The Role of Community Drug Distributors In The Fight Against Lymphatic Filariasis: A Mixed-Methods Study in Coastal Kenya

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Abbreviations

ALB: Albendazole

aOR: Adjusted odds ratio

APOC: African Program for Onchocerciasis Control

CHEW: Community health extension worker

CDD: Community drug distributor

CDI: Community-directed interventions

CI: Confidence interval

Coeff: Coefficient

DEC: Diethylcarbamazine citrate

GAELF: Global Alliance to Eliminate Lymphatic filariasis

GPELF: Global Program to Eliminate Lymphatic filariasis

HIV: Human Immunodeficiency Virus

IQR: Interquartile range

Ksh: Kenyan shillings

LF: Lymphatic filariasis

MDA Mass Drug Administration

NTD: Neglected tropical diseases

NGO: Nongovernmental organization

OR: Odds ratio

ODI: Overseas Development Institute

PQoL: Professional quality of life

SD: Standard deviation

STS: Secondary traumatic stress

WHA: World Health Assembly

WHO: World Health Organization

Acknowledgements

Summary

The Declaration of Alma Ata in 1978 defined community health workers as one of the important providers of primary healthcare. Following the Declaration, two critical agendas emerged for community health programs. The first focused on the provision of preventive and curative services within the existing health system, and the second focused on the engagement of communities in the process of taking responsibility for their health. Between the 1980s and 1990s, several post-colonial African countries adopted the community-based approach for delivering primary healthcare to individuals. However, several community-based health programs experienced challenges around training, remuneration and incentives, supervision, integration within the health system, drug supply and storage, and the biased selection and training of individuals who lacked motivation.

With the adoption of the Resolution by the World Health Assembly (WHA) in 1997 calling for the elimination of lymphatic filariasis (LF) as a public health problem, and the availability of free medicines, namely albendazole (ALB) and ivermectin in countries co-endemic for onchocerciasis and diethylcarbamazine citrate (DEC) and ALB are used for treatment in countries not co-endemic for onchocerciasis to facilitate elimination, there was a need for a cost-effective and efficient approach for delivering treatment to at-risk groups. Following commissioned studies to identify and implement a delivery strategy, the World Health Organization (WHO) adopted the community-directed treatment approach for the mass delivery of medicines for the elimination of LF. This approach included the distribution of medicines by community-selected volunteers or community drug distributors (CDDs) that were often health volunteers for other health programs or did not have any experience with being a volunteer. In Africa, volunteers receive material incentives, remuneration, training, supervision, drugs and social mobilization materials. However, research over the past decade has revealed that low motivation and performance among volunteers, as a result of various program and community level factors, negatively impact coverage and compliance. As a result, countries have to repeat mass drug administration (MDA) for a minimum of 5-6 years until the transmission of LF is interrupted.

Kenya adopted the community-directed treatment approach in 2002; however, the national neglected tropical diseases (NTD) program experienced challenges with implementation due to financial constraints and limited capacity. This resulted in

fragmented MDA, and low coverage and compliance, delaying the achievement of elimination goals. Despite efforts in 2016 to renew its commitment to achieving global and national targets, community volunteers' poor motivation and low retention and performance were identified as significant predictors of coverage and compliance. The following stakeholder groups and their unique challenges play a role in the ineffective engagement of volunteers during MDA:

- National program: Poor leadership, financial constraints, and limited capacity impede the program from effectively meeting the needs of volunteers.
- County program and health facilities: Limited supportive supervision of volunteers and resources, low drug supply, inadequate training, lack of positive engagement of communities before MDA, and high workload for volunteers affect compliance and coverage.
- Community level: The lack of involvement of communities in the selection of volunteers, low community knowledge of LF and MDA, and community distrust of the government lead to resistance towards volunteers.

This dissertation critically examines the role and engagement of CDDs in the fight against LF in Kenya, as well as the role of globalization in shaping the engagement between CDDs and the NTD program. Using the professional quality of life (PQoL) framework and the socio-ecological model, we sought to extract information from all levels of the health system in Kenya in order to better understand the contribution of CDDs, their challenges, and areas in which interventions are needed. First, we used qualitative methodology to examine perceptions of CDDs from the perspectives of their supervisors, community leaders, community members, and program officials. Secondly, we used the PQoL measures and employed a mixed methods approach to quantify the relationship between the measures and CDD performance and retention. In order to triangulate these findings, we conducted in-depth interviews with CDDs. Lastly, we used the healthy policy triangle framework to conduct a retrospective policy analysis to asses the interactions between context, actors, process, and content in the adoption of the community-directed treatment approach for the delivery of mass treatment to those at-risk for LF. Given the challenges with getting in touch with the original policy makers and the availability of detailed reports at the global and national levels, a document review was determined to be the most appropriate method.

From the qualitative study, the findings indicated that communities do not trust CDDs; and as a result, they resist CDDs. Furthermore, CDDs desire additional material and financial incentives, supportive supervision, and resources to effectively do their jobs. Also, CDDs do not always directly observe drug ingestion; they are biased in their selection of households for the delivery of drugs; and ineffectively conduct social mobilization during MDA. In addition, low community knowledge of LF and MDA, poor timing of MDA campaigns, and poor communication between CDDs and communities affect MDA targets. The NTD program acknowledged that financial constraints impede their ability to effectively motivate and engage CDDs and communities. Next, the mixed-methods study focused on the on-the-job quality of life (also known as PQoL) of CDDs revealed that higher household income and lower burnout scores were positively associated with their performance. Also, CDDs perform well when they have higher income and low secondary traumatic stress; and burnout negatively affects the retention of CDDs. In-depth interviews with CDDs revealed that various work conditions negatively affect their performance, motivation and MDA targets. These challenges include emotional and physical exhaustion from distributing medicines, verbal and physical abuse from community members, out of pocket expenditure on things related to MDA, high workload and limited time, and inadequate incentives. Third, the health policy analysis showed that the need to deliver donated medicines to endemic communities-using cost-effective and feasible approaches without burdening the local health system-was the catalyst for the commission of a multi-country study to determine the effectiveness, efficiency, and sustainability of the community-directed treatment approach. However, after the approach was adopted and shared with national programs to implement, countries like Kenya lacked the financial and human resources required to fully implement, monitor, evaluate, and scale-up the approach as required. This resulted in low community acceptance of MDA and medicines, affecting the target date to eliminate LF as a public health problem.

This dissertation project revealed the need for additional research on the contribution of CDDs, the opportunity costs they incur during MDA and the sustainability of the community-directed treatment approach. Using evidence from this project, it is critical to identify and test specific indicators that are needed to support CDDs as they deliver medicines to at-risk groups. In addition, new and innovative approaches are needed to integrate MDA and CDDs into the health system, and properly recognize

the critical contribution of CDDs in reaching public health goals such as LF elimination. In order to achieve its elimination targets, the NTD program in Kenya will require resources and scientific evidence to implement changes at all levels of the health system. This dissertation not only provides evidence that can inform the development and implementation of interventions, but also recommendations for improving MDA.

In delivering medicines to at-risk groups, evidence-based strategies at all levels of the health system are needed. At the global and national levels, an evidence-based review and adaptation of the community-directed treatment strategy and CDD stipends is needed to ensure that it reflects the current and changing needs of Kenyans. Secondly, national NTD staff can benefit from capacity building around advocacy, resource mobilization, effective cascade training, equity, gender, and human rights in NTDs, evidence-based decision-making, program monitoring and evaluation, integration of public health programs into the country health system, human resource management, and effective and efficient planning of MDA. In addition, the national NTD staff can collaborate with other disease programs (e.g. Malaria, Polio) to share resources and integrate activities where possible. At the global level, partners in NTDs and other disease programs can foster stronger collaborations, and share limited resources to achieve maximum impact and efficiency. Given that MDA is implemented through counties in Kenya, greater accountability and transparency among health leaders may foster trust between communities and the NTD program. Furthermore, county and sub-county health teams can also benefit from capacity building around community engagement, supply-chain and logistics, MDA supervision, and rapid responses to real-time MDA challenges. Post-MDA review meetings should provide county and sub-county health teams the opportunity to request for additional funds and resources to improve the next MDA. Healthcare workers can benefit from additional resources and trainings in order to better supervise and support CDDs during MDA activities. Next, CDDs should receive adequate training on social mobilization, reporting, managing severe adverse effects, coping with stressful MDA events, supportive supervision, incentives, resources, and time to effectively engage communities. The selection of CDDs by communities is critical, even when there might be shortages and CDDs have to distribute to unfamiliar communities. Finally, in order to reduce burnout and traumatic stress among CDDs, extra days for mop-up, distribution, and social

mobilization may be needed, as well as informal supervision of communities by their leaders.

Chapter 1: Introduction

Chapter 1.1: LF burden

Neglected Tropical Diseases thrive in poor communities and hard to reach areas throughout Africa and beyond. LF is one of five NTDs whose transmission cycle can be interrupted through annual large-scale distribution or MDA of preventive chemotherapy for at least five years to endemic communities [1, 2]. Preventive chemotherapy is delivered to communities by national NTD programs with support from international nongovernmental organizations (NGOs) [1, 2]. Treatment in countries co-endemic for onchocerciasis is based on a combined dose of ALB (400mg) donated by GlaxoSmithKline and ivermectin (150-200 mcg/kg), donated by Merck & Company Incorporated/MSD [1]. In countries not co-endemic for onchocerciasis, DEC, donated by Eisai (6mg/kg) and ALB are used for treatment [1]. These medicines are effective in killing microfilariae and thus help prevent the spread of microfilaria to mosquitoes. Albendazole reduces female egg production, causing temporary infertility. Multiple rounds of MDA can reduce infections in communities to levels below the threshold at which mosquitoes are able to efficiently spread the parasites from person to person, and thus interrupts transmission.

Lymphatic filariasis manifests in humans in several different ways, including hidden damage to the lymphatic and renal systems; and acute inflammation of the limbs or scrotum that are related to bacterial or fungal secondary infection of tissues with compromised lymphatic function. The damage to the lymphatic systems often leads to the abnormal enlargement of body parts (e.g. lymphedema and hydrocele), causing pain, severe disability, and social stigma. Morbidity and disability from LF prevents many patients from providing for their families and contributing to the economic development of their communities, and generates a significant health care burden [3]. At the household level, this results in generations becoming trapped in a cycle of increased medical costs, poverty, and disease. Approximately 25 million men have genital disease (hydrocele) and almost 15 million men and women have lymphedema or elephantiasis of the leg [4]. In endemic countries, LF has a major social and economic impact, and reduces the ability of the infected to perform basic daily activities and work [2, 4]. The healthcare needed for patients affected by LF

often places a burden on families [5]. In addition, stigma from hydrocele and lymphedema lead to abandonment by spouses and communities [6].

Chapter 1.2: NTDs, poverty, globalization, and the Sustainable Development Goals
The sustainable development goals (SDG) (Figure 1) provide the framework for ending poverty, protecting the planet, and ensuring that all people enjoy peace and prosperity by 2030 [7]. As part of the SDGs, countries have declared ending the epidemic of NTDs by 2030 [7]. They have also committed to achieving the SDGs in an integrated way where action in one area will affect outcomes and sustainability in others [7]. The SDGs that are most relevant for an integrated response towards the elimination and control of NTDs include SDG3, aligned with universal health coverage and health equity, focuses on increasing access to health services [3]. The first SDG supports ending poverty in all forms and dimensions by 2030 and targets those that are most vulnerable in our society [3]. In addition, MDA, morbidity management and disability prevention and integrated water, sanitation, and hygiene activities (SDG6) are made possible through effective global partnerships (SDG17) [3]. These activities can also have an impact on poverty (SDG1), hunger (SDG2), education (SDG4), and work and economic growth (SDG8), thereby reducing inequalities (SDG10) [3]. The role of primarily women as CDDs and CHWs support women's empowerment (SDG5), logistics and supply chain (SDG9) and non-discrimination against disability (SDG16) [3]. Epidemiologic, clinical, and programmatic interventions such as bed nets distribution to curb LF support the goals of urban sustainability, resilience to climate change, and sustainable ecosystems (SDGs 11, 13, 15) [3].

Figure 1: Sustainable Development Goals
Source: United Nations

Neglected tropical diseases proliferate in low-income countries where there is limited access to basic healthcare services, water, sanitation, housing, education, transport, and information [3]. In addition, these diseases thrive and spread rapidly in various social, environmental, climate, and economic contexts, including geographic areas that are experiencing rapid urbanization and growth in population [8]. In most settings, globalization has given rise to industrialized centers, urban areas, and flows of investment, people, and information, and created interdependence of economies and cultures [8]. It has also resulted in the movement of people from rural to urban areas in search for new job social and economic opportunities [8]. However, the rise of urban areas, as a result of globalization, poses risks and challenges for the transmission and elimination and control of NTDs [8]. For example, poor housing, mosquitoes' adaptation to urban environments from rural settings, and lack of effective fuel and ventilation systems can cause vectors to spread in a more rapid manner and be a greater burden to the health system [8]. This is coupled with limited water, sanitation, and waste management interventions in urban areas [8]. Rural areas also have challenges that lead to the proliferation of NTDs, including the inaccessibility of remote and hard-to-reach areas to deliver NTD interventions, low access to health facilities, low socio-economic status, women's disempowerment, and limited access to water, sanitation, and hygiene interventions [8]. Rural communities also experience rapid demographic, work, and cultural shifts as a result of globalization, which has implications for the effective delivery of NTD interventions [3].

Chapter 1.3: Globalization and its impact on Africa
Various scholars pose different definitions for globalization; however, there is a consensus that globalization results in interdependence and interrelation where people exchange ideas, language, information, and markets. Obinyam and Onobhayedo (2017) posit that globalization brings people together irrespective of the several miles or space or differences in race, color or tongue, separating its continents [9]. By this, the world shares one economic structure and cultural and social virtues [10]. Dukor (2008) further suggests "globalization is a process by which the network of cultural, political, and economic advantages and interest of the different peoples of the world collide naturalistically for mutual benefits" [10]. Figures 2 and 3 show the macro and micro levels of current knowledge on possible pathways and mechanisms, and illustrates the policies associated with "neoliberalism" that

have advanced a globalized economic system, changing labor markets, and working conditions in advanced industrialized countries with subsequent increases in exposure to stressful work [10].

Despite the fact that globalization has led to liberal markets by increasing trade and removing barriers that limit the flow of goods, some scholars view globalization as the force of political and economic neocolonialism, as well as the pathway through which dominant powers impose acculturation and enculturation [9]. This thought of globalization as neo-colonialism presents globalization as a paradox where the imposition of practices, values, and cultures negate the concept that we are all in one global village and one civilization, and would not profit at the expense of younger and smaller economies in Africa [9]. For less dominant economies in places in sub-Sahara Africa, the effects of globalization are not always advantageous. Bassey and Odoudome (2019) share that good business practices are followed in developed countries; however, market forces and consumer pressures lead to the need to cut costs, find new suppliers, and change markets. Thus, developing countries may accept trading practices and work conditions that would not be acceptable in other developed nations [11]. As a result, the social structure of developing countries shifts from rural to urban, and concentration of people where globalization is happening [11]. In addition, communal life and the role of extended family members evolve, changing the way people care for families and poor, orphaned, and widowed neighbors' care for members of the family [9].

Chapter 1.4: Anchoring preventive chemotherapy coverage in the right to health

In the early 2000s, the availability of free medicines for the elimination of LF led to the belief that all people from all communities would accept and have equitable access to them. However, this was not the case as many national programs failed to reach effective coverage [21]. A range of social, cultural, and economic factors affect preventive chemotherapy coverage, which impacts the good intentions of the distribution of medicine at no-charge [12]. In noting the tremendous progress made in NTDs and committing to build on efforts to treat and prevent NTDs, there was a need for renewed commitment to accelerate elimination and control of NTDs. On 12th December 2012, drug companies, donors, country programs, academic institutions, and NGOs signed the London Declaration on NTDs, committing to the control, elimination or eradication of diseases like LF by 2020, and improve the lives of over a

billion people [13]. During this period, the United Nations held its 67th United Nations General Assembly session on 12th December 2012 adopted a resolution that urged governments to see health as essential for sustainable development; and to strive for universal health coverage where at least 80% of the population can access quality health care services they need without suffering financial hardship [14]. Recently, universal health coverage and the SDGs have gained momentum, inciting action among nation states. The universal health coverage target of 80% is co-incidentally consistent with coverage targets for the elimination of LF (65% epidemiologic coverage each year for 5 years). Furthermore, the use of the United Nations human rights-based approach emphasizes non-discrimination, participation, and accountability for all countries [12]. Non-discrimination means that all services reach the marginalized, regardless of their social, economic, and cultural status. Participation means that at-risk groups have equal opportunities to benefit from all phases of the health program, including the effective, sustainable, and efficient engagement of CDDs. Finally, accountability ensures that the right to health is realized and monitored through accountability mechanisms, so long as they are accessible, transparent and, effective [12].
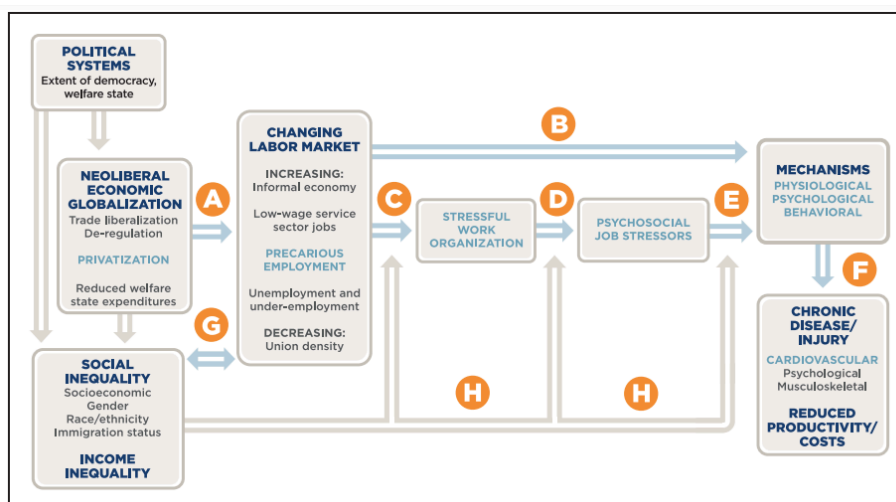
Figure 2. Macro model of globalization, the changing nature of work and health. Evidence for variables highlighted in light blue provided in this article. Proposed pathways have been lettered A-H. Adapted from: Landsbergis P, et al. Occupational Health Psychology (pp. 1086–1130). In Anna D (ed.) The Occupational Environment (3rd ed.). American Industrial Hygiene Association, 2011
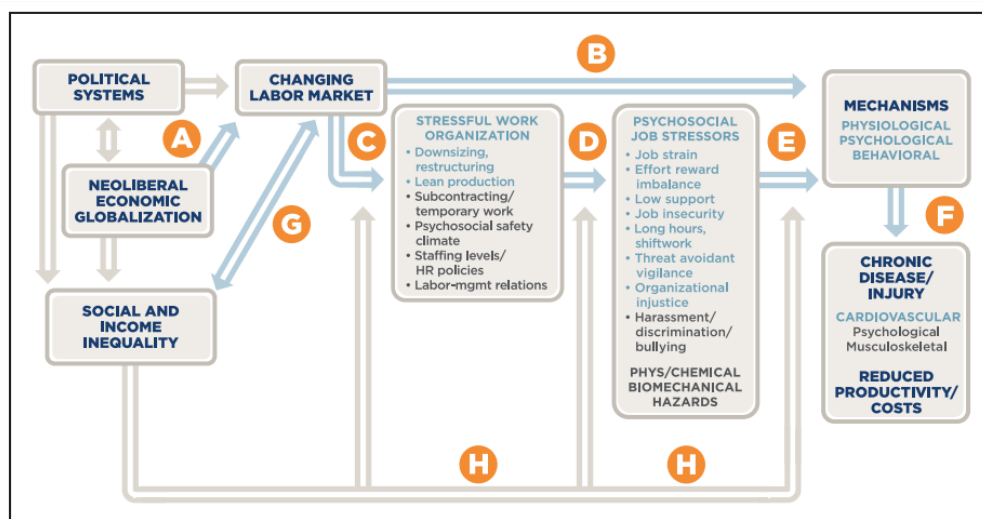
Figure 3. Micro model of globalization, the changing nature of work and health. Evidence for variables highlighted in light blue provided in this article. Proposed pathways have been lettered A-H. Adapted from: Landsbergis P, et al. Occupational Health Psychology (pp. 1086–1130). In Anna D (ed.) The Occupational Environment (3rd ed.). American Industrial Hygiene Association, 2011.

Chapter 2: The promise, perils, and purpose of the community-directed treatment strategy in NTDs

Chapter 2.1: The history of community drug distributors in NTDs

In 1997, the African Program for Onchocerciasis Control (APOC) faced the challenge of delivering preventive chemotherapy treatment to at-risk groups. The platform for delivery had to be cost-effective, able to reach those in remote and conflict zones, and sustainable. It was proposed that community-directed treatment where communities would manage their own MDA of medicines was the solution. This solution resulted in significant increases in preventive chemotherapy treatment coverage [15]. Given the record of success of community-directed treatment with APOC and the urgent need to scale up delivery strategies for other diseases, a multi-country study was launched to determine whether an expanded strategy of community-directed interventions could be used to address diseases like LF [16]. The findings from the study indicated that areas with experience in using community-directed treatment for onchocerciasis control could successfully deliver medicines for other diseases [16].

In community-directed treatment, CDDs are responsible for organizing social mobilization and health education activities to sensitize at-risk groups, conducting census activities, and delivering drugs [17]. This delivery strategy also means that volunteers would work without external monetary incentives; receive training and supportive supervision from health facility staff or health extension workers; maintain treatment records; assess treatment performance; and manage minor adverse events [18]. Community drug distributors are critical for the success of NTD programs and the achievement of current global targets for the elimination of diseases like LF and onchocerciasis. However they could also be a weak link [19, 20]. In addition, community ownership of the selection and support of CDDs, retention of CDDs, maintaining a balanced CDD gender mix, and the close proximity of CDDs' residences to the communities they serve are key hallmarks of strong community directed treatment programs [20].

Chapter 2.2: Factors that jeopardize the sustainability and success of the community-directed treatment strategy

Studies conducted in Africa have shown the factors that jeopardize the sustainability and success of community-directed treatment programs, as well as the barriers and facilitators of coverage and compliance, including the motivation and performance of CDDs. A study conducted in Cameroon on community-directed treatment to control onchocerciasis showed that weak community participation and low coverage were due to unfavorable distribution times and mode, poor social mobilization and health education before MDA, low engagement of community leaders, inadequate and untimely funding, attrition of CDDs, and low community and health center monitoring of MDA [21]. In Ghana and Tanzania, fear of side effects, beliefs that drugs were no longer necessary, insufficient performance and motivation of CDDs, and low disease and MDA knowledge among migrants were associated with low coverage [22, 23]. Furthermore, systematic reviews on factors associated with the implementation of MDA summarize that barriers to implementation of MDA include delays in drug delivery, inappropriate distribution strategies for urban areas, lack of consideration of unregistered individuals such as migrants, limited number of CDDs due to unfavorable incentives, high workload, and unrealistic household targets for CDDs [24, 25].

Research has shown that CDDs are motivated to volunteer for the NTD program by intrinsic incentives, such as gaining recognition as the community's clinician, self esteem from social status enhancement, trust from communities, and increased knowledge about diseases [17, 18, 23, 26–28]. The idea of not providing CDDs with financial incentives has been challenged in the past and various groups have advocated for incentives. However, providing them would not be sustainable for settings that are under-resourced. A study in Nigeria showed that if CDDs were financially compensated at appropriate rates by the national NTD program, Nigeria would need to spend over US $47 million dollars annually [29]. Although, the strategy of providing financial incentives to CDDs is not widely implemented, there are a few countries that provide them in the form of alternative incentives, such as transport money, boots, raincoats, and bags [30]. In relying on community volunteers to distribute treatment, the cost of delivering treatment is around $0.50 per person unless medicines were distributed by health workers [31], underscoring the advantage of recruiting volunteers to deliver care at very low cost.

Gender roles, norms, expectations, and behaviors have implications for the recruitment, training and promotion, compensation, and the availability of policies that protect front line health workers [32]. In 2013, the proportion of women employed by the global health and social sectors amounted to 70.3% [33]. Women, who are often the main providers of health, deliver care to five billion people globally and contribute three trillion United States dollars annually to global health [34]. However, the majority of women's contribution to global health is in the form of unpaid care work and volunteerism [34]. The final report of the expert group to the high commission on health, employment, and economic growth and the 2016 global burden of disease show that mortality rates across all age groups over the past 50 years is due the contribution of women to health care [35].

Despite the significant contributions of women in the health workforce and the progress made on gender equity and workers' rights across the globe, women who help the health system function do not have an equal say with men [33]. These barriers have implications for health worker training and supply pipeline, recruitment, deployment, retention, and attrition, and contribute to health workforce distribution imbalances between the formal and informal health workforce, as well as between the public and private sectors [36]. Also, when women in the health workforce are

categorized into lower status and underpaid (or unpaid) jobs, health systems lose female talent, perspectives, and motivation [33].

Although there is limited data on gender and sex among community health workers, Shoemaker and colleagues posit that the gender and sex of CDDs can impact accessibility and acceptability of NTD medicines among at-risk populations living in distinct cultures and contexts [32]. This reflects the importance of considering gender in the planning and implementation of health campaigns. In most countries, CHW programs are made up of more women than men with the widespread belief that women are more effective as CHWs. Some communities prefer female CHWs; however, CHWs may experience challenges with delivering care to male clients [37]. On the other hand, CHWs that are perceived as better able to respond to gender-based constraints on women's access to health services endure challenges [38]. This is because country programs operated in the same gender systems that necessitated their appointment of CHWs [38]. As a result, CHWs experience low job satisfaction, which can lead to lack of the provision of quality health services [37]. Gender-based constraints norms can also influence CHWs' decision to join health programs, as well as their retention. For example, in patriarchal societies where men are not easily involved in voluntary work, the involvement of husbands can increase coverage of community health services [39, 40]. In societies where men make most of the decisions on health, women cannot allow male workers into and near their home. NTD programs and communities may prefer female drug distributors; however, in cultures where men discourage the use of medications, male drug distributors may be more effective at engaging communities [41, 42]. In a study conducted by Shoemaker and colleagues using NTD program data to explore gender dynamics among CDDs and their supervisors, data showed that women's lower educational and literacy levels make them ineligible for CDD positions [32]. In addition, NTD program managers report that opportunity costs related to household, work, and caregiving responsibilities cause many women to be unavailable for CDD positions [32]. The selection and occupation of CDDs also impact male-to-female ratios. For example, in Haiti and Senegal, the NTD program recruits mostly teachers and nurses to deliver medicines to communities or to supervise and train CDDs, limiting the influence that the program has over the composition of their drug distribution workforce [32]. Also, in Ghana, Mali, Tanzania, and Uganda, the NTD programs use community-based selection processes within the context of local cultural and gender

norms, limiting the influence of programs [32]. Furthermore, female drug distributors may also not be recruited due to security concerns, especially where there is conflict, sexual harassment, verbal and physical abuse, and unrest [32]. In most countries in the study, the community health workforce was made up of mostly males and has remained unchanged over the years [32].

These findings highlight the importance of understanding how gender roles and relations influence health-seeking behavior and NTD program delivery, as well as the importance of decreasing harm and exploitation of workers and their time. There is a need to protect CDDs' rights and ensure gender balance in the selection, recruitment, training, and engagement. The creation of standard service and facilitation of CDDs' integration into the local health system will be a useful step towards gender equity [43].

Chapter 3: Occupational stress and work demands

Several studies have documented that, during MDA, CDDs experience burnout from high workload; have difficulties with accessing to households; experience traumatic stress from resistant community members; and dissatisfaction with the pressure to achieve their targets with limited resources and incentives [17, 26, 28, 44, 45]. In order to critically examine CDDs' on-the-job experiences, it is important to understand the nuances and constructs of job-related stress.

Chapter 3.1: Stress in the workplace

According to Selye (1936), stress is a response of the body to persistent and unmet demands for change [46]. Some stress can be positive as it can motivate employees to be productive; however, stress that occurs frequently can have negative effects, such as strain and burnout [47]. Butler (1993) defines stress in three ways, namely a stimuli-based definition, a response-based definition, and stress as a dynamic process [48]. The stimuli-based definition explains that external pressure or stimuli increase the load or weight of pressure on the individual [48]. The response-based definition conveys that physiological responses to stress can occur when an individual is exposed to harmful stressor or have a strong dislike for a stressor [48]. Stress as a dynamic process means that some stress reflect internal and external

factors, including the characteristics and circumstances of the individual, and the interactions between them [48].

The WHO defines work-related stress as reactions that occur when workers are presented with work demands that do not match their knowledge, skills or abilities, and challenges their ability to cope. Workers' reactions to stressors may include:

- Physiological responses (e.g. increased heart rate and blood pressure)
- Emotional responses (e.g. feeling nervous or irritated)
- Cognitive responses (e.g. lack of attention and forgetfulness)
- Behavioral reactions (e.g. aggressive and impulsive behavior)

Work-related stress also entails:

- The response people may have when work demands and pressures do not match up to the knowledge and abilities, challenging their ability to cope
- A response to work circumstances that are made worse when employees feel they have little support from supervisors and colleagues, and little control over work processes
- A lack of understanding, among managers, of the differences between pressure or challenge and stress; thereby increasing stress in the workplace
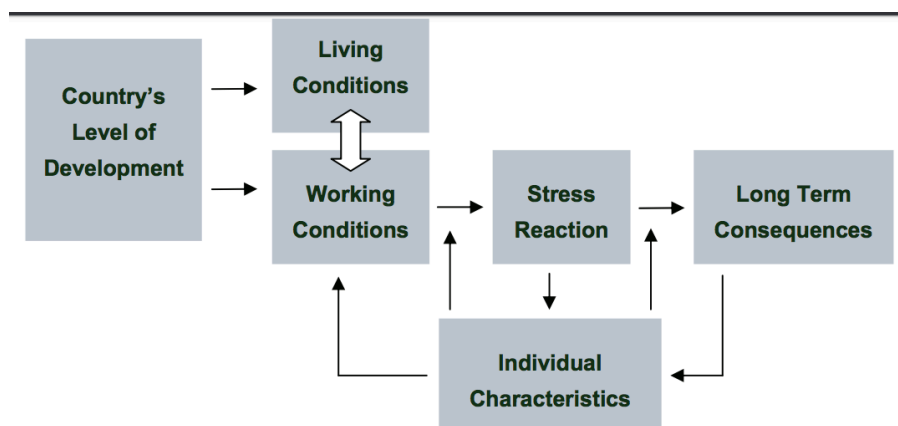
Figure 4: Contextualized model on causes and consequences of work-related stress
Source: WHO, 2007

Figure 4 shows the interactions between a country's level of development, living conditions, working conditions, individual characteristics, stress reaction, and long-term consequences. When people are exposed to various risk factors, they experience stress reactions, such as emotional, behavioral, cognitive, and or

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physiological reactions. Frequent stress can then result in irreversible health outcomes, such as chronic fatigue or cardiovascular diseases. Individual characteristics that may exacerbate the effects of stress include personality, values, goals, age, gender, ability to cope, and level of education. Furthermore, workers have their own personal and social challenges to deal with outside of work, which has implications for his or her ability to cope with stress reactions. The level of development of a worker's country also determines workers' quality of work. For example, developing countries may not have laws that protect the rights of workers that are employed by governments and private organizations, which may create stress for workers [49].

The WHO also outlines that factors, such as job content, workload, participation and control, status and pay, job content, organizational culture, and interpersonal relationships, are causes of workplace stress [50]. The causes for workplace stress that is specific for women are:

- They play roles at home and at work, leading to a lack of work-life balance
- They must conform to gender norms and values while playing an independent role
- They experience sexual harassment at work
- They are more likely to receive lower wages and have high job demands

Chapter 3.2: Community health workers and workplace stress in Africa
Community health workers have played a significant role in the delivery of preventive health services and improving access and coverage. However, expansions of their job description and changing socio-economic contexts in Africa have resulted in occupational stress and burnout from high workload, limited support, and walking long distances [51–53]. The Declaration of Alma Ata in 1978 defined community health workers as one of the important providers of primary healthcare. Following the Declaration, one of two critical agendas emerged for community health programs. This agenda focused on the engagement of communities in the process of taking responsibility for their health [54, 55]. In response to the Declaration, many developing countries conducted mass trainings for CHWs [56], identifying them as voluntary health workers or the third workforce of "Human resource for Health" [57]. The CHW programs across countries not only evolved, but also varied by conception and practice of CHWs, aspirations, and economic capacity [43]. Prasad and

Muraleedharan (2007) identify seven critical factors that influence the overall performance of CHWs, including gender, education, selection of CHWs, nature of employment, career prospects, and incentives, population and service coverage, training, feedback, monitoring mechanisms, and community participation [43]. In order to understand the factors that influence the overall performance, retention, motivation of community volunteers for the NTD program, it is important to critically examine the history of CDDs in NTDs and factors that jeopardize the sustainability and success of community-directed treatment programs.

Chapter 3.3: Globalization and labor rights

Scholars have examined the relationship between globalization and human rights; however, labor rights are very distinct from overall human rights, which encompass civil and political rights and protection of physical integrity [58]. Globalization and industrialization not only changed trading practices and living and communal conditions, but also the nature of work. For example, craft-based and agricultural work conducted by families or communities were transformed by new forms of labor, making their work repetitive and took workers away from their families [58]. In a study conducted by Mosley and Uno (2007), it was determined that the effects of globalization on labor rights depend on the extent to which a nation is integrated into the global economy [59]. Furthermore, direct investments are associated with better collective labor rights, but trade openness negatively affects collective labor rights [59]. In addition, there is a positive relationship between the behavior of peer nations and national labor rights outcomes. Moreover, a country's level of democracy, its income per capita and population, and the occurrence of civil conflict are positively associated with labor rights [59]. There have been concerns about governments removing or not enforcing labor laws in order to attract foreign direct investment [60]. Davies and Vadlamannati (2013) also found a positive and significant spatial lag in the ability of workers to bargain collectively, which suggests that competition in taxation, environmental regulation, and labor standards is less in the institution of standards but in their enforcement [60]. Mosley (2017) posits that the protection of people for labor will only be possible if incentives for organizations and governments align [59]. Furthermore, when countries, organizations, shareholders, and consumers prioritize workers' rights, there can be effective government regulation and enforcement, which is required for improved labor standards' [61]. In contrast,

governments are also part of the problem given that the incentives they have to serve the interests of investors at the expense of local labor [59].

Chapter 4: The Kenyan context

Chapter 4.1: Overview of Kenya

Kenya is a country in east Africa, bordering the Indian Ocean, between Somalia and Tanzania. In 2019, Kenya had a population of over 53 million people and a gross domestic product of $79 billion [62]. It has over 8 ethnic groups that practice different religions, including Christianity, Islam, and Traditionalism; and the majority are Protestant or another Christian denomination [63]. As of 2017, 28% of Kenya's population lived in urban areas with a 4.2% annual rate of increase. Its major urban areas include Nairobi and Mombasa. The government of Kenya invests 5% of gross domestic product in health [62]. The 2014 demographic survey reported 137,780 persons, of whom 51% are female and 49% are male [63].

Chapter 4.2: NTDs in Kenya

There are 14 NTDs that are endemic in Kenya, including soil-transmitted helminthiasis, schistosomiasis, LF, trachoma, leishmaniasis, dengue & chikungunya, rabies, leprosy, cystic echinococcosis, taeniasis, foodborne trematodiases, onchocerciasis, and human African trypanosomiasis. LF is typically endemic in Kenya's coastal regions with approximately 3.7 million people at risk of infection and 1 million people infected [64]. The National Programme to Eliminate Lymphatic Filariasis was established in 2001 to deliver preventive chemotherapy through MDA to eliminate LF. In 2002, after mapping to confirm endemicity in the coastal region, the national program commenced MDA. However, financial constraints and human resource challenges resulted in postponement of MDA and the achievement of 100% geographical coverage. In 2015, MDA for LF had began in 17 out of the 23 endemic sub-counties in coastal Kenya where more than 2.3 million people were treated [64]. In spite of Kenya's early start in 2001, MDA is still on going due to inconsistent and ineffective implementation. In 2013, a renewed commitment by African Ministers of Health and the Resolution to scale up control of NTDs at the 66th WHA, inspired countries like Kenya to accelerate control and elimination of NTDs [65]. In 2016, Kenya launched its second national strategic plan (2011-2015) for the control and elimination of NTDs. The document is a multi-year plan that outlines strategies

strengthening national programs to accelerate progress towards NTD goals and increase engagement between national and international stakeholders. In 2016, Evidence Action, an NGO headquartered in the United States and funded by the END Fund, began providing support to Kenya's NTD program as it carried out mass treatment for LF from 2016 until date.

Chapter 4.3: Kenya's economic standing in 2002

In 2002, when the NTD program was launched in Kenya, the country faced unemployment, corruption, and ethnicized politics, which slowed down its development in all sectors [66]. Furthermore, growth in wage employment decelerated between 1998 and 2001, which had not been the case since independence [67]. In 2001, the government's allocation of the equivalent of 1.7% of gross domestic product to the health sector was lower than the continental average of 2.5% of gross domestic product. Following increased government expenditure amidst stalled economic growth and a lack of international assistance due to governance conditions, the Kenyan government could not make budgetary allocations for social services [67]. This continued to worsen in 2002 and 2003 amidst increased expenditure and low revenue [67]. Despite some growth in the economy in 2003, Kenya could not reverse the five successive years of decline in income per head [67]. These setbacks would have implications for building a resilient primary healthcare system and planning, implementing, evaluating, and scaling MDA amidst decentralization of the health system.

Chapter 4.4: Kenya's Health System

Kenya's health system consists of six hierarchical levels, including: level 1, community services; level 2, dispensaries and clinics; level 3, health centers and maternity and nursing homes; level 4, sub-county hospitals and medium-sized private hospitals; level 5, county referral hospitals and large private hospitals; and level 6, national referral hospitals and large private teaching hospitals [68]. In 2016 and 2017, Kenya's health budget was estimated to be 60.3 billion Kenya shillings (ksh) (US$ 603 million), which accounts for approximately 4% of the total budget [68]. Each year, one-fifth of funds are allocated to county governments for their healthcare services activities. Approximately 40% of the health budget goes to curative services and the only budgetary allocations for primary healthcare are sent to counties to compensate for user fee removal for primary facilities, establishing primary health

care facilities in poor or hard-to-reach areas, upgrading clinics in slums; and providing free maternity services [68]. At the county level, healthcare facilities receive funding from various national and international sources. These facilities also receive funding from development programs through NGOs and community-based organizations [68]. Figure 5 shows funding streams for primary healthcare in Kenya.
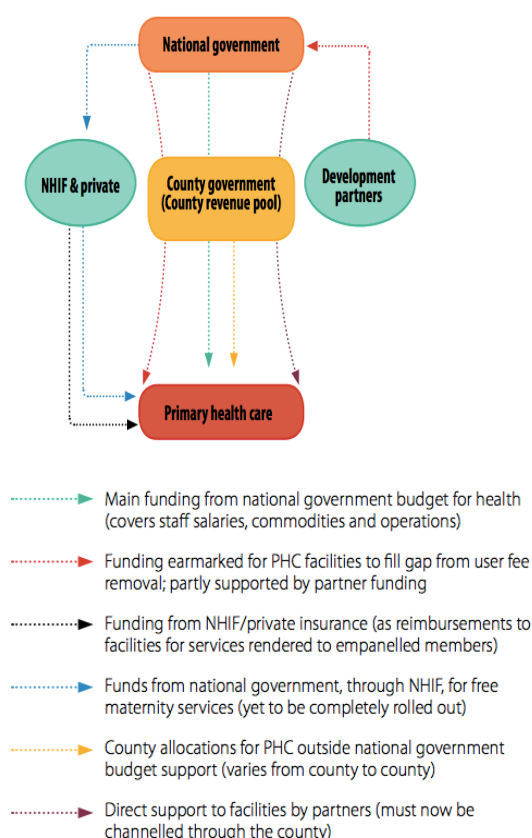
Figure 5: Funding Streams for Primary Health Care in Kenya

Source: WHO, 2017

Primary healthcare services are provided at the community and health center levels. Figure 6 shows staffing structure in healthcare facilities and communities. Kenya developed a primary healthcare policy in the 1970s; however, actionable strategies, decentralization, intersectoral collaboration, and community participation in health did not become a reality until the late 1980s [68]. In 2005, the Kenya Essential Package for Health concept was adopted to facilitate the development of actionable strategies towards primary health care [68].
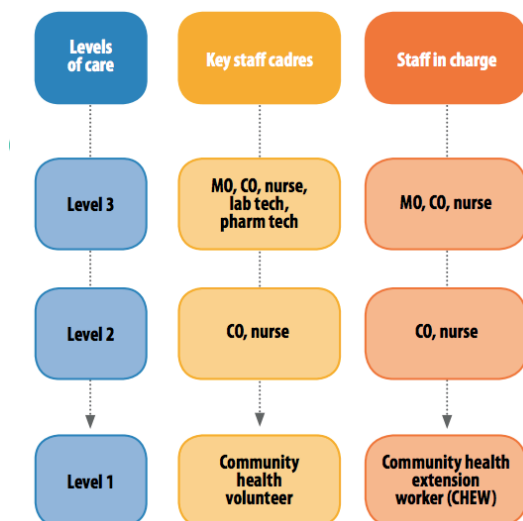
Figure 6: Staffing of Public Primary Health Care Facilities and Community Units
Source: WHO, 2017
Key: CO = clinical officer; MO = medical officer; lab tech = laboratory technologist/ technician; pharm tech = pharmacy technician

Kenya has several policies that govern the delivery of health services, namely the Kenya Health Policy (2014–2030), the Health Sector Strategic and Investment Framework (2013–2017), Human Resources for Health Norms and Standards, the Kenya Quality Model for Health, the Patient Service Charter, and Guidelines for Referral of Patients. These are summarized in Table 1. The Patient Service Charter is made up of guidelines that require that all facilities display charters showing services offered, obligations of the patients, charges, and waiting times [68]. Finally, county pharmacies are responsible for processing orders from health facilities, aggregation, and submitting orders to the Kenya Medical Supplies Authority [68].

Chapter 4.5: The evolution of primary healthcare in Kenya
In its 2010 constitution, Kenya devolved the health sector to national and county governments. This action would increase decision-making power at the district and facility levels, including resource allocation to these levels. This would also allow for greater community involvement in health management [69]. The decentralization process was largely driven by a political push by county governments to overcome marginalization and inequitable resource allocation in their constituency [69, 70]. Consequently, the national government became responsible for oversight in health policy, management of national referral health facilities; and the provision of capacity building and technical assistance to counties [68]. The county governments are

responsible for county health services, construction of health facilities, equipment and medication in health facilities, and human resources [68]. The Kenya Health Policy 2014-2030 highlights the following objectives of devolution:

- Equity in the distribution of health services and interventions;
- A people-centered approach to health and health interventions;
- A participatory approach to the delivery of interventions;
- A multisectoral approach to realizing health goals;
- Efficiency in the application of health technologies; and
- Social accountability.

In the effective engagement of CDDs before MDA, during MDA, and post MDA through training, supportive supervision, social mobilization in communities, data collection and collation, directly observed treatment, availability of transport and communications, equitable distribution of workload, and incentives, the above-mentioned points are realized.

Chapter 4.6: Challenges associated with the devolution
Although the devolution was intended to promote universal health coverage, there is inequitable distribution of services, with access according to ability to pay rather than need for care [71].

Challenges associated with the devolution of the healthcare sector threaten quality healthcare service delivery to those that need it the most, including human resources, infrastructure, legal framework, financial and material resources, and the relationships between the county and national governments [72, 73]. At the national level, poor management, resource distribution, ethnicity domination, unfavorable working conditions, and delayed salaries result in inconsistency in the implementation of activities and policies, and lack of coordination between the national and county governments [74]. Furthermore, out-migration of staff from various communities has resulted in disparities in the number of health personnel that serve citizens. This is due to ethnic tensions, frustrations experienced by workers, and political propaganda that discourage outsiders from employment in various counties given historical marginalization of various communities [74]. Furthermore, poor staff distribution and remuneration, and high attrition rates are all challenges the county and national governments encounter even until today [75].

Health worker strikes over the last several years demonstrate the dissatisfaction of county governance among healthcare providers [75]. Healthcare workers are concerned about job security, which forces them to resign and find alternative employment [76]. There are also reports of allocated funds being misused or inconsistent, affecting the timely and efficient implementation of health activities and functioning of health facilities [74]. Karuiki (2014) posits that the delay in resource allocation to counties is so persistent that some leaders see it as a political push for putting power back into the hands of the national government [77]. In addition, insufficient human resources have forced county governments to task health workers with the management of health facilities [74]. Furthermore, the procurement of goods and services at county level has resulted in a lack of clear procurement plans, resulting in a lack of accountability for stolen drugs [74].

Chapter 5: The NTD program in Kenya

Chapter 5.1: CDDs in Kenya

Community drug distributors are responsible for distributing drugs to their communities that selected them. CDDs may also serve as community health volunteers for other health programs. Each CDD is expected to cover a total of 100 households. It is assumed that CDDs know their community well and are able to find everyone in each household; sensitize community members about MDA and its benefits; promote compliance; attain sufficient tablets for planned households; visit each home; return to households they initially missed; record the number of people treated in booklets and submit them to community health extension workers (CHEWs), along with remaining tablets; refer severe adverse events cases to the nearest health facility; and engage in regular check-in with their assigned CHEW. During training, CDDs are expected to provide dates for community sensitization and mobilization, which takes place a week before MDA. They provide the community with information about how LF is transmitted, can be prevented, the safety of medicines, potential side effects, and MDA timing. Prior to administering treatment, CDDs are required to conduct a household registration and record the names of all household members, including visitors. This process aids CHEWs in determining the number of tablets to allocate to each volunteer. Community drug distributors are also expected to not treat children under the age of 2, individuals that are pregnant and or

breastfeeding women, severely sick persons, and persons with a known allergy to DEC or ALB. Table 1 shows eligible members for treatment and dosage.

Age	Dose: DEC	Dose: ALB
2-8 years old	100 mg (1 tablet)	400 mg (1 tablet)
9-13 years old	200 mg (2 tablets)	400 mg (1 tablet)
14 years and older	300 mg (3 tablets)	400 mg (1 tablet)

Table 1: Dosage and medicines by age
Source: Ministry of Health, Kenya

Drug Administration
Community drug distributors are expected to take the following steps upon entering a household:
- Confirm the names of household members previously recorded
- Instruct all members to wash their hands
- Conduct directly observed treatment of all eligible members

Community drug distributors are instructed to refrain from forcing members to accept treatment and to be sure to provide health education to individuals who refuse to ingest pills. They are also informed that some people may experience side effects like stomach pain, headaches, dizziness, or nausea, and should refer these individuals to the nearest health facility. If there is a household member who is unable to ingest the pills, CDDs will use a spoon to crush pills. All distributed treatment should be recorded in the MDA register booklet. The register and tally sheet capture information, such as whether a person did or did not swallow the tablets, reasons for refusal, and age and sex. CDDs are provided with per diems during training and MDA, as well as bags and T-shirts.

Chapter 5.2: Challenges with the implementation of NTD interventions
Similar to other primary healthcare programs, the NTD program in Kenya has limited financial and human resources, poor administrative structures at the county level, and low drug supply to deliver interventions to those that need it. In addition, the program is concerned with sustaining the impact of NTD interventions after the end of donor funding, insecurity in endemic regions that halt MDA, access to hard to reach areas, poor communication networks, little investment in operational and implementation research, and limited monitoring and evaluation [64].

Chapter 6: Guiding theoretical frameworks for the dissertation

This dissertation is a response to the need for more implementation research in order to develop cost-effective strategies that improve the effectiveness of the NTD program in the delivery of medicines to vulnerable groups. Guided by the socio-ecological model and the PQoL tool, this work systematically examines the role of CDDs in the achievement of the elimination of LF in Kenya, and investigates the multiple levels of influences of factors associated with the optimal performance of CDDs.
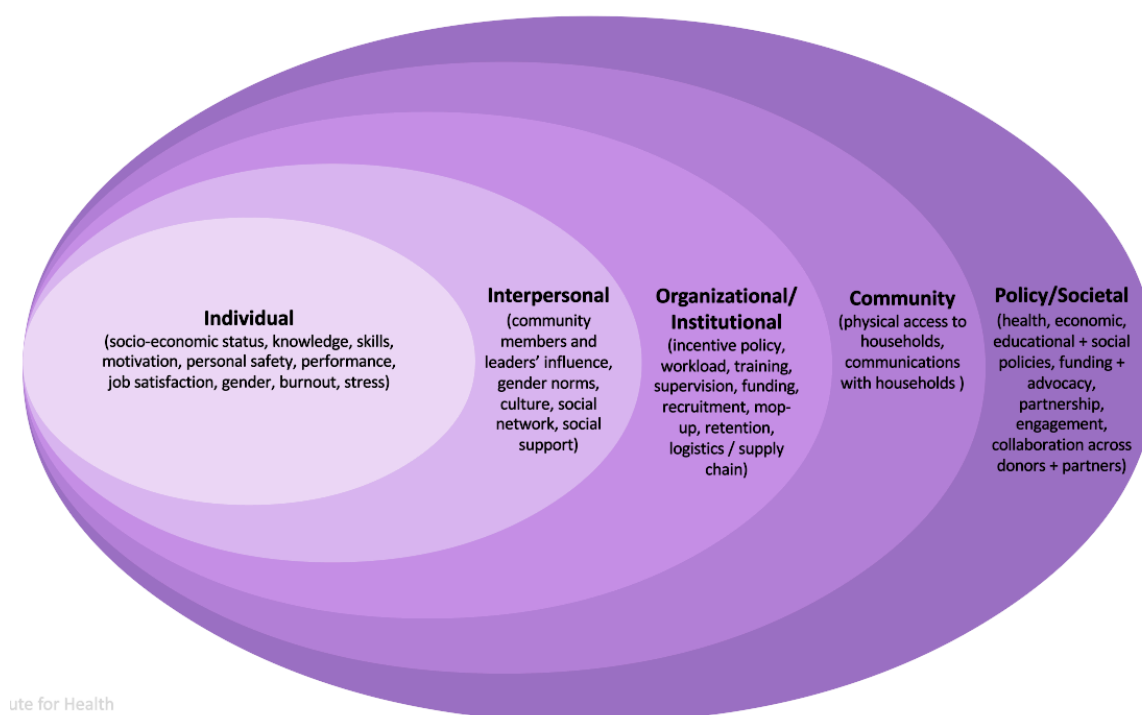
Figure 7: Socio-ecological Model

The socio-ecological model describes the complex interactions between individuals and their social environment (see Figure 7). More specifically, it allows us to understand the range of factors that impact the effectiveness of CDDs. The overlapping rings in the model illustrate how factors at one level influence factors at another level. At the individual level, CDDs' effectiveness are shaped by their performance, gender, burnout, stress, physical exhaustion, and their level of knowledge of diseases. At the interpersonal level, CDDs' effectiveness are shaped by communities' acceptance of them, community culture, and social support and norms. At the organizational/institutional level, CDDs' effectiveness are shaped by

various upstream programmatic factors, including program incentive policies, workload distribution, trainer of trainers, supervision, recruitment, logistics and supply chain, funding, and data collection and flow. At the community level, CDDs' effectiveness are shaped by their ability to physically access hard-to-reach and remote areas; communicate effectively with supervisors and communities; community social capital; social norms, and their understanding of diseases and MDA. Finally, at the societal/policy level, CDDs' effectiveness is shaped by health, economic, educational and social policies; funding and advocacy; partnership, engagement, and collaboration across donors and partners; and misaligned goals between countries and global partners. In order to begin to address the challenges that CDDs and the NTD program face, we must critically look at the macro levels, namely policies and agencies, and the micro levels, namely individuals, their setting and built-in environment, and social and interpersonal relationships.

Research has shown that individuals in helping professions (e.g. mental health workers, community health workers, nurses, social workers) are more likely to be exposed to trauma, burnout, and compassion fatigue [78–80]. These exposures may lead to low retention and performance, and affect those around them. The PQoL framework highlights the negative and positive aspects of the work that helpers provide to others, both of which affect their PQoL. Figure 9 illustrates the theoretical path analysis for those that are in helping professions or are informal caregivers. Helpers' work, client (person that receives help), and personal environments shape the positive and negative aspects of their work, namely compassion satisfaction and fatigue [81]. According to Stamm (2010), compassion satisfaction is the pleasure that people experience as a result of being able to do their jobs well. This pleasure can be viewed as altruism [81]. Compassion fatigue is made up of burnout and secondary traumatic stress. Individuals that experience burnout often have feelings of hopelessness and difficulties in their work or in doing their jobs effectively [81]. These feelings come gradually and make helpers think that their efforts make no difference, or the feelings come as a result of high workload and a toxic work environment [81]. In addition, helpers experience exhaustion, frustration, anger, and depression. Helpers that experience secondary traumatic stress (STS) have experienced extreme trauma and stressful events [81]. The negative effects of STS include fear, inability to sleep, and intrusive thoughts [81]. For example, a work environment that is perceived to be dangerous emotionally or physically can have an effect on the development of

compassion fatigue. In contrast, a helper may feel fulfilled by the assistance they provided, in spite of the conditions of a work environment. Figure 8 shows the theoretical path for compassion fatigue and compassion satisfaction and figure 9 illustrate the components of the PQoL where compassion satisfaction is the positive aspect of one's work and compassion fatigue is the negative aspect of one's work.
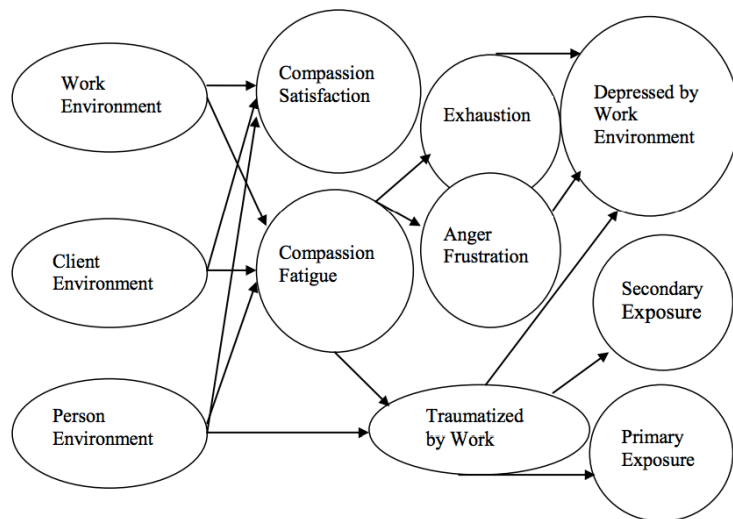
Figure 8: Theoretical Path Analysis

Source: Stamm, 2010
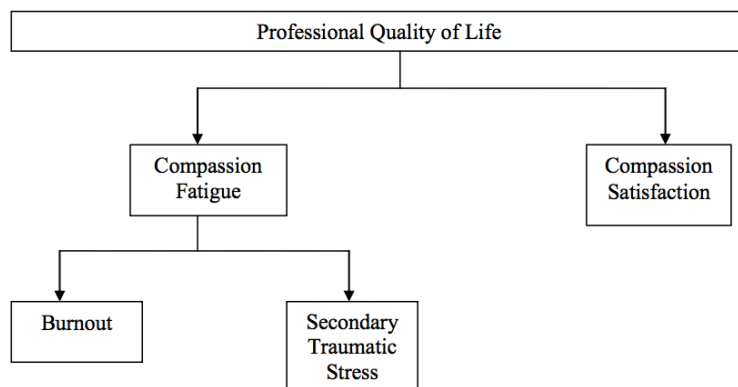
Figure 9: Diagram of PQoL

Source: Stamm, 2010

Chapter 7: The dissertation study

Chapter 7.1: Rationale for the research

NTDs affect poor, marginalized, hard-to-reach, and vulnerable communities; and although interventions like preventive chemotherapy are free of charge, many do not receive or accept them. Since the release of the first NTD roadmap by the WHO in 2012, significant progress has been made, including the elimination of LF in 16 countries across the world [82]. Despite this progress, many countries in the last hard-to-reach mile will not be able to meet targets due to various factors, including limited resources, lack of measurement of impact, country ownership and financing, and, mainstreaming of NTDs into the health system [83]. These barriers have resulted in poor implementation of MDA, including failure to address factors that influence the motivation and performance of CDDs [30, 44].

With the recognition that the NTD community relies heavily on CDDs to effectively and safely deliver treatment to accelerate elimination, there is a need to examine the positive and negative influences that CDDs have on the achievement of universal health coverage, equity, gender equality, and human rights in NTDs. In February 2020, the WHO executive board met and requested the Director-General to develop the new road map for NTDs from 2021 to 2030 [83]. This roadmap calls for renewed momentum and crosscutting approaches to accelerate the impact of NTD interventions [83]. The NTD community can only achieve targets associated with this roadmap by first understanding which groups are being left behind and why.

Until recently, Kenya conducted sporadic and ineffective MDAs that slowed down progress towards the elimination of LF due to many of the barriers described above [84, 85]. However, in 2018, Kenya began to successfully form partnerships with donors, academic institutions, and implementing organizations to scale and equitably deliver NTD interventions [86]. This led to the achievement of 87% coverage during LF MDA using triple drug therapy, a new drug regimen that accelerates the elimination of LF and reduces the number of years required to interrupt transmission [86]. Using the roadmap as a framework for achieving impact, Kenya must sustain the momentum and continue to build on lessons learned and evaluate its approaches to maximize impact. We hope that the findings and recommendations from this dissertation will help to empower the NTD program to reach all at-risk groups.

Chapter 7.2: Research aim

This dissertation project aimed to examine the global policy around the use of CDDs to achieve global NTD targets, explore and describe factors associated with CDDs' performance and retention during MDA, and provide recommendations for improving repeat rounds of MDA in Kenya.

Chapter 7.3: Objectives

1. Conduct a retrospective policy analysis to identify factors that influenced global policy around the use of CDDs to deliver preventive chemotherapy to at-risk groups, and assess the extent to which evidence was used in this process.
   a. The Rise to Importance: A Health Policy Analysis of the Adoption of Community Volunteers in Neglected Tropical Diseases to Deliver Preventive Chemotherapy
2. Explore and describe perceptions of CDDs in endemic communities, and among supervisors and the NTD program in Kenya using qualitative data.
   a. The Fight Against Lymphatic Filariasis: Perceptions of Community Drug Distributors in Coastal Kenya
3. Explore and describe the programmatic and socio-cultural factors associated with CDD performance and retention in Kenya using quantitative and qualitative data.
   a. Professional Quality of Life Among Community Drug Distributors In The Fight Against Lymphatic Filariasis
4. Provide recommendations for improved engagement of CDDs in Kenya.

Chapter 8: Methods

Chapter 8.1: Study Sites
The WHO suggests that countries achieve an epidemiological or effective coverage of greater than or equal to 65% for 5 consecutive rounds of MDA. After 5 rounds, implementation units (IUs) are eligible to conduct a transmission assessment survey to validate the interruption of transmission and disease prevalence. Epidemiological coverage is attained by examining the proportion of the number of individuals ingesting the medicines at the IU level to population living in IU where MDA is

implemented [87]. According to 2015, 2016, and 2017 MDA treatment reports, Kaloleni and Mvita sub-counties achieved coverage of 61%, 58%, and 79% respectively. In 2016 and 2017, Mvita sub-county achieved coverage of 51% and 59% respectively [64]. Kaloleni sub-county in Kilifi County is a rural area in coastal Kenya near Mombasa that is home to approximately 193,682 people [88]. Kaloleni residents have some of the poorest health indicators in Kenya with high rates of exposure to traumatic stressors, including intimate partner violence (39.4%), alcohol abuse (17.6%), deaths related to the Human Immunodeficiency Virus (HIV) infection (6% prevalence) and extreme poverty [88]. Compared to the national poverty rate of 45.9%, Kaloleni has a poverty rate of 70.8% [89]. Mvita sub-county in Mombasa County is an urban area with a population of 147,983 people, 38% affected by poverty, food insecurity, sex work, and high HIV prevalence [88].

Chapter 8.2: Overall project design

The overall project design was an analytic and descriptive cross sectional study and policy analysis. The rationale for this design is that the lead researcher sought to draw an inference about the engagement of CDDs in coastal Kenya and measure certain outcomes at one point in time, establishing a link between the independent and dependent variables outlined below. Sampling considerations are outlined below.

1. Conduct a retrospective policy analysis to identify factors that influenced global policy around the use of CDDs to deliver preventive chemotherapy to at-risk groups and assess the extent to which evidence was used in this process.
    a. Study design: Using the policy triangle framework, a literature review of published and grey literature was conducted.
    b. Measurements: 1) Context in which the problem was identified and policy developed; 2) Actors involved in the policy development process; 3) Process used to develop the policy; 4) Evidence used in policy development.
    c. Sampling consideration: Purposive sampling of official reports and peer-reviewed journal articles related to Kenya and LF elimination.
    d. Analysis: The analysis consisted of the chronological review of official progress, assessment, and meeting reports. Informal interviews with key informants within NGOs and the WHO led to the identification of relevant documents and validation of information. Thematic analysis

was conducted and themes categorized based on the following measures: content, actors, process, and context.

2. Explore and describe perceptions of CDDs among communities, supervisors, and the NTD program using qualitative data to elucidate factors that affect CDD performance, retention, job satisfaction, burnout, and secondary traumatic stress.

   a. Study population: CHEWs, the NTD program, and community leaders and members.

   b. Study design: Qualitative in-depth interviews and focus group discussions with community members, CHEWs, CDDs, community leaders, and the NTD program.

   c. Sampling consideration: Convenience sampling of community leaders, CHEWs, community members, and NTD program officials.

   d. Analysis: We conducted content analysis of the data, following an iterative process of deductive and inductive methods to identify predetermined and emergent themes. Predetermined themes included community engagement with CDDs, NTD program engagement with CDDs, and CDD motivation and remuneration. This analysis plan is supported by Gale and colleagues (2013) [90].

3. Explore and describe the relationship between programmatic and socio-cultural factors and CDD performance and retention using quantitative and qualitative data.

   a. Study population: CDDs.

   b. Study design: Cross-sectional quantitative research design using a survey. In-depth interviews with CDDs were used to triangulate and explain results from the survey.

   c. Sampling consideration: Convenience sampling of CDDs that participated in the most recent MDA.

   d. Measurements:

      Dependent variables

         a. **Main outcome**

            a. Performance during most recent MDA: CDD performance scores were calculated using three questions: How often do people swallow the medicine in front of you? How often do you

sensitize the community before MDA starts? Are you able to reach all the households you are assigned to by the end of MDA? Each question had three possible choices, namely never, sometimes and always.

b. Secondary outcomes

    a. Retention: Retention was assessed using the question: Will you participate in the next MDA as a CDD? The possible answers were yes or no.

    b. PQoL: The negative and positive aspects of one's work were represented by three constructs using five-point Likert sub-scales where "one" indicates never and "five" indicates always. These aspects of work are represented by three constructs within three subscales: 1) Job Satisfaction, 2) Burnout, and 3) Secondary Traumatic Stress. Burnout and Secondary Traumatic Stress broadly reflect 'the natural, predictable, treatable, and preventable unwanted consequences of working with suffering people.' Job Satisfaction is defined as the positive effects derived from work that involves helping people and provides a buffer when one experiences burnout or stress [81].

        i. Burnout

        ii. Secondary traumatic stress

        iii. Job satisfaction

Independent variables

    a. Household income

    b. Number of households served during MDA

    c. Length of tenure as a CDD

    d. Participation in other health activities

    e. Mean amount in Kenyan shillings out of pocket costs

    f. Mean number of hours allocated to NTD programmatic activities (training, sensitization, mobilization, drug pick-up, reporting, MDA)

g. Burnout

h. Secondary traumatic stress

i. Job satisfaction

j. Attitude and motivation

d. Analysis: Random effects logistic and linear regressions were used to assess the associations between socio-demographic factors, job-related factors, total hours spent on CDD activities, and PQoL factors CDD performance and retention. Sub-counties were considered as clusters in both the univariate and the multivariate models, and all independent variables with p≤0.2 in univariate models were used to construct a multivariable logistic regression model. Mediation and moderation analyses were conducted to examine potential mediation and/or moderation effects of PQoL constructs.

Chapter 8.3: Ethical considerations

The dissertation adhered to the principles of the protection of human subjects from research risks, the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity. Informed consent to participate was obtained from all study participants, including consent to digitally record interviews. This study was reviewed and approved by the Kenya Medical Research Institute Scientific and Ethics Review Unit, and a waiver was obtained from the Ethics Committee of Northwest and Central Switzerland, approval number 2018-00694.

Chapter 8.4: Limitations

This study has potential limitations. From a methodological perspective, the study could have benefited from a larger sample size in order to precisely ascertain barriers and facilitators of CDD performance. Furthermore, random sampling and a cohort or randomized control study would have helped to establish causality, as well as to examine MDA campaign challenges and performance for each CDD over time. In addition, purposive sampling of all study participants could have resulted in selecting a homogenous group of CDDs that may not be representative of the general CDD population. Furthermore, study participants may have associated interviewers with the NTD program or the untrustworthy government; thereby providing pleasant responses to questions. The lead researcher may have read transcripts and

analyzed data from a position of privilege and cultural bias, causing her to inadvertently minimize or misinterpret various statements from study participants. Finally, although the PQoL tool was translated from English to KiSwahili and back translated from KiSwahili to English and validated all over the world, it may have been appropriate to validate the tool in Kenya.

Chapter 9: Quality control and data protection

All study instruments were translated from English to KiSwahili and Ki-Swahili to English to ensure internal validity. All interviewers received three days of training in interview techniques, data protection and confidentiality, informed consent, data storage, transcription, and uploading transcripts to an online cloud. Furthermore, all data were reviewed multiple times a week to ensure that data were captured accurately and confidentially. All interview transcripts and survey data were made anonymous. Participants' viewpoints and perspectives were accurately understood, documented, analyzed, and reported by the lead researcher. Survey data were captured electronically on a mobile tablet using the Open Data Kit platform. For the qualitative interviews, responses were captured using a voice recorder and notebook (for notes). All interview data were transcribed on a password-protected laptop and then uploaded into a password protected cloud. The survey data were immediately sent from tablets into a password-protected server. Only the researchers had access to the data, which was handled with uttermost discretion, and was only accessible to authorized personnel who require the data to fulfill their duties within the scope of the research project. A unique number identified participants. The project data is not publicly available in order to protect the identities of key informants and CDDs. Data will be stored up until January 2021.

Chapter 10: Manuscript 1 (Ready for Submission to Journal)

Rise to Importance: Adoption of Community-directed Treatment of lymphatic filariasis in Kenya - a Retrospective Health Policy Analysis

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Abstract

Background: The community-directed treatment approach for the elimination of lymphatic filariasis (LF) through mass drug administration (MDA) has resulted in the aversion of more than $100 billion in economic losses, and the treatment of hundreds of millions of people with preventive chemotherapy. However, after two decades, some countries have still not achieved national and global targets, and continue to experiences challenges around the effective engagement of communities. There is a need to critically examine the global policy around community-directed treatment to deliver preventive chemotherapy.

Methods: The current study is a retrospective analysis of the genesis and evolution of the global policy related to community drug distributors (CDDs) for delivering medicines once a year for five or more years to groups at risk of LF. The policy triangle framework was used to review, analyze. and interpret data, using Kenya as a case study. We reviewed World Health Organization and national documents, peer-reviewed articles, and partners and program reports published between 1989 and 2010. The year 2010 marked a renewed commitment by the global neglected tropical diseases (NTD) community to increase funding, which would help programs address the psychosocial barriers and health system gaps associated with low coverage and compliance.

Results: There is evidence that the community-directed treatment approach was feasible, effective, and cost-effective. However, Kenya experienced challenges with MDA implementation and scale-up. This was due to a lack of adequate financial and human resources to routinely implement, monitor, and evaluate the approach with an aim to make improvements and promote sustainability. In addition, the global NTDs community did not prioritize social science operational research that could inform evidence-based decision-making around the effective engagement of CDDs and communities.

Conclusions: In light of recent initiatives to accelerate the elimination of LF, it is critical to re-assess the engagement of CDDs. The community-directed treatment approach was designed to work under conditions and in socio-cultural contexts that have considerably evolved since the design of the concept 20 years ago. Policy makers and stakeholders must adapt the community-directed treatment approach in

the light of geographic, social, political, economic, and demographic developments to sustain the gains.

Background

The significant gains made in global public health could not have been possible without the creation and review of relevant health policies. Smoke free policies for tobacco control, preventive chemotherapy for some neglected tropical diseases (NTDs), protection from malaria through indoor residual spraying and insecticide-treated bed nets, as well as policies around the prevention of mother to child transmission of the human immunodeficiency virus (HIV), among others, have led to significant reductions in mortality and morbidity, as well as improved quality of life. The World Health Organization (WHO) defines health policy as the decisions, plans, and actions that countries and institutions take to improve health systems, address social determinants and achieve specific health care goals [42]. National health policies aim to align country priorities with the needs of the population and guide the course of action.

In the late 1980s and 1990s, there was recognition that the performance of a country's health sector was mainly determined by upstream policy rather than technical solutions [91]. There was also a strong emphasis on the role of actors, power and processes in developing and implementing policy, and the contexts within which decisions are made [91]. In the 2000s, the stage was set to realize the value from the development and implementation of policies with domestic expenditure on health growing along with the modernization and transformation of health sectors [42]. In addition, there was emphasis on the accountability of stakeholders; the expectation that policies be informed by evidence and country capacities and priorities; insistence on countries reaping the benefits of global cooperation while retaining autonomy; and a focus on the harmonization and alignment of external and internal financial and technical inputs to the health sector in order to avoid unproductive fragmentation and duplication [92].

Effective policy making requires consideration of various key principles. First, the understanding of the country context and complex interactions between institutions and their interests and ideas (John, 1998). Second, policy formation based on research evidence, acknowledging that the strength of evidence may change over time and vary across public health issues [93]. Third, consideration of health equity and the need to address social determinants of health [94]. Fourth, design with implementation in mind [94]. Lastly, it is now generally accepted that policies must be

linked with program plans and national and sub national strategies, inform resource planning and budgeting, and build an institutional base for monitoring and evaluation [42]. The upstream and downstream challenges around the policymaking and implementation process often lead to failure or underachievement. Upstream factors include the interplay between national priorities and those of global players, donors and development agencies [42]. Downstream factors are around the relationship between national policies, disease specific strategies and plans, and sub national operational plans [42].

There is a need for understanding how and why certain policies don't achieve their intended outcomes, and how such knowledge can aid policy-makers in transforming their health sector [91, 95]. Furthermore, the 58th World Health Assembly (WHA) and the Bamako Call to Action on Research for Health emphasize the need for policies that are informed by evidence to improve the lives of people [42, 96]. The use of evidence in policy can help save lives, reduce poverty and improve performance in developing countries [97]. The breadth of evidence, how evidence is introduced in the policy making process, and different individual and institutional level factors influence the policy making process [97]. The analysis of health policies can also identify factors that undermine policy implementation and jeopardize national and international targets, and help key stakeholders set realistic timescales for improvements in outcomes [91]. Despite calls to action and the emphasis on evidence in policy, gaps between research and policy continue to exist, particularly in low and middle-income countries [98]. Furthermore, although policy analysis is an established field in developed countries, its application in the developing world is often neglected [91, 99].

The WHO in its role as normative agency supports nation-states with the development of national policies, plans and strategies to achieve various health outcomes. In the 1990s, the formation of the WHO-led disease programs lead to strong partnerships between non-governmental organizations (NGO), ministries of health and academic institutions to support countries with the development of policies that improve the planning and implementation of health programs, including mass drug administration (MDA) using the community-directed treatment approach for the elimination of lymphatic filariasis (LF) [100]. Community-directed treatment against NTDs had initially been developed by the Onchocerciasis Control Program (OCP) in

response to the need to cost-effectively, efficiently, and sustainably conduct MDA without burdening the local health system [100]. One of the most important tasks of the health system in the implementation of the community-directed treatment approach is to identify, train, motivate and incentivize CDDs to deliver treatment door-to-door or at fixed posts in their own communities. However, when interventions are implemented in settings with fragmented and weak health systems, they don't always achieve intended results. Studies conducted in Kenya have shown that the motivation of CDDs, their workload, incentives, training as well as their relationship and familiarity with communities impact MDA and treatment coverage [28, 44]. Indeed, almost two decades after community-directed treatment was first introduced, Kenya continues to face challenges around the effective engagement of communities and CDDs to achieve high coverage and compliance. Thus, there is a need to critically examine the policy governing community-directed treatment to deliver medications for LF elimination. The current study is a retrospective analysis of the global policy to use CDDs to deliver medicines to groups at risk for LF, and explores how and why the community-directed treatment approach was adopted in Kenya, which factors influenced the policymaking process, the role of actors, and the extent to which evidence was used.

Methods

The policy triangle framework for policy analysis guided the study. The framework examines the interaction between context, actors, process and content concepts. We considered the contextual aspects related to the epidemiological, social, economic and political factors that influenced the development and implementation of the community-directed treatment policy related to LF. We also examined the process and objectives by which the policy was initiated, formulated, developed, implemented and evaluated, and the actors involved in the ratification of the policy [99].

The study was conducted between September 2018 and 2019, and employed a document review approach focusing on official WHO progress, assessment, and meeting reports; WHA resolutions which document official WHO policy; reports from the International Task Force for Disease Eradication convened by The Carter Center; technical documents related to LF; articles related to LF and MDA in the Weekly Epidemiological Record; meeting reports of the Technical Advisory Group on the Global Elimination of Lymphatic Filariasis, Global Program to Eliminate Lymphatic

Filariasis (GPELF), and The Global Alliance to Eliminate Lymphatic Filariasis (GAELF); and peer-reviewed journal articles related to Kenya and LF elimination published between 1989 and 2010. The year 2010 marked a renewed commitment by the global NTD community to increase funding, which would help programs address the psychosocial barriers and health system gaps associated with low coverage and compliance. It also marked ten years since the introduction of the community-directed treatment approach for LF and the release of WHO's first strategic plan (2010-2020) for LF. We additionally conducted key informant interviews with the Director of the Mectizan Donation Program, the LF Focal Point for the Expanded Special Project for the Elimination of NTDs (ESPEN), the Director of Finance at the former LF Support Center, the former NTD Program Manager for Kenya, and the Principal Investigator of the NTD Support Center at the Task Force for Global Health. The interviews helped to identify relevant documents and validate information. Additionally, the lead author served as a data source given her direct engagement with country NTD programs, the WHO, donors, and academic and NGO partners. The review of scientific articles pertaining to Kenya and LF elimination was expanded to cover 2010 until present; however, there were no relevant studies published after 2012.

We examined all documents in chronological sequence to identify information about the development and adoption of the community-directed treatment approach, assessed the evidence used in policymaking, and identified actors and events that might have shaped the policy making process. Thematic analysis of the documents was conducted, and themes were categorized based on the health policy triangle framework: content, actors, process and context [99, 101]. Comparing results across multiple data sources enabled the assessment of patterns of convergence, increasing the reliability, validity and consistency of the findings.

Results

Context

In 1987, evidence from clinical trials showed that ivermectin could be used for treating onchocerciasis [102]. After discussions with WHO in 1987, Merck and Company decided to donate ivermectin to endemic countries for onchocerciasis control through preventive chemotherapy [16]. Ivermectin needed to be given at least once per year for 10 – 15 years to a large proportion of the population in all endemic

communities. It was determined that simple and cost-effective solutions would be needed to deliver drugs at that scale. Between 1987 and 1994, community-directed treatment with ivermectin for human onchocerciasis was implemented in several African countries based on anecdotes that the approach were successful at achieving high coverage [16]. Results from a multi-country study commissioned by WHO's African Program for Onchocerciasis Control (APOC) in 1996 showed that community-directed treatment with ivermectin was feasible, acceptable, cost-effective and sustainable [16]. This led to the official adoption of community-directed treatment with ivermectin by APOC in 1997 [16].

Between 1989 and 1992, the International Task Force for Disease Eradication was convened by The Carter Center to assess the eradicability of over 90 diseases; and LF was identified as an eradicable disease [103](. The availability of new and simple diagnostic tools and medicines resulted in a shift from the focus on treatment of infected individuals to infection prevention in communities at risk [104]. In 1997, the WHA adopted a Resolution that called for the elimination of LF as a public health problem through monitoring and evaluation of program activities, development of national plans; strengthening national programmes and their integration with the control of other diseases to implement affordable and sustainable activities; strengthening national and international capacity to improve clinical, epidemiological and operational activities; and mobilization of support from all UN agencies, relevant sectors, affected communities and NGOs for the elimination of the disease [100]. In response to the WHA Resolution, the WHO launched the GPELF in 1997. The GPELF strategies included stopping the spread of infection through mass administration of ivermectin or diethylcarbamazine (DEC) once a year for five or more years, and alleviating suffering by managing morbidity and preventing disability [100]. In 1997, it was determined that the addition of albendazole could support LF elimination [100]. In January 1998, SmithKline Beecham (now GlaxoSmithKline) pledged to donate albendazole for as long as needed to eliminate LF. Merck and Company also committed to the donation of ivermectin for elimination of LF in all countries where LF and onchocerciasis are co-endemic [105].

Like APOC, the LF community also faced the challenge of delivering medicines to endemic communities using cost-effective and feasible approaches without burdening the local health system. Although APOC formally adopted community-

directed treatment as their principal method of delivering medicines to communities, a meeting at WHO affirmed that there are several important differences between onchocerciasis and LF control, requiring further research to compare the effectiveness, sustainability and feasibility of community based treatment for LF [106]. In Kenya, it was observed that several health systems factors suggested the LF elimination program should not rely solely on the health system for MDA [100]. These factors included a shortage of health workers, delays in the delivery of drugs from provincial hospitals to health facilities, the distance from households to the nearest health facilities, and little involvement of health facilities in community-based activities [100]. When interviewed, healthcare workers however expressed that communities should not distribute drugs independently, and were willing to support MDA through training and supervision [100].

Content

Community-directed treatment through the health system consists of five broad activities in Kenya, including sensitization of health service staff and communities; development and distribution of health education and information, education and communication messages and materials; training of program staff at all levels of the health system; and mode for drug distribution, monitoring and record keeping. The conditions under which the community-directed treatment approach would work included communities selecting drug distributors, the drug delivery method, a timetable for drug delivery, the place for drug retrieval, and monitoring the delivery of drugs to their communities [107]. Furthermore, health workers and district health teams were responsible for the development of social mobilization materials and training of CDDs.

Process

The Special Program for Research and Training in Tropical Diseases (TDR) Task Force for the elimination and control of Onchocerciasis and LF was made up of selected ministry of health disease focal points, academicians, the WHO, and representatives of several NGOs. In 2000 it commissioned a comparative study in Ghana and Kenya to evaluate two strategies for the delivery of treatment for LF: health system-delivered treatment where health workers treat communities like they would in a mass treatment programs, and community-directed treatment implemented by CDDs where communities lead and direct the design and

implementation of MDA under supervision by local health workers (WHO, 2000). The study, which was conducted between 1996 and 1999, revealed that community-directed treatment could be effectively implemented and results in high treatment coverage. It was also noted that CDDs would appreciate some form of incentives or compensation [100]. However, around this same period in India, it was determined that the delivery of treatment through the health system and by healthcare workers was the better approach compared to community-directed treatment [108].

In 2000, increased interest in supporting the WHO's GPELF and national programs led to the formation of the GAELF, which is a network and forum for partners to coordinate efforts and engage in advocacy to support GPELF. Under the concept promoted by GAELF, countries initiated and led all MDA activities while NGOs supported programs to fund and facilitate MDA activities. Public and private donors provided funding support to NGOs and academic institutions; pharmaceutical companies donated medicines; and academic institutions and the WHO Collaborating Centers conducted research to generate evidence leading to improved country strategies and evidence-informed WHO policies. The WHO kept its responsibility for developing policies and providing guidelines and trainings for elimination activities, coordinating the donation of medicines and diagnostics, and documenting global progress towards elimination.

A review of WHO documents and the peer-reviewed literature did not reveal evidence that monitoring, evaluation and sustainability studies around community engagement, compliance, and coverage during MDA were officially part of GPELF's community-directed treatment approach; however, a report of the second meeting of the GAELF included a reference to social mobilization. It was noted that the effective role of social mobilization in communities was well demonstrated through communication for behavioral impact in Zanzibar, Haiti, India and the Philippines [107]. This strategy was emphasized for countries where social barriers to MDA coverage existed; and it was suggested that training materials should be developed to facilitate social mobilization activities at the beginning of each national elimination program [107]. Furthermore, although numerous documents and peer-reviewed publications between 2002 and 2009 discussed the need for additional operational research, epidemiologic modeling, surveillance strategies and vector control, very

little emphasis was placed on the need to monitor and evaluate the community-directed treatment approach for LF, especially in sub-Sahara Africa.

Actors

The decision to adopt community-directed treatment for LF was made by WHO's GPELF and the TDR Task Force for the elimination and control of Onchocerciasis and LF [100]. Following the decision, the WHO and its partners trained ministry of health disease focal points on the planning and implementation of MDA, including the selection and training of CDDs [100]. In Kenya, disease focal points conducted cascade trainings at the regional, district and community levels.

LF control in Kenya

Kenya established its LF elimination program in 2001. Community-directed treatment for LF was launched in Kilifi district in 2002 and expanded to Kwale and Malindi districts in 2003; however, between 2005 and 2008, the national program did not use this approach due to financial constraints [28]. Under the program, community members selected CDDs, but did not play any other roles in the implementation of the community-directed treatment approach. In 2009, TDR through the African Population and Health Research Centre in partnership with the International Development Research Centre and Ford Foundation funded a study on MDA compliance in two coastal districts in Kenya. Findings revealed that individuals in low compliance areas disliked the house-to-house distribution method, which were significantly associated with their perception that CDDs failed to explain the importance of the medicines and related side effects [28]. Some participants also felt that they often waited for CDDs for long periods of time, and did not have positive interactions with CDDs. Also, CDDs left drugs for individuals that were not home, did not have good communication skills, were perceived to 'overdose' community members and were strangers to the communities (Njomo et al., 2012). The study also found that most of the CDDs were selected based on having served as volunteers for other community health programs rather than for their familiarity with communities (Njomo et al., 2012). Half of the CDDs interviewed felt there was no transparency in the selection process. Opinion leaders and community members emphasized that CDDs should be residents of communities to reduce non-compliance [28]. CDDs felt that their training was short and too rapid, that they had received an insufficient supply of medicines, and did not have enough time to cover

their assigned households and summarize and submit reports [28]. In addition, health workers complained of not having enough time to plan MDA. The national program cited funding as the main barrier to recruiting additional CDDs and conducting effective social mobilization campaigns. Further, CDDs only received incentives to attend training, and expressed their desire to have special T-shirts in order to be easily identifiable by community members and feel appreciated [28]. Similar challenges were also identified by studies conducted in India and Haiti at the time [109–111]. Additional studies to evaluate the community-directed treatment approach in Kenya were not conducted and published until 2018. As a result, MDA approaches were not generally adapted for subsequent rounds to achieve higher coverage. Anecdotal evidence suggests that given the strong emphasis on parasitology and assumption that the free distribution of life-saving medicines would result in automatic community acceptance of MDA, social and behavioral influences on coverage and compliance and related interventions were not prioritized in implementation research.

Following intermittent MDA in only very few areas in 2002, 2003, 2005, and 2008, Kenya, with the help of partners and the WHO, restarted MDA for LF in 2016 [85]. Between October 2016 and November 2017, large randomized controlled clinical trials conducted by the Death to Onchocerciasis and Lymphatic Filariasis (DOLF) Project revealed that combining ivermectin, DEC, and albendazole in areas not co-endemic for onchocerciasis and LF were safe, acceptable, and effective for accelerating LF elimination goals [112]. In comparison with the two-drug regimen, ivermectin, DEC, and albendazole (IDA) is more difficult to administer because it requires reaching a greater proportion (80%) of at-risk individuals with treatment, but requires less repeat MDA rounds. On the other hand, the two-drug approach is considered effective with coverage of at least 65% for five or more repeat MDAs.

In 2019, the Bill and Melinda Gates Foundation selected Kenya to pilot the use of the triple drug regimen for LF during the 2019 MDA campaign. Although Kenya has four counties (Kilifi, Kwale, Mombasa, Lamu) that require MDA for LF [85], only one urban area in Mombasa county and two rural settings in Lamu county that are hard-to-reach were included in the pilot IDA MDA. Some actions taken to achieve high coverage and compliance in these areas included tailoring messages for non-compliant groups, leveraging trusted individuals to deliver information about MDA and LF, utilizing a

diverse range of platforms for drug delivery, such as popular public venues, factories, home visits, and hard-to-reach areas, increasing supervision and recruitment of additional CDDs, maintaining strong performance in trainings and supply chain management, and ensuring the timely receipt of medicines and MDA materials by CDDs before the MDA start date. In addition, various international and national partners provided significant financial and technical support to the government of Kenya, sharing the common vision that the pilot IDA MDA was unprecedented in the world and required significant programmatic improvements to achieve coverage of at least 80%. With renewed commitment and funding from the WHO, the Bill and Melinda Gates Foundation, government institutions, and NGOs, Kenya successfully planned and implemented MDA with the triple drug therapy, achieving coverage of 87%. It is expected that Kenya will soon achieve its elimination goals, and share lessons with other countries.

Discussion

The global policy to use the community-directed treatment approach against LF has undoubtedly avoided the loss of a high number of disability-adjusted life years and helped numerous countries to progress towards elimination of LF. Despite the recent notable achievements during its first IDA MDA, Kenya may face challenges to sustain the momentum, funding, and fidelity to IDA MDA strategies that would help it achieve effective coverage during subsequent MDAs. Further, as IDA MDA will be expanded to cover other endemic areas, the government of Kenya will require additional financial and technical support in order to achieve effective coverage. Funding will also be required for understanding barriers and facilitators of effective coverage in other areas in order to plan and implement MDA successfully. A study conducted in Kilifi and Mombasa counties just before the pilot IDA MDA showed that both areas continue to experience challenges with low coverage and non-compliance due to factors like the ineffective engagement of CDDs and communities during MDA planning and implementation [44].

This is the first study to retrospectively analyze the policy development and implementation processes for community-directed treatment to deliver medicines to at-risk groups. The development and implementation of a policy, in response to an emerging need, requires careful assessment of the social, political and economic context, the use of evidence, engagement of relevant stakeholders, leadership for

policy implementation, planning and resource mobilization, operations and services, and feedback on the progress and results [113]. While we found that evidence from a multi-country study directly led to the adoption of the community-directed treatment approach, we also noted a gap between policy and practice. In addition, this case study focusing on Kenya revealed that, although an initial feasibility, acceptability and sustainability study had been conducted to inform the adoption of the community-directed treatment approach for LF, monitoring and evaluation studies across endemic countries were only conducted until approximately eight years later. Even when country evaluation studies were conducted before 2010, they were few (India and Kenya); limited to one to two districts per country, and did not always apply frameworks and indicators explored in the initial multi-country study. This may have been due to limited funding and the neglect of the socio-cultural influences on coverage and compliance during MDA. The evidence from this study also shows that there were expectations that communities would readily accept and ingest medicines that were provided to them at no cost. This expectation may have led to a failure to adequately prepare Kenya for challenges associated with implementing the treatment approach. These challenges led to low coverage and compliance in communities and that CDDs were not always selected from their communities, incentivized and adequately trained [28, 84]. This poor program performance over a long period of time may have also resulted in some fatigue among the government of Kenya and international partners, leading to limited financial investments in campaigns.

Given that communities and countries have evolved geographically, socially, politically and economically, and grown in population size since the development of the policy, adopting the community-directed treatment approach requires consideration of the conditions under which the approach should be implemented. Many urban areas seen in Africa today were rural areas when the community-directed treatment approach was introduced. Thus, the original door-to-door delivery strategy may now result in low coverage and compliance in some areas because drug distribution is conducted during hours that many residents are at work or in large public spaces. Also, rural communities were set up in ways that allowed everyone to be familiar with other residents and CDDs, which facilitated supervision, mobilization, and sensitization of community members. Community members knew each other and community leaders were revered as individuals with cultural, legal, or social power, suggesting that when community leaders accept MDA and the NTD

program, community members would participate in MDA or experience social sanctions for non-compliance. Furthermore, the community-directed treatment approach was implemented in Kenya at a time when its primary healthcare system was still not fully reformed after colonial rule. Thus, there were very few actionable strategies, centralization, limited intersectoral collaboration, and low community participation in health [68]. Since MDA started in Kenya, the health system has been devolved, shifting the operationalization of the delivery of health services from the Ministry of Health to counties. While this shift has created an equal playing field for county governments, it has in some instances negatively impacted the effective and efficient delivery of health services to those that need it most. The interesting finding in this study that India adopted a health system approach to drug delivery is corroborated by evidence showing that vertical programs like country NTD programs further weaken health systems, and that a systems approach is needed to sustain the gains of NTD programs and motivate CDDs [17, 114, 115].

MDA is an annual event that lasts between 5-10 days and is executed like other routine health campaigns with interlinked activities, such as planning, training, procurement and storage of medicines, registration of households, social mobilization, drug distribution and management of adverse effects, data collection and reporting, monitoring for quality assurance and coverage surveys. Consequently, MDA engages many components of the health system, including but not limited to governance and leadership, human resources for health, health financing, health information systems, service delivery, and supply chain management [116]. When countries are constrained by insufficient funding and management capacity, limited human resources, and poor governance, the achievement of program targets is in jeopardy [17, 44]. The use of CDDs in NTDs for other public health activities, and improved coordination between various health programs, can reduce the pressure on health systems [117]. With countries that have implemented over five rounds of MDA and haven't achieved elimination, both health workers and CDDs are likely experiencing frustration and fatigue [17]. Can Kenya find a balance between the health system and community-directed treatment approaches to accelerate impact? Today, there are opportunities to reform and consider the adaptation of the community-directed approach in Kenya to sustain the gains made by the NTD program. The strong collaborations between social science research, the WHO, and country programs in recent years also present an opportunity to use new evidence

and implementation science principles to reform the community-directed treatment policy. Furthermore, the WHO has the responsibility of aligning the agendas of various stakeholders to reflect country needs and harmonizing collaborations, which facilitate country ownership of the elimination of LF. At the global level, the WHO can convene experts to examine the new evidence for the community-directed treatment approach and promote its adaptation as needed. Additional implementation research is also required to draw definitive conclusions about the barriers and facilitators of the integration of MDA into the health system and sustaining the motivation of CDDs. Also, an in-depth understanding of the challenges coupled with advocacy and innovation at all levels of the health system can lead to significant impact. In order to achieve effective coverage during each treatment round to interrupt transmission of LF, strong and resilient health systems in endemic countries are needed to successfully, efficiently and effectively execute MDA to deliver medicines in rural, remote and hard-to-reach areas where access to healthcare is a challenge [104, 118].

There are several limitations to this study. First, additional interviews with key stakeholders would have helped to validate and triangulate information gathered from document reviews. This was not done due to challenges with making contact with individuals that have first-hand knowledge of the development and initial implementation of the community-directed treatment approach in 2002. However, discrepancies across documents, and between documents and anecdotal evidence were not found.

Conclusions

Financial, human, and technical resources from multiple partners are important to adapt the community-directed treatment approach to the local context and make program enhancements to achieve effective coverage. In order to sustain the gains and ensure successful MDAs in the future, the government of Kenya will need to secure funding and technical support at the national and international levels, and adopt strategies that proved successful. More generally, this retrospective policy analysis could help to galvanize discussions around resource mobilization and highlight the critical role that WHO plays in driving the health policy agenda.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
All authors have provided consent to publish this material.

Availability of data and materials
The dataset supporting the conclusions of this article is available on request from the lead author.

Competing interests
The authors declare that they have no competing interests.

Author contributions
CK: conceived and designed the study. CK: collected data. CK: analyzed data and drafted the manuscript. PS and SM: contributed to interpretation of findings and revised the draft manuscript.

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The Fight against lymphatic filariasis: Perceptions of Community Drug Distributors During Mass Drug Administration in Coastal Kenya

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Abstract

Background: Lymphatic filariasis, a NTD and leading cause of global disability, is endemic in 32 countries in Africa with almost 350 million people requiring regular drug administration, and only 16 countries achieving target coverage. CDDs are critical for the success of NTD programs, and the distribution of medicines during MDA in Africa; however they could also be a weak link. The primary aim of this study is to explore and describe perceptions of CDDs during MDA for LF in Mvita sub-county in Mombasa county and Kaloleni sub-county in Kilifi county, Kenya; and provide recommendations for the effective engagement of communities and CDDs in low-resource settings.

Methods: Over a 1-month period in 2018, we conducted six focus group discussions with community members in each sub-county, three with men aged 18–30, 31–50, and 51 years and above and three with women stratified into the same age groups. In each sub-county, we also conducted semi-structured interviews with nine CHEWs, the national LF focal point, the county NTD focal points, and seven community leaders. Content analysis of the data was conducted, involving a process of reading, coding, and displaying data in order to develop a codebook.

Results: We found that several barriers and facilitators impact the engagement between CDDs and community members during MDA. These barriers include poor communication and trust between CDDs and communities; community distrust of the federal government; low community knowledge and perceived risk of LF, poor timing of MDA, fragmented supervision of CDDs during MDA; and CDD bias when distributing medicines. We also found that CDD motivation was a critical factor in their ability to successfully meet MDA targets. It was acknowledged that directly observed treatment and adequate health education were often not executed by CDDs. The involvement of community leaders as informal supervisors of CDDs and community members improves MDA.

Conclusion: In order to achieve global targets around the elimination of LF, CDDs and communities must be effectively engaged by improving planning and implementation of MDA.

Background

Neglected tropical diseases affect more than two billion people around the world, causing disability and death in vulnerable populations [12]. Thirty-two of the 52 countries that require preventive chemotherapy are in Africa, and almost 350 million people in Africa require regular drug administration. Only 16 countries in Africa achieved target coverage [119]. LF is one of five NTDs whose transmission cycle can be interrupted through annual large-scale distribution or MDA of preventive chemotherapy. In Africa, MDA campaigns usually rely on CDDs.

Today, CDDs are critical for the success of many NTD programs, and the achievement of current global targets for the elimination of diseases like LF and onchocerciasis; however they could also be a weak link [19, 20]. Studies conducted in several African countries have shown the factors that jeopardize the sustainability and success of community-directed treatment programs, as well as the barriers and facilitators of coverage and compliance, including the motivation and performance of CDDs. A study profiling the best performing CDDs in Uganda demonstrated that treatment rates were associated with CDD characteristics rather than the willingness of community members to comply with treatment [120]. In some contexts, the selection and recruitment of CDDs are not led by the community or made transparent, resulting in community resistance and lack of trust of CDDs [23, 84]. A study conducted in Ethiopia found that CDDs had poor knowledge, attitude and practices related to onchocerciasis, leading to low participation of community members in MDA [121]. In Tanzania and Nigeria, researchers showed that CDDs did not understand the cause and transmission of the disease due to inadequate trainings. As a result, CDDs passed on wrong information to community members about LF, impacting community trust of CDDs [23, 45]. Also, CDDs in Northern Nigeria did not understand how to engage with individuals with physical disabilities and other complex conditions due to inconsistencies in messages during trainings [45].

Community drug distributors' preferences for financial and material incentives, and their effect on motivation, are important factors in the implementation of MDA campaigns. In a study conducted in Uganda, Fleming and colleagues found that CDDs were driven by both intrinsic and extrinsic motivations. They were motivated to serve their communities and gain recognition; and also desired financial and material incentives, such as T-shirts, bags, hats, boots and waterproof coats with the program

logo and certificates [26]. They also felt that financial compensation should reflect out of pocket expenses and opportunity costs incurred during MDA [26]. Opportunity costs can include missing out on farming and other small-scale ventures, as well as household food and school costs [26, 122]. In Ghana and Nigeria, CDDs preferred certificates, T-shirts, bicycles, ID cards, hats, preferential treatment at the district hospitals or health centers as compensation for their work [45, 122].

CDDs have reported that the support given by communities and the NTD program is not enough motivation [26, 45]. In Nigeria, Kenya and Ghana, CDDs expressed a desire to see their supervisors throughout MDA in order to increase their confidence and promote community acceptance of MDA [45, 84, 122]. The lack of supportive supervision of CDDs is often due to the high workload of supervisors during MDA campaigns and the provision of routine health services within healthcare centers [23, 122]. In Cameroon, CDDs working in the onchocerciasis program reported that low appreciation and community support affected their motivation [123]. Furthermore, in Nigeria, positive feedback from communities was a major motivating factor, resulting in feelings of happiness and fulfillment for CDDs. Also, supervisors and CDDs wanted more feedback and appreciation from the health sector, and to be acknowledged as contributors to population health [45].

In addition, CDDs' workload during MDA also impacts their motivation and performance. In Tanzania, CDDs mentioned that they did not receive adequate time in order to achieve their performance goals [23]. In Nigeria, high attrition among CDDs resulted in high workload for the remaining CDDs, resulting in low motivation and disengagement [45]. In India and Ghana, CDDs reported difficulties with being able to deliver medicines in the time frame they were allotted [122, 124]. In efforts to achieve performance targets, CDDs are not compensated for the extra time they use to distribute medicines [23].

Furthermore, CDDs have reported a lack of resources and medicines to be able to perform well during MDA. In Uganda and Nigeria, researchers found that drug stock outs due to inaccurate census, insufficient transportation, bags to carry program documents, clean water for ingesting medicines, and insufficient quantities of registers and measuring sticks impacted the on-the-job experiences of CDDs [26, 45].

The inability to properly store and dispense tablets, and offer communities treatment for drug side effects also hinder CDDs' work [26, 27].

Although studies have contributed to our understanding of the many challenges that demotivate and disengage CDDs and communities, additional evidence is needed to identify pathways for improving and sustaining the motivation of CDDs and engagement of communities. A systematic review of the factors influencing the motivation of CDDs concluded that there is a need for more research on measures that improve CDD motivation within the context of the local health system and changing sociocultural environment [17]. The investigation of the perceptions of CDDs can reveal the measures and pathways needed to better equip and engage CDDs.

The Kenyan Context

Evidence for the engagement of CDDs for the elimination of LF in Kenya is limited. Findings from studies conducted over five years ago in Kenya indicate that lack of supervision, lack of community trust in CDDs, inadequate training for CDDs and CDDs' inability to reach households resulted in low coverage and compliance [28, 84]. Given the changing socio-cultural and economic landscape of countries like Kenya, and recent efforts to deliver multiple combinations of medicines to accelerate the elimination of LF, there are added pressures on CDDs to not only meet the demands of the NTD program, but also those of their families and communities. The NTD community needs a better understanding of how the roles, perceptions and job experiences of CDDs have changed in Kenya amidst new and intensified global, national, sub-national commitments and agendas. This new understanding can inform the development and implementation of recommendations, and ensure that no one is left behind.

Methods

Research Design

This qualitative study used semi-structured key informant interviews and focus group discussions. Semi-structured interviews were conducted with community leaders, CHEWs, and NTD program officials at the county and national levels. CHEWs are formally trained health care workers responsible for supervising CDDs during MDA.

Focus group discussions were conducted with community members. The aim of these interviews was to explore the perception of CDDs during MDA.

Setting

The study was conducted in September 2018 in coastal Kenya in Mvita sub-county, an urban area in Mombasa county, and Kaloleni sub-county in a rural area in Kilifi county. Two sites with coverage below the treatment threshold of greater than or equal to 65% in the two MDA rounds preceding this study were selected to compare differences and similarities in perceptions of CDDs. In 2015 and 2016, Kaloleni sub-county achieved coverage of 61% and 58% respectively, and in 2016 and 2017, Mvita sub-county achieved coverage of 51% and 59% respectively.

Data collection

Focus groups

We conducted six focus group discussions with community members in each sub-county. Three focus groups were conducted with men aged 18–30, 31–50, and 51 years and above and another three with women stratified into the same age groups. We hypothesized that there may be differences in perspectives by stratum. The sub-county NTD focal point worked with community leaders to purposively select participants for the focus group discussions. Community leaders were asked by the focal point to contact individuals that resided in the community, present at the time of the study and most recent MDA, were over the age of 18, and were willing to come to a specified location and time the following day for an interview. The first 48 individuals to answer leaders' calls and agree to participate were included in the study as participants. Community leaders informed participants about the location, day, and time of the interviews. In each sub-county, two trained public health interns from nearby health facilities moderated the focus group discussions, with one moderator assuming the role of note taker. The total number of participants in each focus group was eight. The focus group discussions were conducted in a private room, at either the railway dispensary or sub county health center. The venues were chosen based on the convenience for the participants. The discussions were conducted in KiSwahili, the national language of Kenya, and lasted for approximately 75 minutes. A topic guide was used to facilitate discussions.

Semi-structured interviews

In each sub-county, nine CHEWs and seven community leaders were purposively selected and interviewed. The county NTD and national LF focal points were also interviewed. Participants were identified and recruited by a sub-county NTD program official, and were 18 years of age and above and participated in the most recent MDA. In each sub-county, two trained public health interns from nearby health facilities conducted the interviews. The interviews took place in a private room at the closest health center or in the participant's home, and lasted for approximately 60 minutes. The interviews, conducted in KiSwahili, explored a range of topics related to CDDs and community experiences during MDA.

Quality Control

In order to ensure data quality and optimization, interview guides were translated from English to KiSwahili and KiSwahili to English in order to reconcile discrepancies and differences. One of the authors and a senior research assistant that spoke KiSwahili supervised all interviewers to ensure that interviewing and data capture techniques were adhered to. After interviews, interviewers reviewed and added to their notes, and uploaded recordings to the cloud. Interviewers transcribed recordings into English at the end of each day. The senior research assistant randomly selected two recordings and transcripts from each interviewer to ensure consistency between recording and transcription.

Data analysis

Interviews with forty-eight focus group participants, eight CHEWs and six community leaders in each sub-county were digitally recorded and transcribed verbatim. Transcripts were translated to English, reviewed, and then manually coded. Content analysis of the data was conducted [125], which involved a process of reading, coding, and displaying data in order to develop a codebook. Members of the study team read a subset of transcripts and coded emerging themes, reviewed coding, and refined the codebook through an iterative process until consensus was reached between the authors. In order to reach consensus, analyses, codes and themes on the same text were compared to examine similarities and differences. Where there were differences, we actively re-read the text and discussed perspectives. This iterative process consisted of the integration of both deductive and inductive methods to identify predetermined and emergent themes [125]. Predetermined themes were

based on the study objectives, and included community engagement with CDDs, NTD program engagement with CDDs and CDD motivation and remuneration.

Ethical considerations

Informed consent was obtained from all study participants, including consent to digitally record interviews. This study was reviewed and approved by the Kenya Medical Research Institute Scientific and Ethics Review Unit, and a waiver was obtained from the Ethics Committee of Northwest and Central Switzerland, approval number 2018-00694.

Results

A total of 10 themes emerged from the data (Table 1). They are classified into three groups: themes, sub-themes, and perspectives. Sub-themes and perspectives did not differ by age and gender.

Table 1. Perceptions of CDDs

Themes	Sub-Themes	Perspectives
Communication between CDDs and the community	CDDs hurriedly distribute drugs, resulting in little to no health education.	Adequate health education enables community members to understand LF as a disease with devastating outcomes. Once this is understood from CDDs, they are more likely to participate in MDA and ingest medicines.
Qualities of good CDDs	Trust is established between CDDs and communities when CDDs are nominated and selected by their community.	When trust is established, CDD interactions with community members are positive. As a result, community members are able to trust information from CDDs about the importance of MDA and ingesting medicines.
	CDDs that are perceived to	Conversely, when CDDs are not

	behave well and have a good image are desirable.	trusted, community members are hostile and refuse medicines. CDDs must be known and selected by their community in order to achieve their goals during MDA. CDDs that are not only selected by community members, but are also well mannered and respectful are embraced and trusted.
Community resistance toward CDDs	Community members' distrust of CDDs often led to sharp resistance and negative treatment of CDDs.	Drug misconceptions stemming from cultural beliefs, political propaganda, and lack of awareness fuel resistance to MDA and CDDs in the community.
Community distrust of the federal government	Community members perceive that the government is motivated by a political agenda, and that MDA is the platform used to advance their harmful agenda.	Community members perceive MDA to be a way for the government of Kenya to enforce family planning. This misinformation results in a lack of participation in MDA.

CDD motivation	Community members perceive that CDDs are motivated when they feel appreciated by them.	When communities are receptive to the health information, look for CDDs to obtain the drugs, encourage their neighbors to accept the drugs, and provide water, airtime and food, CDDs often feel appreciated. Monetary incentives also serve as motivation for some CDDs to perform well, especially those who are unemployed. Nonetheless, the primary motivator for volunteering among CDDs is their commitment to serve the community.
Perception of MDA as a distribution strategy	Community members that perceive that drugs should be distributed in private facilities or hospitals often don't participate in MDA and belong the higher income groups. On the other hand, those in the lower income groups embrace MDA.	CDDs find it challenging to reach those in higher income levels because they perceive that access to medicines should be from private doctors and hospitals in the event that they do fall sick. This perception may suggest that LF is a disease associated with poverty and that CDDs are not qualified to offer them medicines.
Timing of MDA	The period during which CDDs distributed medicines has an impact on coverage.	Some community members are frequently absent during MDA because of work, travel or school.

Community accountability during MDA	Community elders often help achieve treatment coverage through indirect supervision of community members and CDDs during MDA.	Community leaders serve as informal supervisors by addressing troublesome community members and by encouraging them to accept and ingest medicines.
CDD bias	CDDs purposively decide which individuals and groups would receive medicines, which impacts treatment coverage.	Community members believe that CDDs should offer drugs to everyone and not those they like.
Community understanding of CDD job responsibilities	CDDs are expected to engage in a variety of activities before, during and after MDA.	Directly observed treatment, health education prior to MDA, dosage assessment, and mop-up are all responsibilities of CDDs. Community members report forgetting to take the drugs when CDDs left the drugs, without implementing directly observed treatment.

Focus group discussions

Participants shared that LF is caused by mosquitoes, and manifests as swelling of legs, scrotum and breasts. They also expressed that LF can be controlled with drugs and using mosquito nets at home. The reasons cited for risk of LF included poor waster disposal, being near the ocean and the presence of mosquitoes. Only one focus group participant reported that worms caused LF. Perception of risk for LF was high among focus group participants. Acceptance of LF medication during the last MDA varied among the groups. There were some observed differences by age and gender among those that reporting having taken the drugs and those that did not.

Semi-structured interviews

In each sub-county, five out of six community leaders reported incomplete primary school education, and all CHEWs had at least a secondary school degree. Most participants identified themselves as Muslim.

Communication with CDDs

Some participants indicated that lack of knowledge of LF and MDA made it difficult for them to accept CDDs and the medication. Mainly, they expressed a lack of effective communication with CDDs influenced their decision to accept medicines. In addition, CDDs are often in a hurry and don't provide adequate explanations about medicines.

Some have bad approach to the community. Some are in hurry and therefore don't explain the usage of drug and why are people being given drugs. (FGD, men, 30–50 years old)

Some CDDs teach us in a way we don't get to understand the message. Some people are slow learners. (FGD, women, 50 years and above)

Qualities of a good CDD

When participants discussed qualities of a good CDD and how CDDs were selected, they consistently reported the importance of CDDs' relationship with the community. Focus group discussions and interviews with CDDs and community leaders revealed that CDDs that were from the community or those that were well known among community members were trusted and accepted. Furthermore, participants described how a trusting relationship between the community and CDD made it less challenging for CDDs to gain access to the households to distribute medicines.

The community give me positive feedback about them, they say that they are respectful and they interact well with them. Their relationship is good because they all come from the same community and have a good understanding with each other. The community is welcoming to them because they know each other. (Elder, woman, 63 years old)

On the other hand, CDDs that are not selected by community members will not be given the opportunity to distribute medicines because they are not trusted.

…We have never seen them in the community that's why it's hard for some to accept the drugs. I would trust someone from within the community more than strangers. (FGD, women, 18–30 years old)

Participants mentioned that CDDs were chosen to volunteer for MDA based on their relationship with the community, work history, and ability to perform the job tasks (e.g. climbing tall buildings). Several participants suggested that CDDs that were well mannered, respectful, trustworthy, and had a good reputation were well received by the community. Participants also mentioned that patience was an important quality for CDDs to possess because they endured a great deal of resistance from the community.

Like I told you, we don't choose people if they have a bad image, unless that person has good relations with the community that's when our work also becomes easier because already there is a connection. If a CDD is not respectful then there wouldn't be a good relationship. (Elder, man, 54 years old)

Community resistance toward CDDs
Over 20 interview participants expressed the view that CDDs endured harsh treatment from community members during drug distribution. Experiences of harsh treatment included being chased away, having doors slammed in their faces, and encountering insults.

You know people can't be the same, sometimes a CDD could knock at the door but they don't open or when they open they become harsh, abusive and bang the door at your face. (Elder, woman, 64 years old)

Community distrust of government
The most common drug misconceptions reported by participants included that drugs were not safe and intended for promoting family planning.

Many people have lost trust with CDDs because some think its political, there is

some registration that goes on before the MDA, people think it is connected to politics that there may be rigging of elections. Some believe it's a way that the government is using to reduce the population, a way of family planning. (FGD, women 50 years old and above)

There is a challenge because you know there is the rich, poor and middle class. The rich have problems, they have the attitude that they are being given family planning drugs, not opening the doors or if they do, then they insult you. (CHEW, two years of experience)

Perception of MDA as a distribution strategy

Participants also mentioned that some community members, primarily the higher class, did not accept the drugs because they prefer to be treated in a hospital or by their own private doctors.

Some people chase the CDDs away saying they have their own private doctors that they can go to in case of any medication. (Elder, man, 50 years old)

It depends on the community, you find that some of these people that are in the middle and high-income level, feel that MDA is beneath them. They feel that they can access better services in private facilities, but you find that in the informal sectors and low income earners, they embrace the MDA in fact they ask for the medicines. So there is always this disparity between the high and low-income earners. (CHEW, two years of experience)

CDD motivation

Elders and community members shared that they believed that CDDs were more motivated when they felt appreciated and supported by the community. They also felt that CDDs appreciated it when community members received them well, were receptive to the health information, and accepted the medication. Participants also shared the view that CDDs felt appreciated when community members looked for them to obtain the drugs, as well as encouraged their neighbors to accept the drugs. Several participants described instances when community members expressed gratitude and provided CDDs with resources such as water, food, and airtime.

In some households they express their appreciation by providing water, milk or refreshments considering the fact that they are not provided these things during the MDA is something positive for them. (Elder, man, 50 years old)

Yes I feel they are rewarded and appreciated because we listen to what they have to tell us and accept what they have to offer. We also respect them for that. (FGD, women 18–30 years old)

Community members and leaders indicated that extrinsic rewards, especially the monetary incentive, served as a significant motivator for CDDs.

Some CDDs do the job as a source of income, so their motivation is the money they get after the job. So many of us are unemployed. (FGD, women, 18–30 years old)

Community level accountability
Some participants suggested that community leaders served as informal supervisors. Community leaders accompanied CDDs in the field and ensured they performed their duties. Several participants also described how community leaders assisted CDDs when they faced resistance in the field. Community leaders were crucial in helping CDDs gain the trust of the community. Participants also discussed how community leaders supported CDDs by helping to dispel misconceptions about the drugs and assisting with difficult community members.

Other people refuse the drugs when given by other CDDs unless they see me. When I show up they calm down and accept. (Elder, woman, 64 years old)

Incitement among the community members, some spreading negative news about the medicines that's why village elders are involved to convince the community that the stories are not true. They believe in us even more than the sister or nurse accompanying us because they don't have enough interaction with the community. (Elder, man, 50 years old)

Timing of MDA
Focus group and interview participants discussed the issue of participants not being available during MDA. The reasons for community members' unavailability during the

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MDA included work, school, and travel. This resulted in low coverage, especially when CDDs did not return to the household.

The problem was time factor they want to distribute the drugs during the day and that is the time when most people are at work. Supposed they were doing it at night, when we are all at home in the evening or at night then all of use would have taken medicines. (FGD, men, 30-50 years old)

CDD bias
For focus group participants, some CDDs are biased when distributing drugs so that community members are not offered the medicines.

They should be able to give drugs to all not denying others. (FGD, men 30-50 years old)

Community knowledge of CDD job responsibilities
The majority of participants mentioned that CDDs were expected to distribute drugs door to door, provide education on LF and the importance of drugs, and administer the proper dosage. Several participants expressed that CDDs were expected to perform directly observed treatment, without force, and to follow up with missed clients to ensure all households are met.

Before the MDA, the CDDs come to inform us after which they distribute the drugs. After the MDA, I see the CDDs coming around to check on those who had missed out on the drugs. (FGD, women, 18-30 years old)

Participants pointed out that some CDDs left the drugs for household members that are not around at the time of distribution or allowed household members to ingest the drugs later. Several focus group participants reported that some community members did not take the drugs because they forgot to take them later or they disposed of them instead.

"You see some CDDs bring the medicine but do not wait to watch someone swallow. They just give and go so in that case they don't swallow. (FGD, women 30-50 years old)

Interviews with the national LF focal point and county NTD focal points revealed similar themes around barriers and facilitators of implementing successful MDA campaigns. First, the program's limited financial resources for MDA lead to inadequate pay for CDDs, as well as high workload given the limited number of days allocated for MDA. In addition, treatment coverage is often affected by individuals' strong cultural and religious beliefs around LF and the purpose of the medications. For example, Muslim husbands might prevent their wives from ingesting drugs because of their fear it may result in infertility. Furthermore, perceptions around the causes of LF are informed by cultural beliefs passed on from generation to generation, making it difficult for some communities to participate in MDA. Given Kenya's political challenges over the last decade, many communities have a deep lack of trust for government programs and initiatives. The focal points agreed that more resources are needed to better educate communities about LF, gain the support of community leaders, develop additional fixed posts for distribution of medicines, improve supervision of CDDs, access hard-to-reach areas, and motivate CDDs to achieve their MDA targets.

Discussion

The current study systematically examines perceptions of CDDs from the perspectives of multiple stakeholders in coastal Kenya. The use of qualitative research methods is effective in exploring the meanings of social phenomena experienced directly by the individual, resulting in the collection of detailed, rich information [126]. The findings suggest that gaining community acceptance and trust, as well as being selected from their own communities, impact CDDs' ability to reach household targets, as well as end users' decision to ingest medicines. In Cameroon and Uganda, CDD connectedness to the community was also emphasized among study participants as a major deciding factor on whether or not community members received CDDs and accepted the medicines [15, 123]. Additionally, CDDs that are well-mannered, patient, effective communicators, and knowledgeable are well received by the community and perceived to perform well on the job [26]. In our study, CDDs were not accepted or trusted due to poor community awareness of MDA, cultural and religious beliefs, and political propaganda. These findings are consistent with those of Ames et al., 2019 and Ahorlu et al., 2018 where community trust and selection of CDDs positively impacted treatment coverage [25, 27]. Participants also

suggested that signs of appreciation from community members, such as provision of water and warm reception encouraged CDDs, whereas encountering hostile community members often discouraged them. Another relevant finding was around community distrust of the government. Participants shared that they believe MDA is the government's attempt to promote family planning. Odour has studied the integrity in public health sector service delivery among the population in Busia County, Kenya. Findings indicated that 68% of the respondents were of the opinion that corruption in the public health sector was a very serious problem. Respondents reported corruption practices, such as harassment from providers, extortion, absenteeism of providers and informal payments required for treatment [127]. Corrupt practices within the health system may fuel community distrust of the NTD program, including CDDs.

The negative perception of MDA as a distribution strategy among higher income individuals was another interesting finding. These individuals feel that they have no symptoms, and therefore, do not have a need to ingest medicines. They also do not find it appropriate to ingest medicines provided by CDDs given that they have access to private doctors and hospitals. However, individuals in the lower income classes embrace MDA. This suggests that higher income individuals may associate LF with poverty, do not trust the NTD program, and have limited awareness of LF and the importance of MDA. Lymphatic filariasis often affects the socially marginalized and poor due to lack of use or access to mosquito nets. In addition, morbidity and disability due to LF significantly reduce economic output and increase poverty [106]. The lack of education and awareness, which may suggest a communication challenge with CDDs, around MDA and LF has been well documented. A study conducted by York et al., 2014 found that lack of awareness and education around LF was observed in both community members and CDDs [128]. The findings also suggest that the timing of MDA affects CDDs' ability to distribute drugs to community members and to reach targets. Brieger 2000 found that community members did not respect the volunteers' time, approaching them at any time of the day [129]. Furthermore, they were often absent during distribution, requiring the volunteer to visit again. This is because most people may be at work or traveling. Chami and colleagues in Uganda have documented CDD bias during MDA. They found that CDDs were more likely to deliver drugs to individuals who trusted them for health advice and were influential in the community, which allows them to maintain their

own influential status [130]. This means that less privileged individuals were less likely to be offered treatment. Social bias from CDDs during MDA may also be due to lack of sufficient monetary incentives, distance between households, and limited resources. Finally, the role of community leaders as informal supervisors that address myths about MDA and support CDDs with drug distribution serves as an important facilitator for achieving MDA targets.

The findings of this study suggest that, even if medicines are available, community members may not accept them because of distrust of the government, poor interactions and communication with and between CDDs and communities, and lack of knowledge and awareness of MDA and LF. Social bias from CDDs and timing of MDA affect some individuals' ability to access medicines during MDA. Medicines must be located within reasonable reach of the people who should benefit from it. CDDs must also have the capacity, motivation, time and resources to distribute medicines relation to the size of the target population. In order for the NTD program in Kenya to achieve epidemiologic coverage, the different dimensions of effective coverage must be addressed. Table 2 below shows specific proposed solutions for improving MDA by theme and sub-theme. At the national level, the NTD program can enact policies that ensure that MDA is held at fixed posts, and in public spaces to increase access to medicines for all individuals. Furthermore, the roles of community elders can be clearly defined to reflect supervision, positive reinforcement and health education support during MDA. This will ensure that all elders across communities help to improve MDA and support CDDs in a uniform, systematic and impactful way. With a growing population and pressures to meet targets, CDDs may be required to distribute medicines to communities that did not select them; however, the local NTD program can actively work with community leaders to recruit CDDs on an ongoing basis and place them on standby. Pre-MDA activities at the national and local levels can include digitally based messaging that assures community members of integrity in the health system, government and service providers. CDD motivation can be sustained through supportive supervision and adequate training, incentives and resources. As concluded by Krentel and colleagues, implementing and testing solutions for improving CDD motivation should be done so through the health system for sustainability, and leverage novel approaches such as digital technologies to effectively engage communities [17].

The current study highlights not only the barriers to the successful implementation of MDA, but also the costs that CDDs bear in order to meet NTD program demands. It also highlights the importance of the careful choice of CDDs in the fight against LF, as well as the need for more detailed research. Future studies can include comparisons across CDDs in areas with high coverage and low coverage, and more in-depth exploration on CDDs' job-related experiences and their professional quality of life.

Table 3. Solutions to improve MDA

Themes	Sub-themes	Solutions
Communication between CDDs and the community	CDDs hurriedly distribute drugs, resulting in little to no health education.	• CDDs can be given an extra day for distribution or sensitization in order to provide adequate health education for communities. • CDD trainings can include modules that emphasize the importance of and justification for providing health education to households before administering medicines.
Qualities of good CDDs	Trust is established between CDDs and communities when CDDs are nominated and selected by their community. CDDs that are perceived to behave well and have a good image are desirable.	• Prior to the implementation of MDA, community leaders should be provided with a roster that lists all CDDs assigned to their community, and ensure that CDDs are known to and accepted by the community. This can be done during standing community meetings.

		• CDD trainings can include modules on expectations of community members for good behavior and image, and how to achieve that.
Community resistance toward CDDs	Community members' distrust of CDDs often led to sharp resistance and negative treatment of CDDs.	• Prior to MDA implementation, community leaders can hold a meeting or forum introducing CDDs and explaining their roles. During this meeting leaders can emphasize the importance of accepting MDA and medicines
		• Increase CDDs' knowledge of LF through adequate training before MDA
		• Provide CDDs with the job resources, aids and time they need to adequately conduct social mobilization activities before MDA
		• Community leaders and key popular figures can show community members that they have ingested medicines.
Community distrust of the federal government	Community members perceive that the government is motivated by a political agenda, and that MDA is the platform used to advance their	• Government leaders at all levels can join community meetings and record videos for various social media platforms to promote MDA and the importance of

	harmful agenda.	• ingesting medicines. • Government leaders can collaborate with celebrities to use digital media to build trust and assure the public that MDA and medicines are safe and important.
CDD motivation	Community members perceive that CDDs are motivated when they feel appreciated by them.	• Communities can pool resources like water and food, and provide it to CDDs during MDA. • During meetings with community members, leaders can encourage them to embrace CDDs, show them appreciation and help them where they can • The NTD program can ensure that program staff and supervisors are always within walking distance of CDDs to reduce out of pocket expenses on airtime and transport.
Perception of MDA as a distribution strategy	Community members that perceive that drugs should be distributed in private facilities or hospitals often don't participate in MDA and belong the higher income groups. On the other hand, those in the	• The NTD program can offer those in higher income groups the option of obtaining their medicines from health centers or their own doctors.

	lower income groups embrace MDA.	
Timing of MDA	The period during which CDDs distributed medicines has an impact on coverage.	• The NTD program can explore alternative dates for MDA, and ensure that CDDs have adequate time and resources to conduct mop-up. • The NTD program can explore distribution of drugs in workplaces, health centers and other fixed posts.
Community accountability during MDA	Community elders often help achieve treatment coverage through indirect supervision of community members and CDDs during MDA.	• Community leaders can serve as informal supervisors during MDA by conducting random checks on households and CDDs.
CDD bias	CDDs purposively decide which individuals and groups would receive medicines, which impacts treatment coverage.	• CDD trainings can include modules that emphasize the negative impact and consequences of overlooking certain individuals. • Supervisors can closely monitor the progress of CDDs during MDA, and ensure that daily targets are being met. Supervisor trainings should include modules of effective and supportive supervision of

		CDDs to reduce bias.
Community understanding of CDD job responsibilities	CDDs are expected to engage in a variety of activities before, during and after MDA.	• CDD trainings should emphasize the importance of directly observed treatment. • Community meetings held prior to MDA should include discussions around the responsibilities of CDDs.

One of the main limitations of the study is the purposive selection of study participants by the sub-county NTD program. In preparing for the study, we were expected to rely on the NTD program's community health liaison to identify participants, which may have resulted in a biased sample and respondents providing interviewers with socially desirable responses. The study could have been strengthened by conducting separate focus groups for community members that did not participate in the previous MDA and those that did.

Conclusions

The effective engagement of communities and CDDs in the fight against LF is critical to the achievement of national and international elimination goals. Given the introduction of new global targets and drug therapies, there are added pressures on NTD programs to deliver medicines to at-risk groups efficiently and effectively. Additional treatment rounds along with its associated enormous financial investments by donors may not be sustainable, threatening the effectiveness of NTD programs to efficiently and effectively deliver treatment to at-risk groups. In order to address these challenges, changes at both the macro and micro levels must take place. If the NTD programme in Kenya continues to achieve low coverage, they will have to continue to treat areas like Kaloleni and Mvita sub-counties, and possibly experience delays in achieving WHO targets. This also means that the country program will require additional financial, human, and biomedical investments in order to ensure that various stakeholders are effectively engaged. If country NTD programs are going to

be successful in maximizing resources, sustaining the gains made, and achieving elimination goals, it is imperative to tackle MDA challenges at all levels of the health system.

Declarations

Chapter 12: Manuscript 3 (Under Review-Oxford Academic; International Health)

On-The-Job Quality of Life and Performance of Community Drug Distributors Engaged in the Fight Against Lymphatic Filariasis: Results from a Mixed Methods Study

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Abstract

Background: The interruption of transmission of Lymphatic filariasis (LF) entails large-scale mass drug administration (MDA) of medicines delivered by Community Drug Distributors (CDDs). Previous research show that job-related stress and frustration significantly impact community health volunteers' professional quality of life, performance, and retention. We studied the relationship between on-the-job quality of life and CDD performance and retention in urban Mvita sub-county in Mombasa county and rural Kaloleni sub-county in Kilifi county, Kenya.

Methods: We conducted 24 in-depth interviews and 300 structured interviews with CDDs.

Results: CDDs with a higher household income and burnout score were more likely to have good performance. Furthermore, higher monthly household income resulted in better performance when secondary traumatic stress was low. An increase in burnout negatively affected the retention of CDDs. Semi-structured interviews with CDDs revealed that, although CDDs were intrinsically motivated to volunteer because they took pride in being able to help their communities, they experienced challenges that affected their performance and programmatic targets.

Conclusion: In order to achieve global targets for the elimination of LF, CDDs must be effectively engaged by improving their on-the-job quality of life, and providing incentives and support that promote high retention and performance.

Background

Lymphatic filariasis (LF) is a neglected tropical disease (NTD) that occurs primarily in poor communities, where access to preventive health services, basic sanitation, education, income, transportation, and protection from animals and insects that transmit diseases, are limited. As one of the leading causes of disability, LF is endemic in 52 countries, affects more than two billion people in the world, and accounts for over 2.8 million disability adjusted life years.[87]

Community drug distributors (CDDs) in endemic countries in Africa are volunteers supporting the distribution of drugs for LF treatment and prevention during mass drug administration (MDA) campaigns, either door to door, at fixed posts, or both. Drugs include diethylcarbamazin or ivermectin, and albendazole.[100] This treatment strategy has resulted in the aversion of more than $100 billion in economic losses and treatment of around eight billion people since 2000.[82, 104] However, a third of the population eligible for MDA still requires treatment, and noncompliance remains a barrier to achieving elimination targets.[25, 82] One of the factors associated with low coverage and noncompliance is the motivation and performance of CDDs. Studies conducted in Africa have shown that community resistance, high workload, time pressure, low knowledge of LF among CDDs and communities, out of pocket expenses related to MDA, dissatisfaction with financial and material incentives, limited supportive supervision, and a lack of resources to perform their jobs affect the motivation and performance of CDDs [23, 26, 27, 44, 45, 84, 121].

The World Health Organization (WHO) defines work-related stress as a pattern of physiological, emotional, cognitive, and behavioral reactions to extremely taxing aspects of work content, organization, and environment.[49] Globalization and changes in the nature of work have resulted in increased exposure to work-related stress in developing countries.[49] The globalization process has also resulted in an increased gap between the rich and poor, less protection of worker's rights, and increased demands of learning new skills, higher productivity, and time pressure.[131] Furthermore, Dagget and colleagues posit that there is a negative relationship between high levels of job-related stress and the occurrence of mental health illnesses and burnout.[132]

Individuals that help people as part of their work often endure positive and negative experiences that influence their professional quality of life (PQoL).[81] Helpers can be exposed to traumatic stressors associated with burnout, depression, fatigue, frustration, anger, anxiety, and posttraumatic stress disorder.[81] Conversely, helpers can experience positive feelings and situations where they feel good and esteemed to have the opportunity to care for others.[81] Sociologist Beth Stamm posits that the negative aspects of providing care are serious, and can affect an individual, their family and close others, the care they provide, and their organizations.[81]

Although there is limited research in Africa on occupational stress among community-based health workers, studies among health workers in the United States, South Korea, England, Belgium, Germany, the Netherlands and People's Republic of China have shown a negative relationship between work stress and retention.[133–136] Stressors include lack of organizational support, staff shortage, inadequate salaries, insufficient personnel to handle the workload, and poorly motivated colleagues.[133–136] Another study conducted in the People's Republic of China among rural health workers revealed that workers who were less than 41 years of age, received an income of $327–$490 per month, had low job satisfaction and high work-related stress were more likely to leave their jobs.[137] Low retention often leads to a shortage of workers and inability to meet demand for health services.

Kenya commenced MDA against LF and adopted the community-selected volunteers approach in 2002. In spite of this early start, MDA is still ongoing due to the ineffective engagement of CDDs and communities. A study conducted in 2009 observed high noncompliance in two areas of the coastal region.[28, 84] Factors associated with noncompliance included community resistance towards CDDs, short and hurried trainings for CDDs, and limited time for CDDs to cover their assigned households and prepare reports.[28, 84] A recent qualitative study conducted in coastal Kenya showed that community distrust of the government, timing of MDA, CDD bias against community members and the selection of CDDs by communities continue to affect the implementation of MDA.[44] In addition, the qualitative study showed that CDDs were motivated to volunteer when they felt appreciated by communities.[44] Similar challenges were also identified in Ghana, Nigeria and Tanzania.[23, 27, 45]

Although several studies have shown that CDDs become and remain volunteers to help their communities and obtain influential status, there is danger in underestimating their real value and the opportunity, out of pocket, emotional and physical costs they bear by virtue of participation in the NTD program.[17, 26, 27] Globally, few studies have examined the on-the-job quality of life among community health volunteers, and evidence about the relationships between programmatic and socio-cultural factors, on-the-job quality of life measures and CDD performance and retention in sub-Saharan Africa is limited. Thus, there is a need for a clearer understanding of the emotional, financial, physical and psychological demands of the work of CDDs during MDA and their impact on retention and performance in order to better equip, incentivize and support them. The prioritization of the on-the-job quality of life of CDDs in MDA planning and implementation is critical to ensuring that those at risk for LF receive treatment. To contribute evidence, we conducted a study to assess the relationships between Beth Stamm's PQoL measures and CDD performance and retention in coastal Kenya. This evidence can inform the development of innovative strategies that improve CDDs' on-the-job experiences.

Methods

Research design

Data for this mixed-methods study were collected through in-depth interviews and a questionnaire-based survey with CDDs. The aim of the survey was to quantify the relationship between PQoL measures and CDD performance and retention. In-depth interviews were used to triangulate and validate findings from the survey.

Measures

The PQoL-version five is a 30-item assessment that measures the impact of working on mental health and wellbeing among individuals who have experienced extremely stressful events.[81] Respondents rate items using a five-point Likert scale, where "one" indicates never and "five" indicates always.[81] The negative and positive aspects of one's work are represented by three constructs and measured by three subscales: 1) Job Satisfaction, 2) Burnout, and 3) Secondary Traumatic Stress. Burnout and Secondary Traumatic Stress broadly reflect 'the natural, predictable, treatable, and preventable unwanted consequences of working with suffering people.'[81] Job Satisfaction is defined as the positive effects derived from work that

involves helping people and provides a buffer when one experiences burnout or stress.[81]

Setting

The study was conducted in September 2018 in coastal Kenya in Mvita sub-county, an urban area in Mombasa county, and Kaloleni sub-county in a rural area in Kilifi county. In the two consecutive years preceding this study, Mvita and Kaloleni recorded MDA coverages below the target treatment threshold of ≥65%. In 2015 and 2016, Kaloleni sub-county achieved coverage of 61% and 58% respectively, and in 2016 and 2017, Mvita sub-county achieved a coverage of 51% and 59% respectively.

Sample size

The prevalence of the main outcome (satisfactory performance) and risk factor (burnout) were assumed to be between 40% and 60%, and the true odds ratio between them to be at least two. Based on this, we determined that a sample size of 300 CDDs across the two sites would provide at least 80% power for detecting a statistically significant association between the risk factor and outcome at the level of p=5%. Based on Camic et al.,[138] we also conducted in-depth interviews with 48 CDDs.

Data collection

The interview guide and survey questionnaire were translated from English to KiSwahili and back-translated from KiSwahili to English in order to identify and reconcile discrepancies. The sub-county NTD focal points worked with community health extension workers to purposively select CDDs for interviews. CDDs were aged 18 years and older, had participated in the most recent MDA campaign and were considered active volunteers by the NTD program. The first 300 CDDs to answer the program's calls, and agree to participate in the study, were included. They were then informed about the location, day, and time of the interviews. Six trained public health interns from nearby sub-county hospitals conducted the interviews in KiSwahili. The interviews took place in a private room at the closest health center, and lasted for approximately 60 minutes. In-depth interviews were recorded using a voice recorder. Responses to the questionnaire were captured on tablets using Secure Data Kit. All data collectors were supervised to ensure that interviewing and standard data capture techniques were adhered to. In addition, transcripts and recordings were

reviewed by the lead author to ensure consistency between recording and transcription.

Data management and analysis

Survey

The data were exported from Secure Data Kit into Microsoft Excel, and, with the aid of StatTransfer version 13.0 exported to Stata 14.0 for cleaning, coding and analysis. We checked for duplicate records and made corrections for any inconsistent records. Five percent of all entered records were cross-checked with the electronic forms (or questionnaires). Based on Stamm, 2010, coding of burnout, secondary traumatic stress, and job satisfaction items was done to obtain the sum for the items. Z-scores were converted to t-scores with a mean of 50 and a standard deviation of 10. These variables were treated as both independent and dependent variables in the study.

The total hours spent on each NTD control activity by each CDD was calculated by multiplying the number of hours spent by each CDD per day and the total number of days the CDD invested in the MDA campaign. CDD performance scores were calculated using three questions, and treated as the main outcome variable. The questions were i) "How often do people swallow the medicine in front of you?", ii) "How often do you sensitize the community before MDA starts?", and iii) "Are you able to reach all the households you are assigned to by the end of MDA?". Each question had three possible choices, namely never, sometimes and always. Each question received a score of zero for choosing never, one for sometimes and two for always. The total score for each CDD was calculated. The distributions of the total scores was skewed and therefore, all CDDs with total scores below the median score of five were categorized as having insufficient performance, whereas those with a total score greater than or equal to five were classified as having good performance.

We used random effects logistic regressions to assess the associations of socio-demographic factors, job-related factors, total hours spent on CDD activities, and PQoL factors with the outcome, namely CDD performance. Sub-counties were considered as clusters in both the univariate and the multivariate models, and all independent variables with p≤0.2 in univariate models were used to construct a multivariable logistic regression model. The corresponding p-values for both univariate and multivariate models were also reported. We conducted mediation and

moderation analyses to examine potential mediation and/or moderation effects of PQoL sub-scales that were statistically significant in the models. These effects were examined in the context of statistically significant relationships between socio-demographic, burnout, job satisfaction, and secondary traumatic stress, and job-related variables and CDD performance. Socio-demographic variables include sex, educational level, marital status, household income per month, and age. Job-related variables included duration of serving for the LF program, serving as a volunteer or worker for other health programs, amount of own money spent during the last MDA, and the amount of time spent for training, social mobilization and sensitization, updating registers, collecting drugs from the health facility, distributing drugs to communities, and preparing reports during and immediately after the most recent MDA. We conducted the moderation analysis using random effects logistic regression models to determine the significance of interaction terms. The total effect of socio-demographic variables, job-related factors, and total hours spent on CDD activities on CDD performance was partitioned into direct and indirect effects using the binary_mediation command in Stata based on MacKinnon[139] and Kenny.[140] Bootstrap with 500 replications was employed to calculate bias-corrected 95% confidence intervals for the total, direct and indirect (i.e., mediated) effects. Based on the confidence intervals, statistical significance of the mediation effect was determined. We standardized all coefficients of regressions in the mediation analysis. Similarly, random effects univariate and multivariate models were constructed for the secondary outcome, retention status (i.e. whether or not a CDD would participate in the next MDA) using the afore-mentioned procedure for the performance models. Moderation and mediation analyses were also conducted for the retention outcome. Univariate and multivariate random effects linear regression models were employed to assess the effects of independent factors on PQoL sub-scales as outcomes. Before linear regression analyses were performed, continuous dependent variables were transformed onto a logit-scale using the function $t(x) = \log((x+1)/(max(x)+1-x))$ if they had a left-skewed distribution and were logarithmically transformed if they had a right-skewed distribution. All statistical tests were two-tailed and $p<0.05$ was considered to be statistically significant.

In-depth interviews

Interviews were digitally recorded and transcribed verbatim, translated into English, and reviewed before manual coding. Content analysis of the data in English was

conducted by the lead author, which involved a process of reading, coding, and displaying the data in order to develop a codebook. We limited the qualitative data analysis to further explore statistically significant associations found in the quantitative study.

Ethical considerations

Informed consent was obtained from all study participants, including consent for in-depth interviews to be digitally recorded. This study was reviewed and approved by the Kenya Medical Research Institute Scientific and Ethics Review Unit, and a waiver was obtained from the Ethics Committee of Northwest and Central Switzerland, approval number 2018-00694.

Results

Survey interviews

Table 1 depicts the distribution of socio-demographic characteristics of CDDs enrolled in the study. A higher proportion of CDDs were from Mvita sub-county (57.2%) as compared to Kaloleni sub-county (42.8%). Most CDDs were females (72.5%), had little to no primary education (81%) and were married (77.3%). Their median age in years was 39 (interquartile range: 32.0 - 46.0 years). There were more CDDs with primary education in Kaloleni sub-county (n=106) than in Mvita sub-county (n=24). There were more CDDs with secondary, vocational, and above in Mvita sub-county (n=124) than in Kaloleni sub-county (n=19). CDDs with a household income per month between 1000 and 4,000 KES (Kenyan Shillings; ~10-40 USD (United States Dollars)) formed the highest proportion, followed by income levels in the range of 4,000-10,000 KES (23.0%) and <1,000 KES (16.0%) respectively.

Table 1: Socio-demographic characteristics of CDDs involved in LF control in Kenya

Variable	Kaloleni (N=134) n (%)	Mvita (N=179) n (%)	Total (%)
Sex			
Female	82 (61.2)	145 (81.0)	227 (72.5)

Male	52 (38.8)	34 (19.0)	86 (27.5)
Total	134 (100.0)	179 (100.0)	313 (100.0)
Educational level			
Primary/No Education	106 (80.9)	24 (14.4)	130 (43.6)
Junior High School	6 (4.6)	19 (11.4)	25 (8.4)
Secondary/Vocational/Above	19 (14.5)	124 (74.2)	143 (48.0)
Total	131 (100.0)	167 (100.0)	298 (100.0)
Marital status			
Not Married	8 (6.0)	63 (35.2)	71 (22.7)
Married	126 (94.0)	116 (64.8)	242 (77.3)
Total	134 (100,0)	179 (100.0)	313 (100.0)
Household level income per month			
<1000 KES	34 (25.4)	16 (8.9)	50 (16.0)
1,000 - <4,000 KES	72 (53.7)	58 (32.4)	130 (41.5)
4,000-10,000 KES	15 (11.2)	57 (31.9)	72 (23.0)
>10,000 KES	2 (1.5)	31 (17.3)	33 (10.5)
Don't know	11 (8.2)	17 (9.5)	28 (9.0)
Total	134 (100.0)	179 (100.0)	313 (100.0)
Age, Median (IQR)	45.0 (38.0 - 49.0)	34.0 (29.0 – 42.0)	39.0 (32.0 – 46.0)

IQR-Interquartile Range

Table 2 presents the univariate and multivariate random effects logistic regression models, and the unadjusted odds ratio (OR) and adjusted odds ratios (aOR) of factors associated with CDD performance. CDDs with a household income per month between 1,000 and 4,000 KES (aOR=2.95, 95% CI: 1.45-6.02, p=0.003) and 4,000-10,000 KES (aOR=3.47, 95% CI: 1.51-7.96, p=0.003) were significantly more likely to have good performance compared to CDDs with a household income of less than 1,000 KES.

Table 2: Factors associated with performance of CDDs involved in LF control in Kenya

	Univariate Model		Multivariate Model	
Variable	OR (95% CI)	p-value	aOR (95% CI)	p-value
Sex				
Female	1		-	-
Male	0.80 (0.46-1.38)	0.42 [α]	-	-
Age (years)	1.00 (0.98-1.03)	0.74 [α]	-	-
Marital status				
Unmarried	1		-	-
Married	0.89 (047-1.70)	0.73 [α]	-	-
Educational level				
Primary/No Education	1		-	-
Junior High School	0.94 (0.39-2.30)	0.89 [α]	-	-
Secondary/Vocational/Above	1.46 (0.87-2.46)	0.15 [α]	-	-
Household level income per month				
<1000 KES	1		1	
1,000 - <4,000 KES	2.64 (1.35-5.16)	0.004*, [α]	2.95 (1.45-6.02)	0.003*, [α]
4,000-10,000 KES	3.52 (1.62-7.61)	0.001*, [α]	3.47 (1.51-7.96)	0.003*, [α]
>10,000 KES	2.05 (0.83-5.06)	0.12*, [α]	1.81 (0.70-4.68)	0.22*, [α]
Don't know	15.26 (3.27-71.33)	0.001*, [α]	16.89 (3.47-82.20)	<0.001*, [α]
Higher level of job satisfaction (5-point Likert scale)	1.03 (1.00-1.05)	0.03 [α]	1.01 (0.98-1.04)	0.39 [β]
Positive attitude and motivation (5-point Likert scale)	1.01 (0.98-1.04)	0.65 [α]	-	

Burnout (5-point Likert scale)	0.95 (0.92-0.97)	<0.001 α	0.95 (0.92-0.98)	0.001 β
Secondary traumatic stress (5-point Likert scale)	0.97 (0.95-0.99)	0.030 α	0.99 (0.96-1.02)	0.56 β
Duration of serving for the LF program				
<1 year	1		-	-
1-3 years	1.70 (0.80-3.60)	0.166 α	-	-
>3 years	1.58 (0.73-3.42)	0.244 α	-	-
Serving as volunteer or worker for other health programs				
Yes	1		1	
No	1.65 (0.93-2.94)	0.090 α	1.72 (0.94-3.16)	0.078 β
Amount of own money in KES spent in the last MDA campaign	1.00 (0.99-1.00)	0.980 α	-	-
Amount of time in hours spent on MDA activities				
Training attendance	0.99 (0.99-1.00)	0.769 α	-	-
Mobilization and sensitization	0.99 (0.99-1.00)	0.394 α	-	-
Updating register	0.99 (0.99-1.00)	0.401 α	-	-
Collection of drugs	0.99 (0.99-1.00)	0.307 α	-	-
Distribution of drugs	0.99 (0.99-1.00)	0.528 α	1.00 (0.99-1.01)	0.517 β
Preparing report	0.99 (0.99-1.00)	0.726 α	-	-

*Wald-adjusted p<0.01; α Intra-cluster coefficient (p>0.05); β Intra-cluster coefficient (p>0.05) | OR-odds ratio; aOR-adjusted odds ratio

The analysis also revealed that the relationship between household income per month and CDD performance was moderated by secondary traumatic stress (interaction term OR=1.03, 95% CI: 1.001-1.060, p=0.04). Further moderation analysis within one standard deviation (SD) of secondary traumatic stress score indicated that the odds of good CDD performance declined as household income level and secondary traumatic stress increased (Table 3).

Table 3: Moderation effect of secondary traumatic stress (STS) on the relationship between household monthly income and CDD performance among CDD involved in LF control in Kenya

	STS – 1SD		STS + 1SD	
Variable	OR (95% CI)	p-value	OR (95% CI)	p-value
Household level income per month				
<1000 KES	1		1	
1,000 - <4,000 KES	0.83 (0.22-3.10)	0.779	0.46 (0.07-2.85)	0.402
4,000-10,000 KES	0.32 (0.36-3.66)	0.363	0.10 (0.00-3.34)	0.198
>10,000 KES	0.07 (0.83-5.06)	0.002	0.01 (0.00-1.59)	0.076
Don't know	0.15 (0.00-1.80)	0.107	0.01 (0.00-11.52)	0.214

SD-standard deviation

Table 4 presents the results of univariate and multivariate random effects logistic regression models with CDD retention as the outcome. For a unit increase in burnout, retention of CDDs was 10% less likely (aOR=0.90, 95% CI: 0.82-0.98, p=0.021). For a unit increase in total hours of drug distribution, the odds of CDD retention increased by 7% (aOR=1.07, 95% CI: 1.01-1.14, p=0.03). CDDs that were not volunteers for other health programs were 83% less likely to continue volunteering as compared to those who were volunteers for other health programs (aOR=0.17, 95% CI: 0.04-0.85, p=0.03).

Table 4: Factors associated with CDD retention among CDDs involved in LF control in Kenya

Variable	Univariate Model		Multivariate Model	
	OR (95% CI)	p-value	aOR (95% CI)	p-value
Sex				
Female	1		-	-
Male	2.70 (0.33-22.28)	0.36 [α]	-	-
Age	1.00 (0.93-1.07)	1.0 [α]		
Marital status				
Unmarried	1		-	-
Married	0.48 (0.06-3.96)	0.50 [α]	-	-
Educational level				
Primary/No Education	1		-	-
Junior High School	0.37 (0.06-2.11)	0.26 [α]	-	-
Secondary/Vocational/Above	2.24 (0.40-12.43)	0.36 [α]	-	-
Household level income per month				
<1000 KES	1		-	-
1,000 - <4,000 KES	0.64 (0.70-5.89)	0.70 [α]	-	-
4,000-10,000 KES	1.45 (0.88-23.73)	0.70 [α]	-	-
>10,000 KES	0.65 (0.04-10.82)	0.77 [α]	-	-
Don't know	0.55 (0.33-9.16)	0.68 [α]		
Job satisfaction (5-point Likert scale)	0.98 (0.90-1.07)	0.68 [α]	-	-
Attitude and motivation (5-point Likert scale)	0.95 (0.88-1.04)	0.29 [α]	-	-
Burnout (5-point Likert scale)	0.91 (0.85-0.98)	0.009 [α]	0.90 (0.82-0.98)	0.02 [β]
Secondary traumatic	0.92 (0.86-0.99)	0.03 [α]	0.98 (0.90-	0.58 [β]

stress (5-point Likert scale)			1.06)	
How long have you been a volunteer for the LF program				
<1 year	1		-	-
1-3 years	2.89 (0.47-17.98)	0.25 [α]	-	-
>3 years	2.25 (0.36-13.99)	0.39 [α]	-	-
Apart from the NTD program, are you a community health volunteer or worker for other health programs				
Yes	1		1	
No	0.25 (0.05-1.28)	0.10 [α]	0.17 (0.04-0.85)	0.03 [β]
How much of your money in KES did you spend in total in the last time you participated in MDA	1.00 (0.99-1.00)	0.75 [α]	-	-
How much time in hours do you spend on these MDA activities?				
Training attendance	1.00 (0.99-1.01)	0.88 [α]	-	-
Mobilization and sensitization	1.00 (0.99-1.01)	0.90 [α]	-	-
Updating register	1.02 (0.94-1.10)	0.66 [α]	-	-
Collection of drugs	1.00 (0.99-1.01)	0.92 [α]	-	-
Distribution of drugs	1.06 (0.99-1.13)	0.09 [α]	1.07 (1.01-1.14)	0.03 [β]
Preparing report	1.00 (0.99-1.02)	0.68 [α]	-	-

α Intra-cluster coefficient (p>0.05); β Intra-cluster coefficient (p>0.05)

Table 5 presents univariate and multivariate linear regressions with job satisfaction scores of CDDs as outcome. In the multivariate regression, a unit increase in attitude and motivation scores on the logit-scale increased job satisfaction scores on the logit-scale by 0.261 (95% CI: 0.030- 0.491, p=0.027). Also, a unit increase in burnout scores reduced the job satisfaction scores of CDDs on the logit-scale by 0.048 units on average (95% CI: -0.065- -0.031, p<0.001). An increase in CDDs' experience from less than a year to more than 3 years for being volunteers in the LF program was positively associated with job satisfaction (Coeff= 0.707, 95% CI: 0.124- 1.290, p=0.048).

Table 5: Factors associated with CDD job satisfaction among CDDs involved in LF control in Kenya. Linear regression models.

	Univariate Model		Multivariate Model	
Variable	Coeff (95% CI)	p-value	Coeff (95% CI)	p-value
Sex				
Female	1		-	-
Male	0.017 (-0.364- 0.399)	0.93 [α]	-	-
Age	0.017 (0.001- 0.034)	0.04 [*, α]	0.006 (-0.011- 0.025)	0.50 [β]
Marital status				
Unmarried	1		-	
Married	0.266 (-0.139- 0.671)	0.20 [α]	-	-
Educational level				
Primary/No Education	1		1	
Junior High School	-1.113 (-1.743- -0.483)	0.001 [*, α]	-0.719 (-1.357- 0.081)	0.03 [β]
Secondary/Vocational/Above	-0.482 (-0.832- -0.133)	0.007 [*, α]	-0.125 (-0.529- 0.280)	0.55 [β]

Household level income per month

<1000 KES	1		-	
1,000 - <4,000 KES	0.174 (-0.327-0.675)	0.50 α	-	-
4,000-10,000 KES	0.232 (-0.322-0.786)	0.41 α	-	-
>10,000 KES	0.496 (-0.179-1.172)	0.15 α	-	-
Don't know	-0.120 (-0.831-0.590)	0.74 α	-	-
Attitude and motivation (5-point Likert scale) φ	0.398 (0.180-0.615)	<0.001 α	0.261 (0.030-0.491)	0.03 β
Burnout (5-point Likert scale)	-0.042 (-0.059- -0.026)	<0.001 α	-0.048 (-0.065- -0.031)	<0.001 β
Secondary traumatic stress (5-point Likert scale)	-0.010 (-0.027-0.007)	0.26 α	-	-

How long have you been a volunteer for the LF program

<1 year	1		1	
1-3 years	0.359 (-0.189-0.908)	0.20 *, α	0.380 (-0.149-0.910)	0.16 *, β
>3 years	0.577 (-0.014-1.140)	<0.05 *, α	0.707 (0.124-1.290)	0.05 *, β

Apart from the NTD program, are you a community health volunteer or worker for other health programs				
Yes	1		-	
No	-0.127 (-0.486-0.233)	0.49 [α]	-	-
How much of your money in KES did you spend in total in the last time you participated in MDA [φ]	-0.207(-0.414-0.001)	0.05 [α]	-0.335 (-0.541- -0.129)	0.001 [β]
How much time in hours do you spend on these MDA activities				
Training attendance [φ]	-0.258 (-0.449- -0.066)	0.008 [α]	-0.037 (-0.265-0.191)	0.75 [β]
Mobilization and sensitization [φ]	0.077 (-0.172-0.326)	0.55 [α]	-	-
Updating register [φ]	-0.314 (-0.482- -0.147)	<0.001 [α]	-0.045 (-0.275-0.185)	0.70 [β]
Collection of drugs [φ]	0.082 (-0.049-0.214)	0.22 [α]	-	-
Distribution of drugs [φ]	-0.200 (-0.341-0.059)	0.005 [α]	-0.047 (-0.147-0.241)	0.64 [β]
Preparing report [φ]	0.031 (-0.072-0.135)	0.55 [α]	-	-

*Wald-adjusted $p<0.01$; α Intra-cluster coefficient ($p>0.05$); β Intra-cluster coefficient ($p>0.05$); φ=Transformed onto logit-scale [$\log(x)$]; ¥= Transformed onto logit-scale [$\log((x+1)/(\max(x)+1-x))$]

In-depth Interviews

The qualitative component of the study further explored CDD job satisfaction, burnout, traumatic stress, motivation, and performance experienced during MDA, with a focus on the nature of the financial, emotional and physical stressors.

1. Work demands and remuneration

Out of pocket expenses

CDDs regularly incurred expenses related to the drug distribution beyond logistics. Sometimes, out of compassion, CDDs purchase food and water for community members to ingest the drugs they distributed. If they did not, community members might have refused to participate in MDA.

You see we are volunteers but when we reach there we are the sponsors. Because some when you meet them you must give them something to eat. We use money from our own pockets. (CDD, woman, over 50 years old)

Work demands

CDDs emphasized that they found it challenging to achieve household targets given the physical demands of distributing medicines, particularly in areas with apartment buildings.

I'm given a period of 5 days to work so as to reach my target. This is usually a big challenge: imagine on my side I have 10 apartment blocks each with 20 households, that's only one row mind you. Will I really manage to finish? (CDD, man, 50 years old)

Remuneration

Dissatisfaction with compensation was the most consistently reported factor that affected CDDs' job performance. CDDs often felt demoralized after receiving their small stipend or payment relative to their workload, which is given after MDA for distributing medicines over the course three to five days. After paying for food, water, transport, and airtime during MDA, they were left with very little money.

They give us payment to motivate us, because imagine 500 KES (~5 USD) a day that's your fare and everything you do during the day. At the end of the day, we have nothing. (CDD, woman, 34 years old)

It was mentioned that the payment CDDs expected was often not what they received after working hard.

I can say about the payment we were promised and what we were given really broke my heart. We worked so hard expecting we will receive 5000 KES (~50 USD) but then we received 2500 KES (~25 USD). (CDD, woman, 43 years old)

2. Job satisfaction

CDDs expressed that they find pleasure in serving their community to prevent diseases and witnessing change in the community, and feel satisfied when community members show appreciation and support.

I met this family who was ready to provide me with tea because the work we were doing to the community at large. As we were taking this tea, they even mobilized their neighbors to come and get the drugs in their house. So I felt so much encouraged with this act they did. (CDD, man, 29 years old)

Data revealed that the major source of dissatisfaction among CDDs was the inadequate incentives they received for volunteering.

We were not provided with water, lunch, airtime transport, there were not enough T-shirts, bags, and umbrellas so we had to walk in scorching sun. We were not given a sufficient amount. (CDD, woman, 36)

3. Work-related stress

Burnout
The interviews revealed signs of burnout, which included feelings of frustration and exhaustion. CDDs became frustrated and exhausted from the physical and mental

demands of the job, lack of resources, and resistance from the community; all of which were compounded by dissatisfaction with compensation.

Yeah exhaustion, sometimes you get tired because giving medicines involves movement from one multi-story building to the next. Remember you use your own transport, food, you see sometimes you get tired. You must give drugs whether it is rainy or at times when it is too hot. Again, sometime when you give somebody drug some vomit intentionally or they don't want to accept it. (CDD, woman, over 50 years old)

Secondary traumatic stress
A few CDDs described experiencing traumatic stress as they encountered hostile community members that refused the drugs.

Yes, we met this person who demanded to know what we are distributing by force and even wanted to fight us because according to him we are poisoning the community. (CDD, man, 29 years old)

There was a woman whom I met so we talked and I wrote her name and before taking the drug she called her husband then after talking to him she jumped to me, took the tally form by force and rubbed her name and chased us away. I felt that earth should swallow me it was so traumatizing. (CDD, woman, 52 years old)

One CDD reported feeling disturbed after encountering a dog that chased her away.

There was a time I got to a household, when I tried knocking at the gate, a dog came running towards me so I quickly closed the door until the owner of the house came. Imagine if I hadn't quickly closed the door, I would have been bitten and I remember that dog was big. (CDD, female, 47 years old)

CDDs reported coping with traumatic situations by walking away to avoid more trouble and following up the next day. One participant reported discussing the issue with fellow CDDs and obtaining support from his supervisor. Supervisors are healthcare workers based in health facilities across various catchment areas. They are responsible for ensuring that CDDs are trained, have medicines, and submit daily

reports on number of people treated. Supervisors also advise CDDs on ways to handle challenging situations they may encounter during MDA, as well as provide feedback on performance.

I talked to those CDDs who are experienced, and I got to interact with the lady more often, so I got to understand where she's coming from, that helped me through. I also talked to the supervisor who gave more information and courage to go on. (CDD, man, 24 years old)

4. Attitude and coping strategies

Attitude and motivation

Despite dissatisfaction with some aspects of volunteering, all CDDs participating in the in-depth interviews indicated they would volunteer in future MDAs. Data revealed that, for the majority of CDDs, the primary motivator for volunteering was their commitment to serve the community, not the monetary incentive. CDDs believed their work brought change to the community by helping to prevent diseases.

I was just feeling for the people who are suffering from different diseases. I was seeing that they are not being reached so I felt I should reach them. (CDD, woman, 36 years old)

I like doing humanitarian work and helping people in the society. Since LF is out there, I decided to volunteer so as to make people know about it. (CDD, man, 29 years old)

Discussion and Conclusions

This is the first study to use the PQoL framework to explore and describe the on-the-job experiences of CDDs in sub-Sahara Africa. Previous studies conducted in Ethiopia, South Africa, and Nigeria had revealed a negative association between burnout and job satisfaction and performance among primary health providers, including community health workers. CDDs with higher monthly household income were more likely to have good performance. This finding may suggest that CDDs with higher income are better able to afford out of pocket expenses like transport, water, food and airtime, allowing them to effectively and efficiently achieve MDA targets.

Alternatively, they may be more intrinsically motivated to serve as volunteers, valuing the importance on helping their communities and maintaining a positive social status more than external rewards from the NTD program. Indeed, during interviews the CDD explained that they purchased food and water for community members to ingest medicines in an attempt to overcome low coverage and compliance. This may be combined with meeting the demands of their families and socio-economic constraints.[17] CDDs with higher burnout scores were less likely to have good performance and continue to volunteer. Interviews showed that CDDs found it challenging to achieve their targets given the physical exhaustion that comes as a result of distributing medicines in areas with apartment buildings in a short amount of time, and in rain and the hot sun. In Tanzania, Kisoka and colleagues found that CDDs were not able to reach all households in the planned distribution period.[23] Another study in Mali on schistosomiasis control found that the allocation of too many households caused CDDs to be overburdened, impacting their motivation and performance.[141] Furthermore, higher monthly income results in better performance when secondary traumatic stress is low. This finding is supported by qualitative interview statements where CDDs shared that they experience hostility and verbal abuse from some community members. In a previous publication we also reported that community members' distrust of CDDs often led to sharp resistance and negative treatment of CDDs in Kenya.[44] Although some CDDs may be able to afford out of pocket expenses to achieve their targets, experiences of stress may adversely impact their performance.

CDDs who were not volunteers for other health programs, had higher secondary traumatic stress scores, and spent more hours distributing medicines were less likely to continue to volunteer than their peers not sharing these characteristics. A possible explanation for this is that CDDs who volunteer for other programs are familiar with the demands, have developed resilience and an ability to cope with it. On the other hand, CDDs who do not volunteer for other health programs may think that working longer hours and continuing to volunteer will result in more monetary and material incentives. In Uganda, recognition from the community and improvement in social status motivated CDDs to continue to volunteer.[26] In Kenya, CDDs who felt appreciated by communities were motivated to continue working for the NTD program.[44] In our analysis we confirmed that higher attitude and motivation scores and more years of experience as a CDD were associated with higher job satisfaction

while an increase in burnout scores reduced job satisfaction. Despite mentioning that they are not satisfied with the monetary incentives they received, and experience of emotional and physical exhaustion during MDA, CDDs revealed that they are primarily motivated to serve the community because their work prevented diseases, which gave them job satisfaction. We did not find a statistically significant relationship between household monthly income and gender.

At the national level, MDA planning and implementation should include trainings for CDDs that not only emphasize dosage and disease information, but also ways in which they can cope during stressful situations, and an emphasis on factors that are known to increase motivation and satisfaction. Furthermore, multi-level supervision of CDDs by direct supervisors and the sub-county NTD program staff can help to ensure that CDDs have the resources and support they need to be effective.

The current study highlights the need for additional research on CDD performance. Future studies should examine ways in which CDDs cope with negative experiences during MDA, as well as the impact of PQoL and job-related factors on the different dimensions of effective coverage. One of the main limitations of the current study is the relatively limited sample size, precluding more accurate or geographically diverse conclusions. In addition, we were unable to draw a causal relationship between PQoL measures and retention and performance. Also, CDDs may have provided socially desirable responses for various questions. Furthermore, CDDs were selected by the sub-county NTD program, which may have resulted in a biased sample. Conducting a longitudinal study would allow future studies to understand CDD experiences over time, and its impact on coverage. Similarly, the in-depth exploration of how CDDs cope in stressful situations during MDA could further increase our understanding of confounding factors.

The effective engagement of CDDs in the fight against LF is critical to the achievement of national and international elimination goals. Given the prevailing socio-cultural landscape in many resource-limited settings, there are added pressures on CDDs to not only meet the demands of the NTD program, but also those of their families and communities, coupled with significant socio-economic constraints. Within this larger context, CDDs are extrinsically motivated to volunteer, but also have to perform well in unfavorable work conditions, including out of pocket

expenditures during MDA to achieve their targets, negative and hostile interactions with communities leading to stress, inadequate remuneration, and burnout from workload and physical exertion. Irrespective of their poverty level and exclusion from the formal economy, poor CDDs are expected to volunteer their time, accept the incentives they are given, and optimize the health of poor communities. Global policy around the expectations and remuneration of CDDs should be reviewed in partnership with country programs. In doing so, we must also determine whether and how we are widening the gap between the NTD program, which exists to help the poor, and the poor, and failing to protect the rights of CDDs. These gaps can be closed with effective national and international advocacy and partnerships with donors, new policies, country ownership of the elimination of LF, and adequate incentives and training, supportive supervision, and manageable workload for CDDs, and community acceptance of all CDDs. Furthermore, an examination of the sustainability of the use of CDDs to deliver preventive chemotherapy is needed.

Declarations

Consent for publication

All authors have provided consent to publish this material.

Availability of data and materials

The dataset supporting the conclusions of this article is available on request from the lead author.

Authors' contributions

CK: conceived and designed the study. CK: collected data. CK: analyzed data and drafted the manuscript. PS and SM: contributed to interpretation of findings and revised the draft manuscript.

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Competing interests

The authors declare that they have no competing interests.

Ethics approval and consent to participate

Informed consent was obtained from all study participants, including consent for in-depth interviews to be digitally recorded. This study was reviewed and approved by the Kenya Medical Research Institute Scientific and Ethics Review Unit, and a waiver was obtained from the Ethics Committee of Northwest and Central Switzerland, approval number 2018-00694.

Chapter 13: Discussion

The development and implementation of the community-directed treatment approach came at a critical time when LF was determined to be eradicable and the discovery of preventive chemotherapy to fight LF and donation of medicines by three pharmaceutical companies led to the operational question of: How do countries deliver mass treatment to at-risk groups [107]? The approach also came at a time where economies like Kenya were fragile and progressing slowly and marginally even with the help of the World Bank's Structural Adjustment Program [142]. Although the adoption of the community-directed treatment approach by WHO was informed by evidence from a multi-country study [100], it was not implemented, evaluated, and sustained as intended in Kenya due to resource constraints, which led to low epidemiological and geographical coverage. In this dissertation project, we assessed the role of CDDs and identified various barriers and facilitators of their optimal performance during MDA. CDDs face resistance from communities and are inadequately compensated, trained, and supported by the NTD program. The resistance from community members is because they lack knowledge of LF, do not trust the federal government and CDDs, or do not perceive to be at-risk for LF. In addition, CDDs often experience burnout and stress due to high workload and limited time, which negatively affect their performance and retention. Lastly, financial and human resource constraints at all levels of the health system lead to sub-optimal planning and implementation of MDA.

The findings of this thesis were in-line with findings from other studies conducted in similar settings in Africa [23, 27, 28, 45, 84], and filled a gap in knowledge around the emotional, physical, and professional experiences of CDDs' on-the-job-experiences and how that may decelerate the elimination of LF. The study generated additional knowledge about the socio-eco system that CDDs work in, as well as the multi-level factors that affect the performance and retention of CDDs in the fight against LF. Findings from this project show that the CDD strategy that was developed and implemented in 2000 does not currently meet the emerging needs of communities and the NTD program. In addition, CDDs experience high levels of stress, burnout, de-motivation, and dissatisfaction on-the-job with limited support and resources from the NTD program. These challenges affect CDD performance and retention. The challenges and advantages of delivering medicines to vulnerable groups using

community volunteers reveal larger questions around the extent to which the community-directed treatment approach was delivered as intended. In order to understand fidelity to the approach, it is important to understand the two distinct approaches tested in the multi-country feasibility study conducted by the WHO and its partners in 2000 in Kenya and Ghana on the best treatment approach for delivering preventive chemotherapy to communities [100]. The feasibility study compared two methods, namely mass treatment through the health system like other mass treatment programs and community-directed treatment introduced by the health system, but the community would design and implement their own method for drug delivery [100]. The activities related to the implementation of both drug delivery methods fall into five broad categories:

- Sensitization of the health service and the community
- Development and utilization of health education messages and information, education, and communication materials
- Selection of distributors as well as timing and mode of drug distribution
- Training of key stakeholders at all levels of the health system
- Procedures for drug distribution, monitoring, and record keeping

In community-directed treatment, community members select drug distributors, the drug delivery method, and timing for drug delivery; CDDs obtain medicines from an agreed upon place, distribute medicines, monitor drug delivery and maintain records [100]. The report also noted the specific reasons for the success of the community-directed treatment approach compared to the health system approach. They included:

- Health workers could only distribute medicines after starting their shift, which meant missing some target groups; however, CDDs could distribute medicines before people went to their farms in the morning and when they arrived home in the evening. Living in the community made it easy for them.
- Health staff distributed medicines in communities, and left medicines for community members to continue with the distribution. However, with community-directed treatment, there were multiple distributors in each community, as well as other community members that supported drug distributors with the registration of community members. This reduced the workload of CDDs.

- Health staff saw distribution as an additional demanding responsibility; however, CDDs were motivated to work because they were committed to serving their communities.
- Systems were put in place in communities to ensure that MDA achieved its goals. High knowledge about the benefits of the medicines caused community members to actively approach CDDs when they had not received the medicine. These were internal checks and balances that ensured that the distribution was done properly.
- Health workers and communities were satisfied with the community-directed treatment approach.

The challenges around the distribution of medicines by CDDs identified in this dissertation suggest that the community-directed treatment approach may not have been implemented in the right conditions. Community complaints about CDDs distributing drugs hurriedly, timing of distribution, and distrust of CDDs because they may not reside in their community is not consistent with the principle underpinning the multi-country study. The study was based on the premise that community members should know and select distributors, and plan distribution around the availability of community members. Furthermore, CDDs' complaints about high workload and limited time, physical and emotional exhaustion, and trauma as a result of heat, rain, climbing stairs, and verbal abuse from community members, further demonstrates the gap between intention and reality. Per the feasibility study, CDDs are to receive support and even resources from community members, comfortably achieve their targets, and have a positive relationship with those they serve [100]. These gaps can be attributed to the changing socio-cultural landscape, the evolving definition and physical demarcation of a community, and the transformation of many Kenyan areas from rural to peri-urban and urban settings. Members of communities may not always know CDDs serving them. Also, CDDs are more likely to have high workload and very little support from community leaders and members. This may be the reason for CDD bias towards community members they know during MDA as shown by Chami and colleagues in Uganda [130]. Additionally, wealthy individuals that live in apartment buildings and gated communities may not identify with the larger community that they live in, leading to distrust of CDDs. Furthermore, present day community members may be engaged in work other than farming, which has implications for how and when CDDs most efficiently and effectively distribute

medicines. In addition, high workload and limited time and compensation prevent CDDs from conducting directly observed treatment and mop up. Another gap in the implementation of MDA in Kenya and other similar settings is that CDDs are expected to conduct social mobilization several days before MDA while during the feasibility study, community leaders and health workers jointly engaged in social mobilization [100]. However, currently, due to high workload and low motivation, some CDDs do not offer health education to community members, which result in distrust of CDDs. Interestingly, communities assumed the cost associated with training CDDs, including transportation and food during the feasibility study [100]. This is because every community had a fund for supporting community programs [100]. It was also noted in the feasibility study that many CDDs dropped out and expressed frustration because they perceived the workload to be too high for the compensation they were given [100]. Communities were asked to decide on and implement their own strategy for remunerating CDDs to easily move throughout communities during MDA [100]. However, currently, CDDs in Kenya are paid a small amount of money to attend training and distribute medicines over a four to five day period, which includes social mobilization and registration. They are not paid extra money for mop-up and any additional time they use to achieve their targets, obtain medications, and submit reports. CDDs also assume all cost for food, water, transportation, airtime, and other job materials. Findings from this thesis show that sometimes CDDs are not paid on time or at all, affecting their job satisfaction, motivation, and effective coverage. Currently, CDDs that do not have high income are not likely to perform well because they can't afford transportation and airtime. This suggests that the compensation they receive from the NTD program does not cover their expenses. Also, the greater the stress, the less likely it is that CDDs with higher income are able to perform well. If CDDs do not have positive relationships with or are not selected by communities, medicines will not be accepted. If heat, rain, geographic barriers, verbal abuse, burnout, and poor timing affect CDDs, coverage will be low.

Are we setting CDDs up for failure? Based on the study's findings, it is clear that additional feasibility studies could have improved or strengthened various components of the community-directed treatment approach. For example, in urban and peri-urban areas, the NTD program can have fixed posts in popular areas in order to reach workers and market women. Also, social mobilization, community

sensitization, and community leaders' engagement strategies can be developed and tailored in partnership with communities in order to meet their needs. Communities should be able to re-design and implement their own method for drug delivery. With the emergence of globalization coupled with stalled economic growth the late 90s and early 2000s, Kenya not only had to grapple with finding funds for health services delivery, but also applying neoliberal policies that help the poor rise out of poverty [142]. This may have meant that the government was forced to overlook labor rights violations and unethical and impractical foreign investments and trade deals, doing more harm than good. Ezeonu (2008) and Engberg-Pederson (1996) would argue that the neoliberal agenda and ideology of free markets and equal playing field caused more harm than good; however, the result had devastating effects on vulnerable populations, especially the poor, women and children [142]. For example, trade agreements limited the effective management of the HIV/AIDS epidemic because trade deals meant that medicines would be too expensive for those that needed them the most [142]. Engberg-Pederson (1996) criticized that structural adjustment programs did not take local circumstances into consideration, resulting in low funding for the health care system [143]. Likewise, the data from this dissertation study show that the WHO did not take Kenya's economic downturn and lack of budget allocation for health care into consideration when the community-directed treatment strategy was developed, tested, and launched. As a result, Kenya was asked to independently implement a strategy that could not be domestically funded and sustained, which would set the stage for setting CDDs up for failure and at a disadvantage. In this context, the responsibility of delivering preventive chemotherapy to the poor was transferred from the government onto vulnerable individuals that had limited opportunities for education, employment, and good health. This responsibility may have been sustained by Kenya's ethnicized, elitist, and violent politics, which resulted in the politicization of health policies, healthcare, and health service delivery through the devolution [142, 143]. Furthermore, although the devolution was meant to give the counties in Kenya more autonomy in health service planning and delivery, the reality was that all decisions about health care came from politicians [74]. This meant that there would be limited human and financial resources to build a resilient workforce for the elimination of LF.

It is very clear from the study's findings that CDDs' intrinsic motivation to support the NTD program and help their communities makes them easy to exploit by the national

NTD program, implementing partners (NGOs), donors, and the WHO while impeding progress on the elimination of LF. At the global level, the WHO has not used findings from recent studies on the motivation and performance of CDDs to revise existing community-directed treatment strategies since the year 2000. In addition, donors place a cap on funding for MDA for their grantees (implementing partners/NGOs), which often reflect the allocation of limited funds for the engagement of CDDs before, during, and after MDA. At the country level, challenges with the devolution mean that as domestic and international funds move from the global level to the national level and to the sub-national level for MDA, they are delayed, unavailable, mis-used, or mis-appropriated [69, 74]. This also means that the sub-national NTD program will have very limited funds to fully support CDDs during MDA. Also, work plans and funding objectives for MDA and LF elimination are not always developed with country input, which may result in unmet needs of CDDs.

This dissertation shows that CDDs are vulnerable and susceptible to exploitation because they themselves are poor and appreciative of any amount of money they can obtain (which they often use to help the program achieve its targets) regardless of working conditions during MDA. Community Drug Distributors may be appreciative of the limited amount of money because MDA may be one of the very few opportunities they obtain to earn minimal amounts of cash. Also, CDDs may believe that doing volunteer work for the NTD program can increase their chances of getting a paid job in another campaign. Furthermore, CDDs deliver interventions to poor people, which may be associated with high out of pocket expenditure on food and water for households that require treatment during campaigns [44]. Supervisors for CDDs repeatedly ask them to cope with and accept negative work experiences in order to achieve targets [44, 45]. They also ask CDDs to remember their intrinsic motivation for joining the NTD program [17, 44, 45]. The NTD program may call this encouragement, supportive supervision, or motivation, but it could also be manipulation when nothing is done to increase their effectiveness and job satisfaction. In 2016, McCollum and colleagues showed that, although CDDs, mostly women, do their work out of intrinsic motivation, they and their families might be poor (due to low, no compensation, out of pocket and opportunity costs during MDA), which places volunteers at a disadvantage and perpetuates the cycle of poverty in communities that are impacted by NTDs [144]. In 2018, the WHO's gender equity hub and other stakeholders conducted a literature review of gender and equity in the global health

workforce with a focus on occupational segregation; decent work free from bias, discrimination and harassment, including sexual harassment; gender pay gap; and gender parity in leadership. The key findings in the report were that the critical role of women in health (70% health workforce) is often overlooked, so priority not given to addressing gender/equity in workforce; gender inequality in health and social care workforce will limit delivery of universal health coverage and health for all; female majority professions are given lower social value, status, and pay; occupations are driven by gender norms and stereotypes of jobs culturally labeled 'men's' or 'women's' work; women in health workforce face bias and discrimination; female health workers face burden sexual harassment causing harm, ill health, attrition, loss morale, stress; a lack laws and social protection that are the foundation for gender equality at work [33]. Finally, the findings of this study also support that monitoring and evaluation studies within two years of the rollout of the community-directed treatment approach could have resulted in better results.

Chapter 14: Recommendations

Several strategies can improve the equitable, efficient, and effective delivery of medicines to at-risk groups. CDDs require additional support in order to feel motivated to do their jobs well, and they can be positively engaged in the following ways.

Chapter 14.1: Policy and NTD program recommendations

The NTD program in Kenya would benefit from impact evaluations of the community-directed treatment approach to make programmatic improvements. This will require policy dialogue, advocacy, and quality data and tools to mobilize support at the global and national levels for the adaptation of the community-directed treatment approach. In addition, a critical examination of partners, and their operation models, roles, responsibilities, and resources can facilitate country ownership of the policy direction and development dialogue. A revised community-directed treatment approach should reflect integration and mainstreaming of NTDs, informal community structures, digital data and analytic strategies, plan for country mobilization of resources, implementation research, and effective coordination across country and international stakeholders. Finally, greater transparency from the Kenyan government about the need for MDA and the public involvement of officials in MDA can increase community

trust in the NTD program. Transparency from county and sub-county governments during MDA campaigns about the supply-chain of medicines, funds disbursement for MDA activities, and the use of funds can help ensure that there are no funding and treatment gaps.

Chapter 14.2: Funding

Given that funding constraints are often cited as reasons for the inadequate and untimely training, support, and compensation of CDDs, Kenya must create and implement a long-term funding plan that meets the needs of the NTD program. This can be done by first understanding the funding gaps and implications, and ensuring that there is political will to create an NTD line item in the health budget of the government. Also, leveraging resources from other disease programs can help reduce funding gaps, maximize impact, and sustain progress. At the international level, partner coordination will be critical, and require a review and synergy of activities. A well-coordinated stakeholder network to effectively advocate for resources to improve MDA planning and implementation is extremely important in the fight against LF.

Chapter 14.3: CDD and frontline health worker engagement

Trainings for CDDs should be evaluated and revised to increase their knowledge of LF and medicines, effectively engage communities, cope with stress and burnout, and respond to emerging needs during MDA. Social mobilization strategies should also be evaluated and revised in partnership with communities, frontline health workers, and the sub-county and county NTD programs. Also, supportive supervision by frontline health workers and additional resources are needed to help CDDs stay motivated and comfortably meet their targets. Frontline health workers and CDDs might benefit from digital tools that allow for real time assessment of challenges and targets, positive reinforcement of CDDs, and the rapid dissemination of solutions to improve targets and MDA experiences. Furthermore, additional job resources such as talk time credit, access to transport to reach distant communities, the ratio of CDDs to community members can decrease by recruiting additional CDDs. Finally, an increase in compensation can improve job satisfaction among CDDs, resulting in high coverage.

Chapter 14.4: Communities

If communities select their own CDDs, they may be willing to pool their resources to provide food, water, and community accountability during MDA. Also, community leaders can be better equipped to serve as liaisons between community members and CDDs, ensuring that they accept medicines and have positive interactions with CDDs. In communities with informal structures and affluence, other delivery platforms can be utilized. The findings of this dissertation reveal the importance of integrating MDA into the health system and informal community structures.

Chapter 14.5: Implications for research

This dissertation project revealed the need for additional research on the contribution of CDDs, the opportunity costs they incur during MDA, and the sustainability of the community-directed treatment approach. Using evidence from this project, it is critical to identify and test specific indicators that are needed to support and sustain the gains of CDDs as they deliver medicines to at-risk groups. In addition, new and innovative approaches must be developed and rigorously tested in efforts to to integrate MDA and the work that CDDs do into the health system and across disease programs, and motivate CDDs. In order to achieve their elimination targets, the NTD program in Kenya will require resources and scientific evidence to implement changes at all levels of the health system.

Chapter 15: Limitations

The methods used in this dissertation allowed for more in-depth, rigorous and multi-faceted investigation of the role of CDDs in the fight against LF. Although various research methods were used to triangulate and support the findings of this thesis, we cannot determine causality between programmatic and socio-cultural factors and CDD performance and retention. First, the study design did not allow for the randomization of study participants for interviews and surveys, thereby potentially biasing responses towards the negative aspects of the work of CDDs. In addition, recall bias may have been present given that MDA were conducted almost a year earlier. Second, given that the planning and implementation of MDA is typically paid for by donors and executed by other key program support persons on the ground, the study would have benefited from interviews with them. Third, the development, testing and evaluation of an intervention that addresses the challenges identified in

this thesis would have not only filled a knowledge gap, but also result in the identification of indicators that can be used to motivate and support CDDs. Finally, the findings may only be applicable to settings with similar socio-cultural and economic constructs, infrastructure, MDA processes, and political climate; however, the methods and measures used may be useful to investigate effective coverage in other contexts.

Chapter 16: Conclusions

Over the last two decades, CDDs have played a critical role in delivering mass treatment to millions of people at risk for LF. Despite these gains, countries like Kenya, in the last mile, experience challenges around the planning and implementation of MDA, which jeopardize the goal of eliminating LF as a public health problem. This dissertation shows the factors that jeopardize the contribution of CDDs, as well as opportunities to improve the motivation, retention, and performance of CDDs. Acceptability, accessibility, and availability coverage during MDA will increase with innovations in the areas of training; adequate incentives; broad acceptance of CDDs by communities using their own criteria; supportive supervision by communities and CHEWs; provision of essential job resources; reduction of workload or timely and adequate payment for pre-MDA, MDA and post-MDA activities; involvement of officials at all levels of the government in social mobilization to build citizens' trust; robust and easy ways for CDDs to obtain additional; provision of medicines using other delivery platforms that appeal to urban areas, social classes and occupations; and community appreciation of CDDs. It is recognized that Kenya relies almost exclusively on the support of NGOs to implement MDA, which has its challenges; however, the support of NGOs, donors, and country governments should reflect the real needs of CDDs and communities, efficiency, cost-effectiveness, non-discrimination, accountability, and equality. Gaps in epidemiological coverage mean that there are limited opportunities for communities to participate in MDA and that a holistic approach to health and development is needed. In other words, a right to health, human rights, and universal health coverage lens are needed to facilitate changes in the engagement of CDDs for the elimination of LF. We have the moral obligation to protect the rights and on-the-job experiences of CDDs. Without this, we are jeopardizing attempts to build a resilient workforce and health system to deliver primary health care to at-risk groups, sabotaging the achievement of global and

national targets. Funding and policy bodies and NTD programs should prioritize the ongoing monitoring and evaluation of the community-directed treatment approach and commit to making adaptations for long-term gains and sustainability. With the ongoing development of new targets for 2030, this is an opportune time to explore the changing socio-cultural landscape in which communities and CDDs live in, and call for a multi-level change.

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Appendices

Appendix 1

Tools (English)

In-depth Interview: Community Drug Distributors (CDDs)

ID_____

Time_____

Date_____

Ward_____

Interviewer Name_____

1. Sex: Male   Female
2. Age in Years _____
3. Marital Status
   Single
   Currently Married
   Divorced
   Widow/ widower
4. Religion
   Christian
   Islam
   Non-practicing
   Others, specify _____
5. Level of Education
   Never attended school
   Did not complete primary school
   Completed primary school but did not complete secondary school
   Completed secondary school

Further studies after secondary school

Others, specify_____

6. Main occupation

Farmer

Small business (kiosk, kibanda)

Big business (shop)

Housewife

Salaried worker (teacher, police, chief)

Fisherman

Casual laborer

Others, specify_____

7. Number of years as a CDD for NTD programme _____

8. How did you become a volunteer for the NTD programme? PROBE ON:

- Where did you learn about the possibility to become a CDD?

- Who selected you?

- Did someone help you to get selected?

- Do you know someone who is a CDD? If so, who is this, a friend, relative, or community member?

9. What motivated you to become a volunteer for the NTD programme? PROBE ON:

- Benefits of being a volunteer

- Opportunity for getting other work or job

- What keeps you going?

10. Will you continue to volunteer for MDAs in the future? PROBE ON:

- Why or why not?

11. What are you expected to do before MDA? PROBE ON:

  o Training

  o Sensitization

12. What are you expected to do during MDA? PROBE ON:

- Collecting drugs

- Distributing medicines

- Updating the register

- Updating treatment register

13. What are you expected to do after MDA? PROBE ON:

- Complete tally summary

- Send data to CHEW
- Return the medicines back to my supervisor or the health facility

14. What are some of the reasons why you may not be able to give medicines to members of the household?

15. If a member of the household is not available to receive the medicines, what do you do?

16. If all members of the household are not available to receive the medicines, what do you do?

17. Has it ever taken more than one day to reach a household because of geographic barriers?

18. Have you ever not been able to physically reach a household? If so, why? PROBE ON:
- bad roads
- crossing rivers and bridges
- phone network
- No money for transport

19. If you have to take public transport to a household, what kind of transport do you use and how many hours does it take you?

20. What do you do with the drugs that are left over?

21. Have you ever seen other CDDs selling the medicines? If yes, PROBE ON:
- Why they think other CDDs sell the medicines

22. Where can you ask for help if something is unclear, or if something unexpected happens? PROBE ON:
- Provide an example of a situation where something was unclear or unexpected things happened
- Where, why, how

23. What are the feelings you get as a result of your positive experiences? PROBE ON:
- In what ways do you feel rewarded and appreciated, if at all?

24. What positive things do you experience during MDA? PROBE ON:
- Out of pocket expenses
- Lack of community support, attitudes, and interactions
- Drug replenishment

- Supportive supervision
- Job aids for social mobilization
- Number of households assigned
- Reaching communities
- Compiling reports
- Sending reports to CHEW
- What is the pleasure that CDDs find in their work?

25. What negative things do you experience during MDA? PROBE ON:
- Out of pocket expenses
- Lack of community support, attitudes, and interactions
- Drug replenishment
- Supportive supervision
- Job aids for social mobilization
- Number of households assigned
- Reaching communities
- Compiling reports
- Sending reports to CHEW

26. Please provide me with a detailed description of times when you experienced frustration, exhaustion, and anger during MDA?

27. Please provide me with a detailed description of times when you experienced traumatic events during MDA. PROBE ON:

Having been threatened

Experiencing violence

Observing violence inflicted upon a household or community member

Experiencing theft

Other dangerous situations when moving from house to house

28. What are the negative feelings that you experience as a result of the challenges you just mentioned?

29. Thinking about the last time you participated in MDA, did you spend any of your own money on project activities?
- If yes, how much?
- Can you describe what was bought or paid for? (Do not read list; check all that apply)
  - Stationary

- o Pens/pencils
- o Food
- o Transport
- o Fuel
- o Lodging
- o Cellphone airtime
- o Reporting related costs

30. What incentives do you receive from the NTD program apart from per diem?
PROBE ON:

- Bags, t-shirt, umbrella
- Airtime
- Transport funds
- Lunch funds
- Per diem (how much?)

31. Do you think the per diem and material incentives from the NTD program are enough?

- If no, why not?
- What incentives do you prefer?

32. What actions can the NTD program take to make your job less difficult and stressful; and improve your performance and satisfaction?

In-depth Interview: Community Leaders (Chief or Assistant Chief)

ID_____

Time_____

Date_____

Ward_____

Interviewer Name_____

1. Sex: Male   Female

2. Age in Years _____

3. Marital Status

    Single

    Currently Married

    Divorced

    Widow/ widower

4. Religion

    Christian

    Islam

    Non-practicing

    Others, specify _____

5. Level of Education

    Never attended school

    Did not complete primary school

    Completed primary school but did not complete secondary school

    Completed secondary school

    Further studies after secondary school

    Others, specify_____

6. Main occupation

    Farmer

    Small business (kiosk, kibanda)

    Big business (shop)

    Housewife

    Salaried worker (teacher, police, chief)

    Fisherman

    Casual laborer

    Others, specify_____

7. How are CDDs selected in your community? PROBE ON:

- Do you influence the selection of CDDs
- Do you think that your community has selected the right person as a CDD?
- What do you think are the qualities of a good CDD?

8. What is the role of CDDs in the community? PROBE ON:

- What interactions do the CDDs have with the community before MDA?
- What about during distribution?

9. What do you consider as the main benefit for the community of what the CDDs do?

10. What is the relationship like between CDDs and the communities? PROBE ON:

- What perceptions do the communities have about CDDs?
- What is the perception of CDD performance before and after MDA?
- What motivates CDDs to do the work that they do for the NTD programme?
- What is the level of trust between the community and CDDs?

11. What prevents community members from getting the medicines?

12. What prevents community members from swallowing the medicines after receiving it? PROBE ON:

- What do community members do with the medicines if you don't swallow them?

13. What positive things do CDDs experience before MDA?

14. What positive things do CDDs experience during MDA?

15. What negative things do CDDs experience before MDA?

16. What negative things do CDDs experience during MDA?

17. What recommendations do you have for improving CDD performance and motivation?

Focus Group Discussion: Community Health Extension Workers (CHEWs-Supervisors)

Sub-county:	Moderator:
Ward:	Note taker:
Date of FGD:	Time start:
Location of FGD:	Time stop:
Participants at start	Debrief notes

1. For how long have you been a CHEW?
2. For how long have you worked for the NTD programme?
3. As a CHEW, what is your role in this community?

4. As a CHEW, what is your role in the NTD programme? (**ask about when they undertake these activities**) PROBE ON:

- Training
- Process for supervision of CHVs
- Data reporting
- Assigning CDDs to households

5. What are the current incentives you receive from the NTD program? PROBE ON:

- Bags, t-shirt, umbrella
- Airtime
- Transport funds
- Lunch funds
- Per diem (how much?)
- Salary

PROBE ON: What are your views of these different incentives?

PROBE ON: Are they enough?

6. What incentives do you prefer to receive from the NTD program? **(Probe for reasons for the incentives they prefer)**?

7. What are the current incentives you receive from other health programs?

8. What is the pleasure that CDDs find in their work?

9. What are some of the positive things that CDDs experience during MDA? PROBE ON **(ask for examples)**:

- In what ways do they feel rewarded and appreciated, if at all?

10. What do you think of the workload given to CDDs? PROBE ON:

- Number of households assigned
- Reporting
- Training
- Social Mobilization
- Directly observed treatment

11. What challenges do you face in working with CDDs? PROBE ON:

- Views regarding CDD motivation (**probe for reasons**)
- Views regarding CDD performance (**probe for reasons**)

12. What challenges do you think the CDDs experience during MDA? PROBE ON:

- Out of pocket expenses
- Community support, attitudes, and interactions

- Drug replenishment
- Supportive supervision
- Job aids for social mobilization
- Number of households assigned
- Reaching communities
- Compiling reports
- Sending reports to CHEW

13. Are there times when CDDs experience frustration, exhaustion, and anger during MDA? If so, please provide me with some examples.

14. Are there times when CDDs experience secondary traumatic stress during MDA? If so, please describe examples. PROBE ON:

- Having been threatened
- Experiencing violence
- Observing violence inflicted upon a household or community member
- Experiencing theft
- Other dangerous situations when moving from house to house

15. What are your views regarding incentives for CDDs? (**probe for reasons**) PROBE ON:

- Which incentives do you think they would prefer or improve their motivation and performance?

16. What are your views about feedback and supportive supervision for CDDs during MDA? PROBE ON:

- What is the optimal working relationship that should exist between the health worker and the volunteers to enhance performance of the volunteer? (e.g. supportive supervision)

17. What do you consider to be the main benefit of what CDDs do?

18. What recommendations do you have for enhancing CDD performance and motivation?

Focus Group Discussion: Community Members

Sub-county:	Moderator:
Ward:	Note taker:
Date of FGD:	Time start:
Location of FGD:	Time stop:
Participants at start	Debrief notes

1. What do you know about the NTD programme? PROBE ON:

    • What is LF? What causes LF? How does one know if they have LF? How do you control and prevent LF?

    • Do you think you and your community are at risk?

2. What is MDA?

3. Did you swallow the medicines during the last MDA? (**Count number of people**)

4. What prevents people like you from getting the medicines?

5. What prevents people like you from swallowing the medicines after receiving it? PROBE ON:

    • What do community members do with the medicines if you don't swallow them?

6. How are CDDs selected in your community? PROBE ON:

    • Do you influence the selection of CDDs

    • Do you think that your community has selected the right person as a CDD?

    • What do you think are the qualities of a good CDD?

7. What is the role of CDDs in the community? PROBE ON:

    • What interactions do the CDDs have with the community before MDA?

    • What about during distribution?

8. What do you consider as the main benefit for the community of what the CDDs do?

9. Do you think that the CDDs feel rewarded and appreciated? IF YES, PROBE ON:

    • In what ways do they feel rewarded and appreciated

IF NO: Why do you think that the CDDs do not feel rewarded and appreciated?

10. What is the relationship like between CDDs and the communities? PROBE ON:

- What perceptions do the communities have about CDDs?

- What is the perception of CDD performance before and after MDA?

- What motivates CDDs to do the work that they do for the NTD programme?

- What is the level of trust between the community and CDDs?

11. What positive experiences have you had with CDDs?

12. What negative experiences have you had with CDDs?

13. What positive things do CDDs experience before MDA?

14. What positive things do CDDs experience during MDA?

15. What negative things do CDDs experience before MDA?

16. What negative things do CDDs experience during MDA?

17. What recommendations do you have for improving CDD performance and motivation and engagement with community members?

Key Informant Interviews: Sub-county NTD Program Manager;
District/Municipal Health Officer; MoH Lymphatic Filariasis Focal Point

1. What is your role?
2. Please tell me about MDA planning and implementation. PROBE ON:
   a. Cascade training & national level preparations
   b. Availability of drugs
   c. Health education for the community
   d. Selection of CDDs
   e. Training of CDDs
   f. Data reporting
   g. Number of CDDs assigned to households
   h. Number of CHEWs assigned to CDDs
   i. Distribution days
   j. Supportive supervision
   k. Role of CDDs
   l. Role of CHEWs
3. What is your perception of CDD motivation and performance? PROBE ON:
   • What factors influence their motivation and performance?
   • How does their performance impact the NTD programme?
4. Do you think that CDDs feel rewarded and appreciated by the NTD programme and the community?
5. What do you consider as the main benefit for the community of what the CDDs do?
6. What positive things do CDDs experience during MDA?
7. What challenges does the NTD programme face with CDDs? Please provide examples.
8. What challenges do CDDs experience during MDA? PROBE ON:
   a. Out of pocket expenses
   b. Community support, attitudes, and interactions
   c. Drug replenishment
   d. Supportive supervision
   e. Job aids for social mobilization
   f. Number of households assigned
   g. Reaching communities

      h. Compiling reports

      i. Sending reports to CHEW

9. What factors prevent community members from participating in MDA? PROBE ON:

      a. What about the factors that prevent them from swallowing the medicines?

10. What recommendations do you have for improving CDD performance and motivation?

Cross-sectional Survey for CDDs

1. Ward_____

2. Sex

      a. Male

      b. Female

3. What is your age? _____

4. What is the highest level of education that you completed?

      a. No education

      b. Primary School

      c. Junior High School

      d. Secondary School

      e. Vocational Training

      f. University

      g. Other: _____

5. Are you married?

      a. Yes

      b. No

6. What is your household income per month?

      a. Less than 1000 KSH

      b. Between 1000 and 4000 KSH per month

      c. Between 4000 and 10,000 KSH per month

      d. More than 10,000 KSH per month

      e. I don't know

7. How long have you been a volunteer for the Lymphatic Filariasis program?

      a. Less than 1 year

      b. Between 1 and 3 years

      c. More than 3 years

8. Besides your job as community health volunteer for the NTD program, are you a community health volunteer for other health programs?

      a. Yes

      b. No

9. What motivated you to become a CDD?

      a. To help my community

     b. To help my family

     c. To earn extra income

     d. To learn more about health

     e. I didn't have a choice; I was told I needed to participate

     f. Other: _____

10. Thinking about the last time you participated in MDA, how much of your own money did you spend in total while you were collecting and distributing medicines?

11. Please indicate below the amount of time you spent on NTD program activities in the last distribution period, the total number of days, and the hours per day. The times recorded for each activity should not overlap. If they do (for instance if updating the register and drug distribution are conducted at the same time), then this time should be split between the two categories. If activities take less thank one day to complete (e.g. <8 hours), then record as 1 day.

CDD	Attending Training	Mobilization/Sensitization	Updating Register	Collecting the Drugs	Distributing the Drugs	Preparing Report	Sending Report to CHEW	Other
Total number of days								
Hours per day								
Total Hours								

When you help people get treatment during MDA, you have direct contact with their lives. As you may have found, your work for those you help can affect you in positive and negative ways. I am going to ask you some questions about your experiences, both positive and negative, as a CDD. Consider each of the following questions about you and your current work situation. Select the word that honestly reflects how

frequently you experienced these things in the last MDA. The words are: Never=1, Rarely=2, Sometimes=3, Often=4, or Very Often=5.

Job Satisfaction

1. I get satisfaction from being able to help the community. _____

2. I feel invigorated after working with those I give medicines to. _____

3. I like my work as a CDD. _____

4. I am pleased with how I am able to keep up with MDA protocols. _____

5. My work makes me feel satisfied. ____

6. I have happy thoughts and feelings about those I help and how my role could help them. _____

7. I believe I can make a difference through my work as a CDD. _____

8. I am proud of what I can do to [help] the community. _____

9. I have thoughts that I am a "success" as a CDD. _____

10. I am happy that I chose to do this work. _____

Burnout

11. I am happy. _____

12. I feel connected to others. _____

13. I am not as productive during MDA because I am losing sleep over traumatic experiences of a person I give medicines to. _____

14. I feel trapped by my job as a CDD. _____

15. I have beliefs that sustain me. _____

16. I am the person I always wanted to be. _____

17. I feel worn out because of my work as a CDD. _____

18. I feel overwhelmed because of my responsibilities. _____

19. I feel "bogged down" by the NTD programme. _____

20. I am a very caring person. _____

Secondary Trauma

21. I am preoccupied with more than one person I help._____

22. I jump or am startled by unexpected sounds. _____

23. I find it difficult to separate my personal life from my life as a CDD._____

24. I think that I might have been affected by the traumatic stress of those I give medicines to._____

25. Because of my helping the community, I have felt "on edge" about various things. _____

26. I feel depressed because of the traumatic events I experience or witness during MDA. _____

27. I feel as though I am experiencing the trauma of someone I have helped during MDA. ____

28. I avoid certain activities or situations because they remind me of frightening experiences of the people I help. _____

29. As a result of my [helping], I have intrusive, frightening thoughts. ____

30. I can't recall important parts of my work with the community. _____

Now, I am going to make several statements about your participation and motivation as a CDD. Please select Strongly Agree, Agree, Indifferent, Disagree, or Strongly Disagree as your response.

My role as a CDD is important to the success of the NTD program
Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I feel confident when I carry out NTD program activities
Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I feel I have the tools and job aids need to engage with the community before and during MDA
Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I am satisfied with the training I receive in order to perform my job as a CDD
Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I am satisfied with the incentives that the NTD programme provides me
Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I feel appreciated and supported by the NTD programme
Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

The NTD programme shows very little concern for CDDs
Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

The involvement of CDDs in NTDs enhances health services in this community

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I think that the drugs I give to the community is effective

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

There has been a change in NTDs in my community since I became a CDD

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

The support given by the community is enough motivation

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

To be effective, further support is required from the NTD programme

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I feel supported and appreciated by the community

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I feel supported by my supervisor

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I do not get feedback from my supervisor so it is hard to improve my work

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

My good performance is recognized by my supervisor

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I have clear goals that I work towards during MDA

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

The community trusts me

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

The community thinks that the medicines are safe and effective

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I believe that the community follows my advice on the importance of taking the medicines

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

I feel safe when I go door-to-door to distribute medicines

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

My responsibilities as a CDD do not interfere with my responsibilities at home or my primary job

Strongly Agree=1, Agree=2, Indifferent=3, Disagree=4, or Strongly Disagree=5

Will you participate in the next MDA?

- Yes
- No

How often do people swallow the medicines in front of you?

- a. Always
- b. Sometimes
- c. Never

How often do you do community sensitization and mobilization one week before MDA starts?

- a. Always
- b. Sometimes
- c. Never

Are you able to reach all of the households you are assigned to by the end of MDA?

- a. Always
- b. Sometimes
- c. Never

Key Informant Interviews: Policy Analysis

Actors:

Who were the key actors involved in problem identification and developing strategies through which policy for medicine distribution was developed and implemented?

What role did you play in the policy making process?

Problem Identification

What was the problem and how was it identified?

How did the problem appear on WHO's agenda?

Context

Describe the political, economic, social, and cultural context in which the policy development process started. PROBE ON:

- Situational (e.g. SGD publication, disease burden)
- Structural (e.g. demographic, economy, gdp)
- Cultural (e.g. gender equity agenda)
- What was the position of various actors on the problem?

Process and Content

Describe the process by which the policy was developed. PROBE ON:

- What solutions were proposed to address the problem and who participated in this?
- What research was used to guide the policy?
- What methodological standards were policy makers looking for?
- Which groups were targeted for generating evidence?
- List of documents used in some of the stages of the policy making process
- What other information were considered?
- How did you access the research and documents?
- What documents were produced during the policy development, and policy implementation stages of the policy making process?
- What tensions occurred between international and national actors?
- Who adopted the policy?

Implementation and Evaluation

What was done to carry the policy into effect?

How was effectiveness measured and who evaluated it?

Appendix 2

Tools (Swahili)

Uchunguzi wa kina kwa wasambazaji wa dawa za jamii

1. Kata_____

2. Jinsia

    a. Mume

    b. Mke

3. Uko na miaka? _____

4. Umefikia wapi kielimu uliyohitimu?

    a. Sijapata masomo

    b. Shule ya msingi

    c. Shule ya upili kiwango cha kati

    d. Shule ya upili

    e. Chuo cha ufundi

    f. Chuo Kikuu

    g. Zinginezo: _____

5. Na je,Umeoa/umeolewa?

    a. Ndio

    b. La

6. Na je,mapato yako kwa mwezi ni shilingi ngapi?

    a. Chini ya Ksh.1000

    b. Kati ya Ksh.1000 na Ksh.4000 kwa mwezi

    c. Kati ya Ksh.4000 na Ksh.10,000 kwa mwezi

    d. Zaidi ya Ksh.10,000 kwa mwezi

    e. Sijui

7. Umekuwa mfanyikazi wa kujitolea kwa uratibu wa mpango matende kwa muda gani?

    a. Chini ya mwaka mmoja

    b. Kati ya mwaka 1 na miaka 3

    c.   Zaidi ya miaka 3

8. Kando na kazi yako kama mfanyaikazi wa kujitolea wa afya kwa jamii kwa uratibu wa mpango wa NTD,uko na kazi nyingine tena ya kujitolea kwa uratibu wa mipango mingine?

    a.   Ndio

    b.   La

12. Ni ni kilikusukuma kuwa msambazaji wa madawa kwa jamii?

    a. Ili kusaidia jamii

    b. Ili kusaidia familia

    c. Ili kupata kipato cha ziada

    d. Ili kujifunza zaidi kuhusu afya

    e. Sikuwa na kitu kingine cha kufanya,nikaambiwa nishiriki

    f. Zingine: _____

13. Kuhusiana na wakati wa mwisho ulivyoshiriki katika zoezi la upeanaji wa madawa,ni jumla ya kiwango gani cha pesa zako ulizotumia wakati wa uchukuzi na usambazaji wa madawa?

14. Tafadhali orodhesha hapo chini kiwango cha muda uliotumia wakati wa shughuli za uratibu wa mpango wa NTD kipindi cha mwisho cha usambazaji,idadi ya siku na masaa uliyotumia.Matukio yatakayonakiliwa hayapaswi kugongana.Iwapo yatatokea(mfano wakati wa kujaza rejista na wakati usambazaji wa madawa utafanyika wakati mmoja),kwa hiyo wakati utagawanywa kwa makundi mawili.Iwapo shughuli zitagharimu chini ya siku moja kukamilisha (mfano chini ya masaa 8),basi itanakiliwa kama siku 1.

CDD	Kuhudhuria mafunzo	Uhamasishaji	Kujaza rejista	Kukusanya madawa	Kusambaza madawa	Utengenezaji wa ripoti	Kutumanisha ripoti kwa wauguzi wa afya	Zingine
Jumla ya idadi ya siku								
Masaa kwa								

siku							
Juml a ya mas aa							146

Wakati unaposaidia watu/jamii kupata matibabu wakati wa zoezi la upeanaji wa madawa,huwa unahusiana na maisha yao moja kwa moja.Na kama ulivyogundua,huduma yako kwa wale unaowasaidia huenda ikakuathiri kwa njia nzuri ama njia mbaya.Naenda kukuuliza baadhi ya maswali kuhusiana na tajiriba yako kama mhudumu wa usambazaji wa madawa kwa jamii.Zingatia kila baadhi ya maswali kuhusu wewe na mahali pako pa kazi kwa sasa.Jagua neno ambalo kwa kweli linaangazia matukio uliyopitia wakati wa zoezi la upeanaji wa madawa kwa jamii wakati uliopita.Maneno yenyewe ni : Sijawahi=1,Kwa bahati=2,Wakati mwengine=3,Mara zingine=4 au Kwa mara nyingi=5.

3.Nahisi kutosheka ninaposaidia jamii. _____

6. Na hisi kusisimuka baada ya kufanya kazi na wale ninaowapa madawa. _____

12.Napenda kazi yangu kama mhudumu wa usambazaji wa madawa kwa jamii. _____

16.Napendezwa na jinsi ambavyo nimeweza kujumuiana na itifaki za upeanaji wa madawa kwa jamii.

18. Kaziyanguhunifanyanihisikuridhika. ___

20. Nafurahi na kuwa na hisia njema kuhusu wale ninaowasaidia na jinsi ambavyo majukumu yangu yatawasaidia. _____

22.Naamini nawezaleta msisimko kupitia kwa kazi yangu kama msambazaji wa madawa kwa jamii. _____

24. Najivunia kwa kile ninachofanya kusaidia jamii. ____

27.Nina hakika ya kwamba mimi ni mshindi kama mhudumu wa usambazaji wa madawa kwa jamii. ____

30. Ninafurahayakwambanilichaguakufanyakazihii. _____

1.Ninafuraha. ____

4. Nahisi kuwa nimeungana na wengine. ____

8. Nahisiyakuwasinauzalishajiwakatiwazoezi la upeanaji wamada wakwa jamii kwasaba buna poteza usingi ziju uyahalihalisianayopitiayulenitakayempeaninayempeamadawa. _____

10.Nadhani nimekuwa na shughuli nyingi kama mhudumu wa usambazaji wa madawa. _____

15. Nina matumaini yanayoniwezesha kuendelea

17. Mimi ndiyemtuniliyetakakuwa. ____

19. Nahisi kuchoshwa na kazi yangu kama mhudumu wa usambazaji wa madawa kwa jamii. ____

21. Nahisikuzidiwanakazikwasababuyamajukumuyangu. _____

26. Nahisi kuhusika na uratibu na uiyano wa mpango wa NTD. _____

29. Mimi nimtuwakujalisana. _____

2. Mimi ninazingatiazaidiyamtummojaninayesaidia.____

5. Huwa natamaushwa na sauti nisizotarajia. ____

7.Naonavigumukujitenganishakwamaishayangubinafsinamaishakamamhudumuwaus ambazajiwamadawakwajamii._____

9. Nadhani nimeathiriwa na hali ngumu wanazopitia wale ninaowapa madawa. _____

11.Kwa sababu ya uungaji mkono kwa jamii,nimehisi kugadhabishwa na maswala mengi. _____

13. Nahisi kuvunjika moyo kwa sababu ya matukio ya kukasirisha ninayaona na kukabiliana nayo wakati wa zoezi la upeanaji wa madawa kwa jamii. _____

14.Nahisi ni kama nakabiliana na kugadhabika kwa mtu niliyemsaidia wakati wa zoezi la upeanaji wa madawa kwa jamii. ____

23.Huwa najaribu kuepuka shughuli au matukio fulani kwa sababu hunikumbusha hali za kugadhabisha za wale ninaowasaidia. _____

25. Kwa sababu ya uungaji mkono wangu,huwa nakabiliana na matukio ya kushutua. ____

28. Siwezikumbukasehemumuhimuyakaziyangunajamiihusika. _____

Kwa sasa,nitafanya maelezo kadhaa juu ya kushiriki kwako na motisha wako kama mhudumu wa usambazaji wa madawa kwa jamii.Tafadhali chagua Nakubaliana Kabisa=1, Nakubaliana=2,Haina maana=3,Sikubaliana=4, au Sikubaliani Kabisa=5 kama jibu lako.

1.Jukumulangukamamhudumuwausambazajiwamadawakwajamiinimuhimukwakufaul ukwauratibuwampangowa NTD

2. Ninajiaminiwakatininapofanyakazizauratibuwampangowa NTD

3.Naamini nina raslimali na zana za usaidizi zinazohitajika ili kujumuisha jamii kabla na wakati wa zoezi la upeanaji wa madawa kwa jamii.

4.Nimetoshekanamafunzoninayopataillikufanyakaziyangukamamhudumuwausambaz ajiwamadawakwajamii

5. Nimetoshekanamotishaambaouratibuwampangowa NTD unanipea

6. Nahisi kuungwa mkono na kupendezwa na uiyano wa uratibu wa mpango wa NTD

7.Uratibuwampangowa NTD unaonyeshakutojaliwahudumuwausambazajiwamadawakwajamii

8.
Ushirikawawahudumuwawasambazajiwamadawakwajamiikwauratibuwampangowa NTD huimarishahudumazaafyakatikajamii

9. Nadhani madawa ninayopeana kwa jamii ni salama na yanafaa.

10.Kumekuwanatofautiyamagonjwayaliyopuuzwakatikajamiiyangutangunikuwemhud umuwausambazajiwamadawakwajamii

11. Msaadaunaopeanwanajamiinimotishawakutosha

12. Ili kuwanaufanisi,usaidizizaidiunahitajikakutokakwauratibuwampangowa NTD

13. Nahisi kusaidika na kukubalika na jamii.

14. Nahisikusaidiwanamzimamiziwangu

15. Huwa sipati maoni kutoka kwa msimamizi wangu kwa hivyo ni vigumu kuimarisha/kuboresha kazi yangu

16.Utenda kazi wangu mzuri unatambuliwa na msimamizi wangu.

17. Nina malengo maalum ninayolenga ninapofanyakazi wakati wa zoezi la upeanaji wa madawa kwa jamii

18. Jamii husika huniamini

19. Jamii husika wana imani ya kuwa madawa nisalama na yanafaa

20.Naaminiyakwambajamiihusikahufuatamaagizoyangukuhusuumuhimuwakumezam adawa

21. Najisikianikiwasalamaninapoendanyumbahadinyumbakusambazamadawa

22.Majukumuyangukamamhudumuwausambazajiwamadawakwajamiihuwahayaingili aninamajukumuyanyumbani au kaziyangumuhimu.

23. Na je,utashirikikatikazoezilijalo la upeanajiwamadawakwajamii?

- • Ndio

- • La

Na je,ni mara ngapi watu washawahi meza madawa mbele yako?

- •   a.Kila wakati

- •   b.Wakati mwengine

- •   c.Sijawahi

Na je, ni mara ngapi ushawahi fanya uhamasisho wa uma na kuwarai wiki moja kabla ya zoezi la upeanaji wa madawa kwa jamii kuanza?

- •   a.Kila wakati

- •   b.Wakati mwengine

- •   c.Sijawahi

Na je,waweza kufikia nyumba zote ulizoagizwa mwishoni mwa zoezi la upeanaji wa madawa kwa jamii?

- •   a.Kila wakati

- •   b.Wakati mwengine

- •   c.Sijawahi

In-depth Interview: Community Drug Distributors (CDDs)

ID_____

Time_____

Date_____

Ward_____

Interviewer Name_____

1. Jinsia: Mume   Mke

2. Umri kimiaka _____

3. Hali ya Ndoa

   a. Hujaolewa

b. Umeolewa

c. Umetalakiwa

d. Mjane

4. Dini

    a. Ukristo

    b. Uislam

    c. Kafiri

    d. Zingine,taja_____

5. Kiwango cha elimu

    a. Hakuwahi kuenda shule

    b. Hakuwahi malizia shule ya msingi

    c. Alimaliza shule ya msingi lakini hakumaliza shule ya upili

    d. Alimaliza shule ya upili

    e. Masomo zaidi baada ya shule ya upili

    f. Mengine, taja _____

6. Kazi kuu

    a. Ukulima

    b. Biashara ndogo (kiosk, kibanda)

    c. Biashara kubwa (Duka)

    d. Mke wa nyumbani (Housewife)

    e. Mtajiri aliyeajiriwa (Mwalimu,askari,chifu)

    f. Mvuvi

    g. Kazi ya kibarua

    h. Zengine,taja_____

7. Idadi ya miaka kama msambazaji wa madawa kwa jamii katika uratibu wa mpango wa NTD (Magonjwa yaliyopuuzwa*) _____

8. Na je,ulianzaje kuwa mfanyikazi wa kujitolea katika uratibu wa magonjwa yaliyopuuzwa (NTD)? ULIZIA KUHUSU:

    a. Ulijifunza wapi juu ya uwezekano wa kuwa mhudumu wa usambazaji wa madawa kwa jamii (*Community Drug Distributor*)?

    b. Ni nani aliyekuchagua?

    c. Je, kuna mtu aliyekusaidia kuchaguliwa?

    d. Je,Unajua mtu ambaye ni Mgavi wa Madawa ya Jumuiya? Ikiwa ndio, ni nani, rafiki, jamaa, au mwanachama wa jamii?

9. Nini kilichokuchochea wewe kujitolea kwa uratibu wa mpango wa NTD? ULIZIA KUHUSU:

   a. Faida/Manufaa ya kujitolea
   b. Fursa ya kupata kazi nyingine au kazi
   c. Ni nini hasa hukuchochea kuendelea na hali hiyo?

10. Je Utaendelea kujitolea katika zoezi la upeanaji wa madawa kwa jamii (MDAs) wakati ujao?ULIZIA KUHUSU:

   • Kwa nini?

11. Unatarajiwa kufanya nini kabla ya zoezi la upeanaji wa madawa kwa jamii (MDA)? ULIZIA KUHUSU:

   • Mafunzo
   • Kuhamasisha/Uhamasishaji

12. Unatarajiwa kufanya nini wakati wa zoezi la upeanaji wa madawa kwa jamii (MDA)?:

   • Kukusanya madawa
   • Kusambaza madawa
   • Kuboresha rejista
   • Kuboresha usajili wa matibabu

13. Unatarajiwa kufanya nini baada ya zoezi la upeanaji wa madawa kwa jamii (MDA)? ULIZIA KUHUSU:

   • Muhtasari kamili wa tale (*Tally summary*)
   • Kutuma takwimu kwa Mfanyakazi wa Upanuzi wa Afya ya Jamii
   • Rudisha/Regesha madawa kwa mzimamizi wangu au katika kituo cha afya

14. Ni zipi baadhi ya sababu zinazokuzuia kupeana madawa kwa wahusika wa jamii?

15. Iwapo au Ikiwa mhusika wa jamii hayuko ili kupokea madawa,huwa wafanya nini?

16. Ikiwa au Iwapo wahusika wote wa jamii hawapo ili kupokea madawa,huwa wafanya nini?

17. Na je,ishawahi gharimu zaidi ya siku moja kufikia mhusika katika jamii kwa sababu ya vizuizi vya pahali (*kijiogirafia*)?

18. Na je,ushawahi shindwa kufikia jamii? Ikiwa ndio,ni kwa nini? ULIZIA KUHUSU:

   • Barabara mbaya
   • Kuvuka mito na daraja
   • Mawasiliano ya simu

- Ukosefu wa pesa za usafiri

19. Iwapo utachukua usafiri wa kawaida hadi kwa nyumba,ni aina gani ya usafiri huwa watumia na utakugharimu masaa mangapi?

20. Na je, huwa wafanya nini na madawa yanapobaki?

21. Na je,ushawahi kuona wasambazaji wa madawa kwa jamii wakiuza madawa? Ikiwea ni Ndio,ULIZIA KUHUSU:

- Kwa nini wanadhani wahudumu wengine wa usambazaji wa madawa kwa jamii wanauza madawa

22. Na je,ni wapi unaweza kuomba msaada ikiwa kuna kitu hakijulikani, au ikiwa kuna jambo lisilotarajiwa? ULIZIA KUHUSU:

- Elezea mfano wa hali ambapo kitu kilikuwa hakijulikani au mambo yasiyotarajiwa yalitokea
- Wapi, kwa nini, jinsi gani

23. Je Ni hisia zipi unazopata kutokana namatokeo ya uzoefu wako mzuri? ULIZIA KUHUSU:

- Je, ni kwa njia gani unahisi kutuzwa na kukubaliwa?

24. Je, ni mambo gani mazuri unayopata wakati wa zoezi la upeanaji wa madawa kwa jamii (MDA)?ULIZIA KUHUSU:

- Gharama za kibinafsi (*Out of pocket expenses*)
- Ukosefu wa usaidizi wa jamii, mitazamo, na ushirikiano
- Kujaza/kuongezea madawa
- Usimamizi wa kuunga mkono
- Msaada wa ajira kwa ajili ya uhamasishaji wa kijamii
- Idadi ya nyumba/kaya zilizopewa
- Kufikia jamii
- Kuandaa ripoti
- Kutuma ripoti kwa wafanyakazi wa ugani wa Afya ya Jamii (*CHEW*)
- Je, ni furaha gani wasambazaji wa dawa za jamii hupata kutokana na kazi yao?

25. Je Ni mambo gani mabaya unayoyaona wakati wa zoezi la upeanaji wa madawa kwa jamii (MDA)?ULIZIA KUHUSU:

- Gharama za kibinafsi (*Out of pocket expenses*)
- Ukosefu wa usaidizi wa jamii, mitazamo, na ushirikiano

- Kujaza/kuongezea madawa
- Usimamizi wa kuunga mkono
- Msaada wa ajira kwa ajili ya uhamasishaji wa kijamii
- Idadi ya nyumba/kaya zilizopewa
- Kufikia jamii
- Kuandaa ripoti
- Kutuma ripoti kwa Wafanyakazi wa Ugani wa Afya ya Jamii (*CHEW*)

26. Tafadhali nipatie maelezo ya kina ya nyakati ulipopata kuchanganyikiwa, uchovu, na hasira wakati wa zoezi la upeanaji wa madawa kwa jamii (MDA)?

27. Tafadhali nipatie maelezo ya kina ya matukio mabaya wakati wa zoezi la upeanaji wa madawa kwa jamii (MDA)ULIZIA KUHUSU:

- Baada ya kutishiwa
- Kushuhudia vurugu
- Kushuhudia vurugu zilizopata mwanachama wa familia au jamii
- Kushuhudia wizi
- Hali nyingine hatari wakati wa kuzungukia nyumba hadi nyumba

28. Je, ni hisia zipi mbaya ambazo umeshuhudia kutokana na changamoto ulizotaja?

29. Kuhusu wakati wa mwisho ulioshiriki katika Utawala wa Madawa ya Misa (MDA), je, ulijitumia pesa yako mwenyewe kwenye shughuli za mradi?

- Kama ndiyo, ni kiasi gani?
  - Je! Unaweza kuelezea ni nini kilichonunuliwa au kulipiwa? (Usisome orodha, angalia yote yanayotumika)
  - Stationary
  - Kalamu za wino/kalamu za risasi
  - Chakula
  - Uchukuzi
  - Mafuta ya gari
  - Uhifadhi
  - Matumizi ya simu ya mkono
  - Gharama za kuhusiana na taarifa

30. Je! Ni motisha gani unaopokea kutoka kwa uratibu wa mpango wa NTD kando na malipo ya kawaida?

- Mifuko, t-shati, mwavuli
- Ada ya matumizi ya simu ya mkono (*Airtime*)

- Fedha/Pesa za Usafiri
- Fedha /Pesa za chakula cha mchana
- Malipo ya kawaida (*Per diem*)(Ngapi?)

31. Je, unadhani malipo na hali zingine za kushawishi kutokana na uratibu huu wa mpango wa NTD unatosha?

- Ikiwa ni LA,kwa nini?
- Je,ungependelea nini?

32. Ni hatua gani ambazo uratibu wa mpango wa NTD unaweza kuchukua ili kufanya kazi yako kuwa rahisi bila shida; na kuboresha utendakazi na kuridhika?

In-depth Interview: Community Leaders (Chiefs)

ID_____

Time_____

Date_____

Ward_____

Interviewer Name_____

1. Jinsia: Mume   Mke
2. Umri kimiaka _____
3. Hali ya Ndoa
    a. Hujaolewa
    b. Umeolewa
    c. Umetalakiwa
    d. Mjane
4. Dini
    a. Ukristo
    b. Uislam
    c. Kafiri
    d. Zingine,taja_____
5. Kiwango cha elimu

a. Hakuwahi kuenda shule

b. Hakuwahi malizia shule ya msingi

c. Alimaliza shule ya msingi lakini hakumaliza shule ya upili

d. Alimaliza shule ya upili

e. Masomo zaidi baada ya shule ya upili

f. Mengine, taja _____

6. Kazi kuu

a. Ukulima

b. Biashara ndogo (kiosk, kibanda)

c. Biashara kubwa (Duka)

d. Mke wa nyumbani (Housewife)

e. Mtajiri aliyeajiriwa (Mwalimu,askari,chifu)

f. Mvuvi

g. Kazi ya kibarua

h. Zengine,taja_____

7. Je Wasambazaji wa Madawa ya Jamii huchaguliwa vipi katika kijiji chako?ULIZIA KUHUSU:

- Je,Unaathiri uteuzi wa wasambazaji wa dawa za jamii?

- Je,Unafikiria kuwa jumuiya yako imechagua mtu mzuri kama mgavi wa madawa ya Jamii?

- Je,Unadhani ni sifa gani za msajili mzuri wa usambazaji wa madawa za jamii?

8. Je Ni lipi jukumu la msambazaji wa dawa za jamii katika jamii?ULIZIA KUHUSU:

- Na je,Kuna uhiano gani baina ya wasambazaji wa dawa za jumuiya na jamii kabla ya upeanaji wa madawa kwa halaiki?

- Na je,wakati wa usambazaji?

9. Je Ni zipi unazodhani kuwa faida kuu kwa jamii kuhusiana na utenda kazi wa wasambazaji wa dawa za jamii?

10. Na je,Ni uhusiano upi uliopo kati ya wasambazaji wa dawa za jamii na jamii?ULIZIA KUHUSU:

- Ni yapi maoni ya jamii husika kuhusu wasambazaji wa madawa ya jamii?

- Je! Ni upi mtazamo wa utendakazi wa wasambazaji wa madawa ya jamii kabla na baada ya hulka ya upeanaji wa madawa (*MDA*)?

- Ni nini hasa kinachochea wasambazaji wa madawa ya jamii kufanya kazi wanayofanya kwa uratibu wa mpango wa magonjwa yaliyopuuzwa (*NTD Programme*)?
- Je! Kuna kiwango gani cha uaminifu kati ya wasambazaji wa madawa ya jamii na jamii husika?

11. Ni nini kinachozuia washiriki wa jamiihusika kutopata dawa?

12. Ni nini kinachozuia washiriki wa jamii husika kususia kumeza dawa baada ya kupokea?ULIZIA KUHUSU:

- Je! Washiriki wa jamii husika hufanya nini na dawa hizo mnaposusia kuzimeza?

13. Je! Ni mambo gani mazuri wasambazaji wa madawa wanayoshuhudia kabla ya zoezi la upeanaji wa madawa?

14. Je Ni mambo gani mazuri wasambazaji wa madawa wanayoshuhudia wakati wa zoezi la upeanaji wa madawa?

15. Je Ni mambo gani mabaya wasambazaji wa madawa wanayoshuhudia kabla ya zoezi la upeanaji wa madawa?

16. Je Ni mambo gani mabaya wasambazaji wa madawa wanayoshuhudia wakati wa zoezi la upeanaji wa madawa?

17. Ni yapi mapendekezo yako kuhusu kuboresha utendakazi na motisha wa wasambazaji wa madawa kwa jamii?

In-depth Interview: Community Health Extension Workers (CHEWs)

ID_____

Time_____

Date_____

Ward_____

Interviewer Name_____

1. Umekuwa mfanyakazi wa upanuzi wa Afya ya jamii kwa muda gani (CHEW)?

2. Umekuwa mfanyi kazi wa uratibu wa mpango wa NTD?

3. Kama mfanyakazi wa ugani wa Afya ya jamii, jukumu lako ni lipi katika jamii hii?

4. Kama mfanyakazi wa ugani wa Afya ya jamii, jukumu lako ni lipi katika uratibu wa mpango wa magonjwa yaliyopuuzwaa ? (**haya uliza wakati wanapotekeleza majukumu**)ULIZA KUHUSU:

- Mafunzo

- Mchakato wa usimamizi wa CHVs

- Taarifa ya takwimu

- Kuweka wasambazaji wa madawa ya jamii kwa kaya/nyumba za jamii husika

5. Je! Ni motisha gani unaopokea kutoka kwa uratibu wa mpango wa NTD? ULIZIA KUHUSU:

- Mifuko,t-shati,mwavuli

- Ada ya simu ya mkono (*Airtime)*

- Malipo ya uchukuzi

- Malipo ya chakula

- Malipo ya kawaida (*Per diem*) (ngapi?)

- Mshahara

ULIZA KUHUSU: Je, ni yapi maoni yako kuhusu tofauti zilizopo katika motisha hizi?

ULIZA KUHUSU: Na je,zinatosha?

6. Ni motisha upi ungependelea kupokea kutoka kwa uratibu wa mpango wa magonjwa yaliyopuuzwa?(**Ulizia sababu za kupendekeza motisha huo**)

7. Ni motisha upi wa hivi punde unaopokea kutoka kwa uratibu wa mpango mwengine wa afya?

8. Ni radhi/raha ipi wasambazaji wa madawa ya jamii wanayopata kwa kazi yao?

9. Ni mambo yapi mazuri wasambazaji wa madawa ya jamii wanayoshuhudia wakati wa hulka ya upeanaji wa madawa jamii?ULIZIA KUHUSU(**ulizia mifano**):

- Ni kwa njia gani hasa wanahisi kuwatuzwa na kupokelewa,iwapo ipo?

10. Ni yapi mawazo yako kuhusiana na kipimo cha kazi wanachopewa wasambazaji wa madawa kwa jamii husika?ULIZIA KUHUSU:

- Idadi ya kaya/nyumba zilizopeanwa

- Upeanaji wa taarifa

- Mafunzo

- Uhamasishaji wa jamii

- Ufuatiliaji wa matibabu

11. Ni changamoto zipi unazokabiliana nazo unapofanya kazi na wasambazaji wa madawa ya jamii katika jamii husika?ULIZIA KUHUSU:

- Maoni kuhusu motisha wa wasambazaji wa madawa ya jamii (**ulizia sababu**)
- Maoni kuhusu utendakazi wa wasambazaji wa madawa ya jamii (**ulizia sababu**)

12. Ni changamoto zipi unazofikiria huwapata wasambazaji wa madawa ya jamii wakati wa hulka ya upeanaji wa madawa?ULIZIA KUHUSU:

- Gharama za kibinafsi (*Out of pocket expenses*)
- Ukosefu wa usaidizi wa jamii, mitazamo, na ushirikiano
- Kujaza/kuongezea madawa
- Usimamizi wa kuunga mkono
- Msaada wa ajira kwa ajili ya uhamasishaji wa kijamii
- Idadi ya nyumba/kaya zilizopewa
- Kufikia jamii
- Kuandaa ripoti
- Kutuma ripoti kwa wafanyakazi wa ugani wa Afya ya Jamii (CHEW)

13. Na je,kuna wakati wasambazaji wa madawa ya jamii huhisi kuchanganyikiwa,kuchoka au kukasirika wakati wa hulka wa upeanaji wa madawa?

14. Na je,kuna wakati ambapo wasambazaji wa madawa ya jamii hupokea vitisho wakati wa hulka ya upeanaji wa madawa? Ikiwa ndio,tafadhali elezea ukipeana mifano. ULIZIA KUHUSU:

- Kupokea vitisho
- Kushuhudia vurugu
- Kushuhudia vurugu katika nyumba/kaya kwa jamii husika
- Kushuhudia uwizi
- Kushuhudia matukio ya hatari wakati wa kutembelea kaya/nyumba za jamii husika

15. Ni yapi maoni yako kuhusu motisha unaopewa wasambazaji wa madawa ya jamii? (**ulizia sababu**)ULIZIA KUHUSU:

- Unafikiri wanaezapendelea nini kama motisha ili kuimarisha utendakazi wao?

16. Ni yapi maoni yako kuhusu usimamizi na uungaji mkono wa wa wasambazaji wa madawa kwa jamii wakati wa hulka ya upeanaji madawa?ULIZIA KUHUSU:

- Ni kiwango kipi cha uhusiano kinachofaa kudumu kati ya mfanyi kazi wa afya na wafanyikazi wa kujitolea ili kuimarisha utendakazi kwa wafanyikazi wa kujitolea? (mfano usimamizi wa uungaji mkono)

17. Ni lipi unalochukulia kuwa la faida kuhusiana na kazi wanayofanya wasambazaji wa madawa ya jamii?

18. Ni yapi mapendekezo yako kuhusiana na uimarishaji wa utendakazi wa wasambazaji wa madawa ya jamii?

Focus Group Discussion: Community Members

Sub-county:	Moderator:
Ward:	Note taker:
Date of FGD:	Time start:
Location of FGD:	Time stop:
Participants at start	Debrief notes

1. Nini hasa unalojua kuhusu uratibu wa mpango wa NTD? ULIZIA KUHUSU:

- Ugonjwa wa matende ni nini?Ni nini husababisha ugonjwa wa matende?Mtu hujuaje ana ugonjwa wa matende?Na unaweza kuzuia na kujikinga vipi?
- Na je,kwa maoni yako unaona jamii yako iko katika hatari ya maambukizi?

2. Zoezi la upeanaji wa madawa kwa jamii ni nini (*MDA*)?

3. Na je ulimeza dawa wakati wa zoezi la upeanaji wa madawa kwa jamii wakati uliopita? (**Hesabu idadi ya watu**)

4. Ni nini huzui watu kama wewe kutopata madawa?

5. Ni nini huzui watu kama wewe kutomeza madawa baada ya kupewe? ULIZIA KUHUSU:

- Na je,jamii husika hufanya nini na madawa usipoyameza?

6. Na je,wasambazaji wa madawa huchaguliwaje? ULIZIA KUHUSU:

- Na je,unaathiri uteuzi wa wasambazaji wa madawa ya jamii

- Na je,unafikiria kuwa jamii yako imechagua mtu mzuri kama mhudumu wa usambazaji wa madawa kwa jamii?

- Na je,unadhani ni sifa gani nzuri za msajili wa madawa ya jamii?

7. Je,Ni lipi jukumu la msamabazaji wa madawa ya jamii katika jamii? ULIZIA KUHUSU:

- Kuna ushirikiano gani kati ya wasambazaji wa madawa ya jamii na jamii husika kabla ya zoezi la upeanaji wa madawa?

- Na je,wakati wa usambazaji?

8. Ni nini unalofikiria kuwa la manufaa kwa jamii husika kutokana na utendakazi wa wasambazaji wa madawa?

9. Na je,kwa maoni yako unahisi ya kuwa wasambazaji wa madawa kwa jamii wanatuzwa na kuheshimiwa? Ikiwa Ndio,ULIZIA KUHUSU:

- Ni kwa njia gani huwa wanahisi kutuzwa na kuheshimiwa

IKIWA LA: Ni kwa nini unadhani wasambazaji wa madawa kwa jamii huwa hawahisi kutuzwa na kuheshimiwa?

10. Kuna uhusiano gani kati ya wasambazaji wa madawa kwa jamii na jamii husika? ULIZIA KUHUSU:

- Ni upi mtazamo wa jamii kuhusiana na wasamazaji wa madawa kwa jamii?

- Ni upi mtazamo wa utendakazi wa msambazaji wa madawa kwa jamii kabla na baada ya zoezi la upeanaji wa madawa?

- Ni nini huchochea wasambazaji wa madawa kwa jamii kufanya kazi wanayofanya kwa uratibu wa mpango wa magonjwa?

- Kuna kiwango gani cha uaminifu kati ya jamii husika na wasambazaji wa madawa kwa jamii?

11. Je,ni uzoefu gani mzuri uliokuwa nao kuhusiana na wasambazaji wa madawa kwa jamii?

12. Je,ni uzoefu gani mbaya uliokuwa nao kuhusiana na wasambazaji wa madawa kwa jamii?

13. Je,ni mambo mazuri gani ambayo wasambazaji wa madawa kwa jamii hufanya kabla ya zoezi la upeanaji wa madawa?

14. Je,ni mambo mabaya gani ambayo wasambazaji wa madawa kwa jamii hufanya wakati wa zoezi la upeanaji wa madawa?

15. Je,ni mambo mabaya gani ambayo wasambazaji wa madawa kwa jamii hufanya kabla ya zoezi la upeanaji wa madawa?

16. Je,ni mambo mabaya gani ambayo wasambazaji wa madawa kwa jamii hufanya wakati wa zoezi la upeanaji wa madawa?

17. Uko na mapendekezo gani kuhusu uimarishaji wa utendakazi wa wasambazaji wa madawa kwa jamii na jamii husika?

Key Informant Interviews: Policy Analysis

Actors:

Who were the key actors involved in problem identification and developing strategies through which policy for medicine distribution was developed and implemented?

What role did you play in the policy making process?

Problem Identification

What was the problem and how was it identified?
How did the problem appear on WHO's agenda?

Context

Describe the political, economic, social, and cultural context in which the policy development process started. PROBE ON:

- Situational (e.g. SGD publication, disease burden)
- Structural (e.g. demographic, economy, gdp)
- Cultural (e.g. gender equity agenda)
- What was the position of various actors on the problem?

Process and Content

Describe the process by which the policy was developed. PROBE ON:

- What solutions were proposed to address the problem and who participated in this?
- What research was used to guide the policy?
- What methodological standards were policy makers looking for?

- Which groups were targeted for generating evidence?

- List of documents used in some of the stages of the policy making process

- What other information were considered?

- How did you access the research and documents?

- What documents were produced during the policy development, and policy implementation stages of the policy making process?

- What tensions occurred between international and national actors?

- Who adopted the policy?

Implementation and Evaluation

What was done to carry the policy into effect?

How was effectiveness measured and who evaluated it?

Appendix 3

Measures	Summary	Specific issues of relevance
Constitution of Kenya, 2010	Gives every Kenyan a right to the highest attainable standard of health, and says no person should be denied access to emergency treatment (Section 43).	Health services devolved to counties. However, policy development and standards remain a national function.
Health Bill, 2016	Establishes a health system that encompasses the public and private sectors and the national and county governments. It harmonizes fragmented legislation governing the health sector.	The Bill defines roles of county and national governments, and allocates PHC functions fully to county governments.
Kenya Vision 2030	Kenya's development blueprint to turn the country into a globally competitive middle-income country by 2030. Specifies economic, social and political pillars that will drive the country towards realizing the goal.	Two approaches identified as key in pushing the agenda of an efficient health system: devolution of funds and management to counties, and shifting the bias of national health from curative to PHC.
Second Medium-Term Plan (MTP), 2013–2017	The second MTP identifies key policy actions, reforms, and programmes that the Jubilee Government will implement between 2013 and 2017 in line with its pre-election pledges, key Vision 2030 priorities and the Constitution.	The MTP emphasizes devolution, and plans for scale-up of PHC interventions, including maternal, neonatal and child health, strengthening staff capacity, strengthened linkages between communities and facilities, and strengthened community awareness of health rights, nutrition and sanitation.
Kenya Health Policy, 2014–2030	The main aims of the policy are to realize the priorities and flagship projects set out in Vision 2030, and to move towards making the right to health for all Kenyans a reality.	The Kenya Health Policy identifies key areas of focus for the policy period. These include reducing the burden of communicable and noncommunicable diseases through, among other strategies, strengthening PHC.
Kenya Health Sector Strategic and Investment Plan III, 2013–2017	Guides allocation of resources in the Medium-Term Expenditure Framework, and in turn informs annual planning. The plan provides the overall framework for sector guidance in the medium term. It is complemented by a series of sector documents.	The plan classifies health care facilities into levels (from level 1 – community, to level 6 – national referral). PHC facilities fall in levels 2 and 3 (dispensaries and health centres), complemented by the community level. It defines services to be provided at each level.
Ministry of Health norms and standards	Defines the staffing norms and standards for facilities at each level of the health system. Meant to be the minimum standards to assure high-quality services.	PHC facility staffing requirements outlined. These include clinical staff, pharmaceutical staff, nursing staff and support staff requirements.
Patient charters	Policy documents aimed at improving client-centredness across the health systems through entrenching social accountability.	Outlines the rights and responsibilities of patients, and what PHC facilities must guarantee. Emphasizes the need for collecting and responding to client concerns.
Guidelines for Referral of Patients	The referral guidelines outline how needs of patients should be met beyond the capacity and capabilities of the respective health care levels.	The guidelines define the scope of referral services to include movement of clients, specimens, services and experts, and client parameters (movement of client information to higher levels for expert opinion). PHC facilities to focus on preventive and basic curative services.
Kenya Quality Model for Health (KQMH)	The KQMH is the overall framework guiding quality management and continuous quality improvement activities within the Kenyan health care system.	The KQMH defines health care standards to be met by facilities offering various services. It proposes adoption of continuous quality improvement activities through entrenching approaches such as 5S and the Kaizen model.

Policies and Guidelines Governing Health Services in Kenya

Source: World Health Organization, 2007
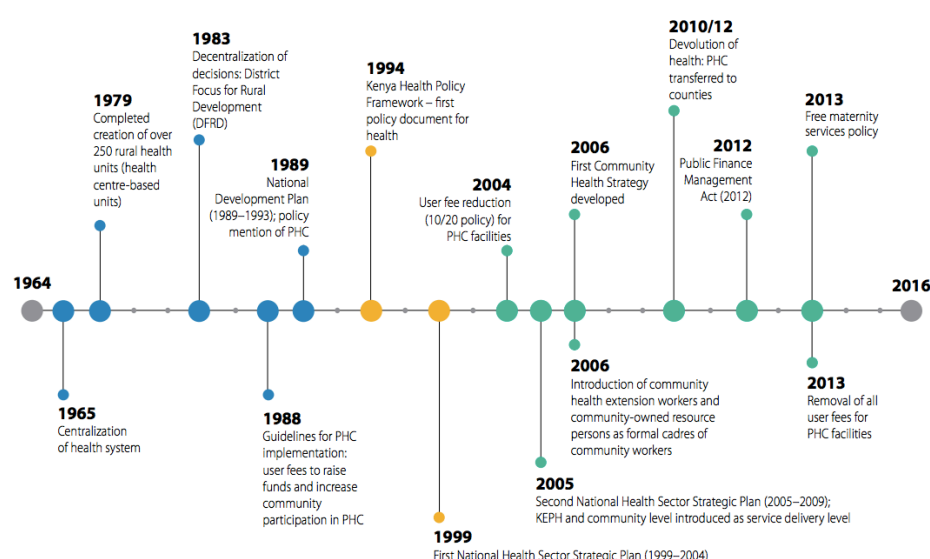
Timeline of Key Milestones in the Evolution of Primary Health Care in Kenya Post-Independence

Source: World Health Organization, 2017