		Site I
	Site C		Site J
	Site D		Site K
	Site E		Site L
	Site F		Site M
	Site G		Site N

What did they do that was excellent?	
	Advocated well on behalf of the client
	Counselled a client on treatment adherence
	Made a timely referral
	Performed three post-natal care visits
	Provided psychosocial support to client during admission and/or hospital stay
	Referred a vulnerable household to POSER/other relevant services
	Regularly refer suspected malnutrition cases
	Submit client's sputum on a regular basis
	Supported a client to attend family planning services
	Supported a defaulting patient to go back into care
	Supported a pregnant woman to go for an antenatal care visit in the first trimester
	Other, please specify:

Why was this excellent

APPENDIX 10 STATA DO-FILE

Descriptive statistics and analysis Site G

```
import excel "\\wimple.ads.warwick.ac.uk\User52\u\u1591976\Documents\Thesis\Mixed Method\Quantitative\Outcomes Quant\Stata workbook.xlsx", sheet("Sheet1") firstrow

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recode newq2a .=2 if q2a==4

recode newq2a .=3 if q2a==3

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gen newq2b = 1 if q2b==5

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recode newq8a .= 2 if q8a==4

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gen newq8b = 1 if q8b==5

recode newq8b .= 2 if q8b==4

recode newq8b .= 3 if q8b==3

recode newq8b .= 4 if q8b==2

recode newq8b .= 5 if q8b==1

* q….a refers to responses pre LfE and q….b to responses post LfE

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tabstat q1b newq2b q3b q4b q5b q6b q7b newq8b q9b q10b, statistics( median p25 p75 count)

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by Site: tabstat q1a newq2a q3a q4a q5a q6a q7a newq8a q9a q10a, statistics( median p25 p75 count)

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gen total_before = q1a+newq2a+q3a+q4a+q5a+q6a+q7a+newq8a+q9a+q10a
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gen total_after = q1b+newq2b+q3b+q4b+q5b+q6b+q7b+newq8b+q9b+q10b
by Site: tabstat total_before, statistics (median p25 p75 count)
tabstat total_before, statistics (median p25 p75 count)
by Site: tabstat total_after, statistics (median p25 p75 count)
tabstat total_after, statistics (median p25 p75 count)
alpha q1a newq2a q3a q4a q5a q6a q7a newq8a q9a q10a, asis item
alpha q1a q3a q4a q5a q6a q7a q9a q10a, asis item
alpha q1b newq2b q3b q4b q5b q6b q7b newq8b q9b q10b, asis item
alpha q1b q3b q4b q5b q6b q7b q9b q10b, asis item
spearman q1a newq2a q3a q4a q5a q6a q7a newq8a q9a q10a
spearman q1b newq2b q3b q4b q5b q6b q7b newq8b q9b q10b
gen change1=q1b-q1a
gen change2=q2b-q2a
gen change3=q3b-q3a
gen change4=q4b-q4a
gen change5=q5b-q5a
gen change6=q6b-q6a
gen change7=q7b-q7a
gen change8=q8b-q8a
gen change9=q9b-q9a
gen change10=q10b-q10a
sort Site
by Site: tabstat change*, statistics (median p25 p75 count)
gen mota= q1a+q3a+q4a+q5a+q7a
gen motb=q1b+q3b+q4b+q5b+q7b
gen supa=q6a+q9a+q10a
gen supb=q6b+q9b+q10b
gen change_mot=change1+change3+change4+change5+change7
gen change_sup=change6+change9+change10
by Site: tabstat mot*, statistics (median p25 p75 count)
by Site: tabstat sup*, statistics (median p25 p75 count)
```

```
by Site: tabstat change_mot, statistics (median p25 p75 count)
by Site: tabstat change_sup, statistics (median p25 p75 count)
by Site: signrank mota=motb
by Site: signrank supa=supb
```

Analysis Site F

```
import excel "\\wimple.ads.warwick.ac.uk\User52\u\u1591976\Documents\Thesis\Mixed Method\Quantitative\Outcomes Quant\Stata workbook_Neno.xlsx", sheet("Sheet1") firstrow
gen Q2new = 1 if Q2==5
recode Q2new .=2 if Q2==4
recode Q2new .=3 if Q2==3
recode Q2new .=4 if Q2==2
recode Q2new .=5 if Q2==1
gen Q8new = 1 if Q8==5
recode Q8new .= 2 if Q8==4
recode Q8new .= 3 if Q8==3
recode Q8new .= 4 if Q8==4
recode Q8new .= 5 if Q8==1
gen mot= Q1+Q3+Q4+Q5+Q7
gen sup=Q6+Q9+Q10
ranksum mot, by(Time)
ranksum sup, by(Time)
sort Time
by Time: tabstat mot, statistics (median p25 p75 count)
by Time: tabstat sup, statistics (median p25 p75 count)
```

APPENDIX 11 INTERVIEW GUIDE MIXED METHOD EVALUATION

1. Can you tell me about the Learning from Excellence intervention?
2. What do you think of the Learning from Excellence intervention?
3. What do you like about the Learning from Excellence intervention?
4. What would you change (if anything) of the Learning from Excellence intervention?
5. What are challenges of the Learning from Excellence intervention?
6. What would you like to change going forward?
7. What do you think should stay going forward?
8. What recommendations for improvement do you have?
9. What did you think of the implementation process of the 'Learning from Excellence' intervention?
10. Did you fill in an excellence report and if so, why and if not, why not?
11. How did filing an excellence report make you feel?
12. What did you think of the form?
13. How could the form be improved?
14. What were barriers to filing an excellent report?
15. What were facilitators for filing an excellent report?
16. What were strengths/facilitators of the implementation process of the Learning from Excellence intervention?
17. What were weaknesses/barriers of the implementation process of the Learning from Excellence intervention?
18. What was the impact of the Learning from Excellence intervention for CHWs?
19. How (i.e. identify factors) do you think impact of the Learning from Excellence intervention was achieved?
20. What were facilitators to achieving the impact of the Learning from Excellence intervention for CHWs?
21. What were barriers to achieving impact of the Learning from Excellence intervention for CHWs?