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Comparing cost to participate as community drug distributor (CDD) in mass drug administration for preventive chemotherapy of onchocerciasis and lymphatic filariasis in an urban and a rural district in Côte d'Ivoire

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By

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B.S. Economics
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2020

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Abstract

Comparing cost to participate as community drug distributor (CDD) in mass drug administration for preventive chemotherapy of onchocerciasis and lymphatic filariasis in an urban and a rural district in Côte d'Ivoire

By: Adolfo Hassan

Mass drug administration (MDA) programs are essential in combating neglected tropical diseases (NTDs) in low-resource settings. Community drug distributors (CDDs) play a critical role in the successful implementation of MDA programs. This study aims to investigate the opportunity costs faced by CDDs in urban and rural districts of Côte d'Ivoire and assess the relationship between these costs and the duration of volunteer service (retention) in the program. Data was collected through a survey of CDDs in an urban (n=76) and a rural (n=60) district, capturing demographics, education, occupation, hours spent on MDA activities, out-of-pocket expenditures, and monetary incentives. The opportunity cost was derived as the net cost to participate, using both self-reported income and minimum wage data. Welch Two Sample t-tests were performed to assess the differences in net costs between urban and rural CDDs, and an ordinal logistic regression model was fitted to examine the relationship between the duration of volunteer service and net cost. The results show significant differences in net costs between urban and rural CDDs using both self-reported income (p-value < 0.001) and minimum wage data (p-value $= 0.002$). Urban CDDs faced higher net costs, indicating a greater opportunity cost to participate in MDA programs. The ordinal logistic regression model revealed a significant negative relationship between net cost and duration of volunteer service (p-value < 0.001), suggesting that higher net costs are associated with decreased odds of CDDs staying in the program for a longer duration. These findings highlight the importance of understanding the opportunity costs faced by CDDs and their impact on retention in MDA programs. Policymakers and program implementers should consider measures to minimize opportunity costs, such as providing adequate compensation and support, to enhance CDD retention and ensure the success of MDA programs in controlling and eliminating NTDs.

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I extend my eternal gratitude to the lessons I have learned, the growth I have experienced, and the person I have become. Today I stand stronger, more resilient, and more compassionate.

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Chapter 1: Introduction

1.1 Overview

Community drug distributors (CDDs) play a vital role in the success of mass drug administration (MDA) programs for neglected tropical diseases (NTDs), by acting as the direct link between the community and the program, ensuring that at-risk individuals receive the necessary treatment (World Health Organization, 2017). The literature shows that the involvement of CDDs in MDA programs for NTDs has led to a drastic reduction in the cost of elimination and control of NTDs (Coffeng et al., 2013). CDDs have multiple roles in MDA programs, including identifying eligible individuals, distributing drugs, reporting on program progress, creating community awareness, and promoting adherence to treatment (Fleming et al., 2016). However, the experiences of CDDs in urban and rural settings differ significantly as urban CDDs face unique challenges that can make their work more difficult (Adams et al., 2018). CDDs in urban areas are challenged by complex urban governance structures, while high population density and heterogeneous populations in urban areas can render it difficult for CDDs to reach all eligible individuals (Atkinson et al., 1994). Urban mobility also poses a challenge, as individuals may move frequently and be more difficult to track (Odhiambo et al., 2016). Additionally, urban populations may have lower trust in institutions, which can make it harder for CDDs to gain their acceptance and cooperation (Odhiambo et al., 2016). These factors can make it harder for urban CDDs to achieve high coverage rates and successful program implementation.

The cost of participating in mass drug administration (MDA) programs for neglected tropical diseases (NTDs) is a significant factor that affects the ability of CDDs to volunteer (Fleming et al., 2016). Studies have shown that the challenges faced by urban CDDs, such as

complex urban governance, heterogeneous population, urban mobility, and lower trust in institutions, could potentially make it more difficult and costlier for them to participate in these programs. For example, research has found that urban CDDs often must travel greater distances to reach their target population, which increases their transportation costs (Agboraw et al., 2021). Additionally, the higher cost of living in urban areas can put urban CDDs at odds with other employment opportunities, as they may have to forego higher wages in order to comply with programmatic activities

1.2 Purpose Statement

This thesis project aims to examine whether there is a difference in the community drug distributors opportunity cost between Mass Drug Administration programs in urban and rural areas, and the potential effects this difference could have on CDD retention.

1.3 Hypotheses

Question I: Are there significant differences in the opportunity costs faced by community drug distributors when participating in mass drug administration programs in an urban and a rural district of Côte d'Ivoire?

Null Hypothesis I: There are no significant differences in the opportunity costs faced by community drug distributors when participating in mass drug administration programs in an urban and a rural district of Côte d'Ivoire.

Question II: Is there a relationship between the duration of volunteer service as a community drug distributor (retention) and the net cost incurred by CDDs?

Null Hypothesis II: There is no relationship between the duration of volunteer service as a community drug distributor and net cost incurred by CDDs

1.4 Significance

The significance of this thesis project lies in its potential to shed light on the differences in costs between rural and urban CDD participation in MDA programs. The findings of this study will be useful to program managers and policymakers who are involved in the design and implementation of MDA programs for NTDs in urban areas. Understanding these cost differences can provide valuable insight into the feasibility and delivery of MDA programs in urban settings. Additionally, identifying the factors that affect CDDs' participation in NTD programs can help develop strategies for improving retention and recruitment of CDDs and ultimately resulting in better program outcomes.

Chapter 2: Literature Review

2.1 Lymphatic Filariasis

Lymphatic filariasis (LF) is a parasitic disease caused by the filarial parasites Wuchereria bancrofti, Brugia malayi, or Brugia timori, and transmitted by mosquito vectors (de Souza et al., 2012). In West Africa, Anopheles mosquitoes, which also transmit malaria, are the primary vectors of LF (de Souza et al., 2012). The Global Programme for the Elimination of Lymphatic Filariasis (GPELF) has developed a strategy based on mass drug administration (MDA) using Albendazole and either diethylcarbamazine (DEC) or Ivermectin to reduce circulating microfilariae below a threshold level and interrupt transmission by disease vectors (Taylor et al., 2010).

Before the implementation of MDA programs, approximately 129 million people were infected with LF, with 43 million displaying clinical manifestations of the disease, which corresponds to a disability-adjusted life year (DALY) burden of 5.25 million (Mathew et al., 2020). LF can lead to acute and chronic diseases, such as acute inflammation, hydrocele, lymphedema, and elephantiasis (Molyneux & Taylor, 2001). Although LF is not fatal, it is one of the leading causes of permanent and long-term disability worldwide (Brantus, 2009). LF morbidity often presents as painful and disfiguring chronic manifestations, including lymphedema (acute dermatolymphangioadenitis—ADLA and elephantiasis) and male urogenital disease (hydrocele and lymph scrotum) (Medeiros et al., 2021). Advanced lymphedema or elephantiasis, a chronic condition caused by lymphatic dysfunction, disproportionately affects women more frequently than men in many parts of the world (Medeiros et al., 2021).

Despite the progress made in interrupting transmission, LF morbidity management and disability prevention (MMDP) activities have lagged behind, leaving many individuals suffering from the disabling and stigmatizing effects of lymphedema and elephantiasis (Stocks et al., 2015). Proper management of ADLA is crucial to alleviate the symptoms and prevent progression of the condition (Medeiros et al., 2021).

The World Health Organization (WHO) recommends a minimum of five years of annual MDA at 65% coverage to reduce transmission of LF (Davis et al., 2021). Nearly 900 million people worldwide are at risk of infection, and LF has been targeted for elimination as a public health problem by 2030 (Davis et al., 2021). Modeling the impact of vector control on LF programs is essential to understand current approaches and limitations (Davis et al., 2021).

2.2 Urban Lymphatic Filariasis

Urban lymphatic filariasis (LF) is a significant public health concern, particularly in impoverished areas with poor sanitation and overcrowding (Terranella et al., 2006). Although studies on urban LF are relatively scarce, existing research indicates that the proliferation of Culex quinquefasciatus mosquitoes in polluted water bodies is a key driver of LF transmission in urban environments (Simonsen et al., 2013). Unplanned urban areas with inadequate sanitary, drainage, and sewerage facilities often provide favorable breeding conditions for these mosquitoes, leading to extremely high biting rates (Simonsen et al., 2013).

Moreover, the less privileged segments of urban populations are often more exposed to the risk factors associated with LF transmission, due to the concentration of poor conditions within specific localities (Simonsen et al., 2013). While urban residents may be less exposed to the injuries that contribute to the development of elephantiasis compared to their rural

counterparts, the persistence of poor sanitation and overcrowding in certain urban areas perpetuates the risk of LF infection (Simonsen et al., 2013; Terranella et al., 2006).

Urban LF has been documented in countries such as Brazil and India, but there is limited knowledge about the disease in other endemic regions (Terranella et al., 2006). Additionally, most research has focused on large megacities, with few studies addressing the smaller and medium-sized cities that now have the highest potential for growth (Simonsen et al., 2013).

Perception of being at risk of infection among high socio-economic groups in urban areas has been found to be low in several studies (Njomo et al., 2014). CDDs' failure to visit households to issue drugs, attributable to factors such as an inadequate number of CDDs and a limited distribution period, has also been identified as a challenge (Njomo et al., 2014).

Successful MDA campaigns in urban areas are highly dependent on factors such as leadership, funding, planning, and community involvement (Biritwum et al., 2017). A substantial lack of knowledge, low risk perceptions, and understanding of LF and its control among urban respondents have been observed (Biritwum et al., 2017). The importance of socio-economic status and challenges in surveying urban dynamic areas, where people are constantly moving, pose additional difficulties in the implementation of urban MDAs compared to rural areas (Biritwum et al., 2017).

2.3 Onchocerciasis

Onchocerciasis, commonly known as river blindness, is a parasitic infection caused by the filarial nematode Onchocerca volvulus, which is transmitted through the bites of black flies of the genus Similium that breed in rivers and streams. The disease predominantly affects sub-

Saharan Africa, with over 99% of cases found in the region, while small foci are also present in the Americas and Yemen (Lakwo et al., 2020). The Global Burden of Disease Study estimates that the disease contributed to 1.23 million disability-adjusted life years in 2019, although this figure is likely an underestimate due to potential excess mortality caused by onchocerciasis (Tirados et al., 2022).

The primary clinical manifestation of Onchocerca volvulus infection is itching of the skin, which can develop into a chronic papular dermatitis and eventually lead to severe visual impairment or blindness (Brattig et al., 2021). The disease is a major cause of chronic skin and eye lesions, as well as systemic features such as fever and Nodding syndrome (Puente et al., 2018). The socioeconomic impact of onchocerciasis is significant, reducing income-generating capacity and incurring substantial health expenditures (Basáñez et al., 2008).

Treatment for onchocerciasis involves the use of ivermectin, which causes a rapid and long-lasting decrease in microfilariae in the skin lymphatics, reducing the pathogenic repercussions of the infection (Basáñez et al., 2008). Preventive chemotherapy and transmission control (PCT) are implemented through community-directed treatment with ivermectin (CDTi), a strategy pioneered by the African Programme for Onchocerciasis Control (APOC) (Tirados et al., 2022). The World Health Organization has set a goal to verify the elimination of transmission in at least 10 countries by 2030, which is feasible in low-moderate endemic areas through long-term mass drug administration (MDA) at high coverage (NTD Modelling Consortium Onchocerciasis Group, 2019). However, in highly endemic areas, there is uncertainty about the success of MDA, and these areas may benefit from biannual or quarterly MDA and vector control implementation (NTD Modelling Consortium Onchocerciasis Group, 2019).

Onchocerciasis control and elimination efforts rely on MDA using ivermectin and sporadic vector control, with the potential for transmission interruption after 15 years of annual treatment with at least 80% coverage (Anagbogu et al., 2022). Eliminating onchocerciasis is a priority for public health. The burden of the disease is significant, with more than 1.2 million DALYs attributed to it. The disease affects people's ability to work and earn an income, causing substantial health expenditures and having a devastating socioeconomic effect. However, with the implementation of mass drug administration with ivermectin, elimination of transmission is feasible in low-moderate endemic areas, and interrupting transmission is possible with long-term treatment. It is important to continue implementing MDA and vector control to eliminate the disease and alleviate its burden (Basáñez et al., 2008; Tirados et al., 2022).

2.4 Urban Onchocerciasis

Urban onchocerciasis presents unique challenges for control and elimination efforts due to the complex social dynamics found in urban environments. The traditional kinship and clan systems, which are crucial to the success and sustainability of APOC, are less effective in semi-urban communities (Katabarwa et al., 2000). more complex lifestyles and time demands on urban families make it challenging to bring together enough community members to make the meaningful decisions needed to implement CDTI (Katabarwa et al., 2000).

2.5 Community Drug Distributors

Mass drug administration (MDA) plays a crucial role in controlling neglected tropical diseases (NTDs), but low and/or inequitable MDA coverage can hinder the effectiveness of these programs and the achievement of the 2030 NTD targets (Agboraw et al., 2021). Community drug distributors (CDDs) are considered the primary care providers at the community level, and their

performance is impacted by various health system and program-related factors, such as inadequate training and supervision by health facility staff (Agboraw et al., 2021).

The MDA Preferred Practices Guideline, developed by RTI International in collaboration with the US Agency for International Development (USAID), has identified the following roles for CDDs in health campaigns:

- *Training*: training sessions to acquire the necessary knowledge and skills for effectively implementing MDA programs
- *Mobilization/Sensitization*: community mobilization and sensitization efforts, raising awareness about the MDA program and the diseases
- *Collecting the Drugs*: collection of the necessary drugs and other supplies to ensure adequate stock
- *Distributing the Drugs*: administration of the drugs to eligible community members
- *Preparing Report*: preparation of comprehensive report detailing activities
- *Supervising or Being Supervised*: CDDs are either responsible for supervising other CDDs or being supervised by higher-level health workers

CDDs significantly reduce costs associated with NTD control and elimination, but it is essential to consider the opportunity costs incurred by them (Amazigo et al., 2021). CDDs incur both direct and opportunity costs for participating in MDA programs, with opportunity costs being the time that could otherwise be spent on paid work or unpaid activities (Agboraw et al., 2021). Increasing community awareness and education on MDA benefits and side effects can be time-consuming for CDDs, and low awareness may increase their workload and opportunity costs (Agboraw et al., 2021). Gender norms, competing domestic priorities, and reduced literacy

levels compared to male counterparts may result in fewer females acting as CDDs in some communities (Agboraw et al., 2021). Challenges faced by CDDs, such as increasing complexity, changing circumstances regarding medicine delivery, and drug-fatigued communities, can increase CDD workloads and negatively affect their performance and motivation (Kevin et al., 2023).

Community-member participation in CDD selection positively predicts adherence to treatment yet organizing MDAs during peak farming seasons may contribute to CDD attrition (Duamor et al., 2017). Training and motivation of CDDs are critical for MDA compliance, as these individuals directly interact with target populations and can influence compliance decisions (Krentel et al., 2013). CDDs were found to be motivated by a desire to eradicate NTDs from their communities (Njomo et al., 2012). Individual and community-level factors, a sense of responsibility, and feelings of self-efficacy were also identified as main motivators for community health workers (CHWs) (Singh et al., 2015). However, factors such as short training durations, inadequate supervision, and delays in drug supplies negatively impacted their motivation and the quality of the services they provided (Njomo et al., 2012; Singh et al., 2015).

Some studies have classified incentives for CDDs to be personal, financial, and non-financial (Oluwole et al., 2019). However, there is conflicting information regarding the impact of incentives on motivation (Singh et al., 2015). Sustained or increased incentive use over time could adversely affect the performance of community drug distribution programs by diminishing the social value orientation of volunteers, leading to decreased volunteer retention and motivation to participate (Downs et al., 2014). The use of incentives or low remuneration could

also lead to an environment where intrinsic motivation is lost, and focus shifts to incentives, resulting in discontent (Singh et al., 2015).

Various factors were found to affect the motivation and retention of CDDs, including community selection processes, involvement in other health programs, incentives, other employment demands, distances involved in house-to-house distribution, and marital duties (Oluwole et al., 2019). Some CDDs have expressed that engaging in MDA without remuneration is demotivating, especially when they had to leave their primary occupations to engage in programmatic activities (Oluwole et al., 2019). Some have even argued that participating in health programs that offer competitive financial compensation, like polio campaigns, is more appealing (Oluwole et al., 2019).

Furthermore, improved supervision was desired by CDDs to enhance their ability to handle side effects (Oluwole et al., 2019). CHWs might also become demotivated if they lack community acceptance or appreciation (Singh et al., 2015). Moral support through recognition was found to increase CDD motivation and could be associated with better compliance (Njomo et al., 2012). Integration of CHWs and CDDs into larger health infrastructure was suggested to offer the necessary capacity and resources for detecting and treating remaining neglected tropical disease (NTD) cases, especially as post-elimination stages are reached (Rowan et al., 2022).

Challenges faced by CDDs, such as increasing complexity, changing circumstances regarding medicine delivery, and drug-fatigued communities, can increase CDD workloads and negatively affect their performance and motivation (Kevin et al., 2023). The role of CDDs in MDA programs is critical, and addressing issues related to training, motivation, gender

representation, and opportunity costs is essential for improving program effectiveness and achieving the 2030 NTD targets.

Chapter 3: Methodology

3.1 Introduction

This section outlines the methodology employed to address the research questions of this study, which aimed to investigate the differences in opportunity costs (net cost) faced by CDDs for preventive chemotherapy of onchocerciasis and lymphatic filariasis between urban and rural districts in Côte d'Ivoire, as well as the relationship between the duration of volunteer service as a CDD (retention) and the net cost to participate. To achieve these objectives, we provide a comprehensive description of the research design, population and sample, and the data analysis procedures utilized in this study.

By comparing the costs and identifying relationships with retention, this study aims to provide evidence-based recommendations to policymakers and program implementers to enhance the effectiveness, sustainability, and inclusiveness of MDA programs for preventive chemotherapy of onchocerciasis and lymphatic filariasis in Côte d'Ivoire.

3.2 Population

The study population consists of 136 CDDs in Côte d'Ivoire, recruited from an urban district (Abidjan) and a rural district (N'Zi). These CDDs were selected based on their direct involvement in carrying out mass MDA activities during the 2017 MDA season in Cote d'Ivoire.

The choice of Abidjan as the urban district and N'Zi as the rural district helps to capture the contrasting contexts in which MDA programs are implemented, thus allowing for a comprehensive comparison of the cost differences and barriers faced by CDDs in both settings. Abidjan, as the largest city and economic capital of Côte d'Ivoire, represents a complex urban

environment characterized by higher population density, urban mobility, and governance challenges. In contrast, N'Zi represents a typical rural setting with a smaller population and distinct geographical, social, and economic characteristics.

Participants were recruited by research teams in Côte d'Ivoire's National Program for the Control of Neglected Tropical Diseases with Preventive Chemotherapy. This collaboration facilitated the identification of CDDs who could provide valuable insights into the differences in costs and barriers to participation between urban and rural districts. Partnership with PNLMTN-CP leverages local expertise and knowledge, enhancing credibility and relevance of findings.

3.3 Research Design

This study used a cross-sectional research design, collecting data from CDDs who participated in the 2017 season MDAs for onchocerciasis and lymphatic filariasis in Côte d'Ivoire, via a questionnaire that has been added to this study's appendix section. The study compares the costs of participation, both financial and time, between CDDs in the urban district of Abidjan and those in the rural district of N'Zi. Furthermore, it analyzes the relationship between years spent volunteering and cost of participation.

3.4 Procedures

Distribution of Time as a CDD

Two-sample t-tests will be conducted to compare the means of the following numerical variables between urban and rural districts: hours spent on training, mobilization, census, collection, distribution, reporting, supervising, and combined total hours. These variables represent the total amount of time spent on tasks related to the NTD program activities during the

2017 distribution period. Time was recorded in days and hours. For this study, hours will be used to conduct all calculations.

Out-of-pocket Expenditures and Monetary Incentives

Two-sample t-tests will be conducted to compare the means out-of-pocket expenditures and monetary incentives between urban and rural districts. 'Out-of-pocket expenditures' represents the amount spent by CDDs of their own money on project activities during their participation in the MDA program. 'Monetary incentives' represents the amount of financial compensation CDDs received for their work on the NTD program in their area. For both variables, CDDs were asked to estimate the amount of money spent or received.

Weighted Average Hourly Rate

To convert the self-reported categorical income data into an hourly wage, the midpoint of each income range will be calculated by taking the average of the minimum and maximum values of the range. This midpoint will then be divided by the total number of working hours per month, which is assumed to be 160 hours (based on a 40-hour work week). For income level 1 (less than 60,000 CFA/month), half of the maximum value (60,000 / 2) will be used as the midpoint, which will be divided by 160 to determine the hourly wage. For income levels 2 and 3 (between 60,000 - 150,000 CFA/month and 150,000 - 500,000 CFA/month, respectively), the average of the minimum and maximum values of each range will be calculated and divided by 160 to determine the hourly wage. For income level 4 (more than 500,000 CFA/month), the minimum value (500,000) will be used as the midpoint, which will be divided by 160 to calculate the hourly wage. Once the hourly wage for each income category has been determined, a

weighted average will be calculated separately for urban and rural CDDs, considering the distribution of incomes across different categories.

Opportunity Cost Using Self-Reported Income

To calculate the monetary value of time spent by CDDs, the total hours spent on programmatic activities by will be multiplied by the weighted hourly that was derived in the previous step. To adjust for monetary incentives and out-of-pocket expenditures, the total monetary incentives received will be subtracted and the out-of-pocket expenditures will be added. This will result in the net cost for each CDD, providing a more accurate estimate of the economic cost of participating in the program. To compare the net costs between urban and rural CDDs, a Welch Two Sample t-test will be performed using the self-reported income data. This test will allow us to determine if there is a statistically significant difference in the net costs between the two groups of CDDs when using self-reported income data.

Opportunity Cost using Minimum Wage

To calculate the monetary value of time spent for each CDD, the minimum wage of 60,000 CFA franc per month will be used. The monetary value of time spent for each CDD will be calculated by dividing the minimum wage by the total number of working hours per month (160 hours) to obtain an hourly minimum wage. The total hours spent on programmatic activities will then be multiplied by the hourly minimum wage for each CDD. To adjust the monetary value using the minimum wage, the total monetary incentive received will be subtracted and the out-of-pocket expenditures will be added, similar to previous steps. This will result in the net cost for each CDD using the minimum wage data. Another Welch Two Sample t-test will be

performed to compare the net costs between urban and rural CDDs using the minimum wage data. This test will allow us to determine if there is a statistically significant difference in the net costs between the two groups of CDDs when using the minimum wage data.

Ordinal Logistic Regression Model

The dependent variable for this model will be labeled as 'retention'. Retention represents the duration of volunteer service as a CDD. Participants were asked to select one of the following options to indicate the duration of their participation as a volunteer: less than 1 year, 1-3 years, or more than 3 years. Given that the length of time volunteering is an ordinal variable, an ordinal logistic regression model is a suitable statistical tool for analyzing the relationship between the dependent variable and independent variables.

In the process of selecting independent variables for the analysis, several variables such as time, allowances, and expenditures were initially considered. However, these variables were used in calculating the net cost incurred by CDDs. Including those variables would have led to issues of collinearity, making it difficult to interpret the individual effects of these variables on the dependent variable. Therefore, net cost incurred by CDDs was selected as the only independent variable. Other relevant variables such as the number of 'houses covered' and 'transport money' were available in the dataset. However, these variables had several missing observations, highly skewed responses, or very similar responses, which made them less informative for the analysis. Therefore, including these variables in the model would not have provided much additional insight

The independent variable, net cost to participate, as calculated for previous steps is the product of the total hours spent on programmatic activities and the hourly wage, minus monetary incentives received, and adding the out-of-pocket expenditures. The hourly wage used for the model is the weighted average hourly wage for urban and rural CDDs based on self-reported income categories.

By employing these analytical procedures, the study aims to provide a comprehensive understanding of the differences in the cost to participate as a CDD for preventive chemotherapy of onchocerciasis and lymphatic filariasis between urban and rural districts in Côte d'Ivoire, and its potential implications on retention. The findings will contribute to the broader understanding of the challenges faced by CDDs in different settings and inform policy and programmatic decisions to improve the effectiveness of MDA programs.

3.5 Ethical Considerations

The study's methodology was examined and authorized by the Research Ethics Board of the Bruyère Research Institute (#M16-18-012). The protocol underwent review and approval by the National Committee for Life and Health Sciences Ethics (086-18/SHP/CNESVS-km) at the Ministry of Health and Public Hygiene in Côte d'Ivoire.

3.6 Limitations

Cross-sectional data: The study relies on cross-sectional data collected during the 2018 MDA campaign in Côte d'Ivoire. Consequently, it does not account for possible changes in cost structures or program dynamics over time. Longitudinal data could have provided a more comprehensive understanding of the cost differences and their impact on program delivery.

Generalizability: The study focuses on two districts, Abidjan (urban) and N'Zi (rural), which may limit the generalizability of the findings to other districts or countries. Different districts may have unique contextual factors that can influence the cost of participating in MDA programs, and these factors may not be fully captured by the study.

Self-reported data: The cost information in the study is based on self-reported expenditures and allowances, which might be subject to recall bias or social desirability bias. Although efforts were made to ensure the accuracy of the data, these biases could affect the validity of the results.

Outlier handling: The study used the IQR methodology to identify and replace outliers in the dataset. While this approach helps to minimize the influence of extreme values on the analysis, it may also introduce some degree of error if the replaced values are not accurate representations of the actual costs incurred by the CDDs.

Chapter 4: Results

In this study, the differences between urban (Abidjan) and rural (N'Zi) community drug distributors (CDDs) were examined in terms of the time spent on various tasks, monetary incentives, out-of-pocket expenditures, and net cost to participate. Furthermore, a ordinal logistic regression model was performed to identify relationships between length years volunteering and net cost to participate.

4.1 Demographics

Table 1 presents the demographic characteristics of community drug distributors (CDDs) in the urban district of Abidjan and the rural district of N'Zi. A comparison of the demographic profiles reveals several differences between the two groups.

In both districts, the majority of CDDs were male, with a slightly higher percentage of males in the rural district (73%) compared to the urban district (68%). The urban district had a higher proportion of younger CDDs, with 42% aged between 18-25 years and 41% aged between 26-35 years. In contrast, the rural district had a larger percentage of older CDDs, with 38% aged between 36-45 years and 23% aged between 46-55 years.

A significantly higher proportion of CDDs in the urban district had tertiary education (41%), while the majority of rural CDDs had completed primary school (30%) or the first cycle of secondary school (45%). This finding is consistent with the results of the Mann-Whitney U tests, which indicated higher education levels among urban CDDs. Occupational distribution also varied between the two districts. In the urban district, the most common occupation was student (38%), followed by small scale enterprise (14%) and other (14%). In the rural district, the

majority of CDDs were engaged in agricultural activities (63%), followed by small scale enterprise (18%).

Variable	Abidjan (urban)		N'Zi (rural)	
	n	%	n	%
Gender				
Male	52	68%	44	73%
Female	24	32%	16	27%
Age				
18-25	32	42%	5	8%
26-35	31	41%	17	28%
36-45	10	13%	23	38%
46-55	3	4%	14	23%
over 56	0	0%	1	2%
Education				
No education	1	1%	0	0%
Primary School	4	5%	18	30%
Secondary School: 1st cycle	11	14%	27	45%
Secondary School: 2nd cycle	24	32%	11	18%
Tertiary Education	31	41%	3	5%
Occupation				
Homemaker / Housewife	1	1%	0	0%
Agricultural Activities	3	4%	38	63%
Day worker	3	4%	2	3%
Small scale enterprise	11	14%	11	18%
Student	29	38%	3	5%
Private employment	5	7%	1	2%
Civil servant	3	4%	0	0%
No work	9	12%	3	5%
Retired	1	1%	0	0%
Other	11	14%	2	3%

Table 1: Demographic characteristics of CDDs, Cote d'Ivoire (2017)

4.2 Distribution of Time Spent as a Community Drug Distributor

Table 2 presents the distribution of time spent (mean time) as a community drug distributor (CDD) in the urban district of Abidjan and the rural district of N'Zi, and the statistical significance of differences in time spent between both districts (two-sample t-test).

There were significant differences in the hours spent on collection (p-value = 0.010) and supervision (p-value < 0.000). Urban CDDs spent more hours on collection (11.51 hours) than

rural CDDs (5.08 hours) and more hours on supervising (11.53 hours) compared to rural CDDs (2.4 hours). The combined total hours spent on MDA program activities were also significantly different between urban (126.61 hours) and rural (103.32 hours) CDDs (p-value < 0.000). There were no significant differences in the hours spent on training, mobilization, census, distribution, and reporting between urban and rural CDDs.

Variable	Urban District Mean (Abidjan)	Rural District Mean (N'Zi)	p-value
Total Hours Training	3.95	4.97	0.176
Total Hours Mobilization	28.7	24.82	0.174
Total Hours Census	24.3	22.7	0.614
Total Hours Collection	11.51	5.08	**0.01**
Total Hours Distribution	39.63	38.57	0.465
Total Hours Reporting	6.99	4.78	0.108
Total Hours Supervising	11.53	2.4	**<0.001**
Combined Total Hours	126.61	103.32	**<0.001**

Table 2: Comparison of CDDs distribution of time, Cote d'Ivoire (2017)

4.3 Out-of-pocket Expenditures and Monetary Incentives

Table 3 presents direct out-of-pocket expenditures (mean spent in CFA Franc) and monetary incentives for CDDs (mean received in CFA Franc), and p-values to determine statistical significance of any observed differences between districts.

There were no significant differences in direct out-of-pocket expenditures between urban and rural CDDs. Urban CDDs reported an average direct out-of-pocket expenditure of 2,421.05 CFA Franc (or 4.35 USD) on programmatic activities, while rural CDDs reported an average direct out-of-pocket expenditure of 2,161.67 CFA Franc (or 3.89 USD) (p-value: 0.55).

There were no significant differences in the monetary incentive received between urban and rural CDDs. Urban CDDs received an average monetary incentive of 6,302.63 CFA Franc (or 11.34 USD), while rural CDDs received an average monetary incentive of 5,178.33 CFA Franc (or 9.31 USD) (p-value = 0.09).

Variable	Urban district (Abidjan), mean	Rural district (N'Zi), mean	p-value
Out-of-pocket expenditures (CFA Franc)	2421.05 (USD 4.35)	2161.67 (USD 3.89)	0.55
Monetary incentives (CFA Franc)	6302.63 (USD 11.34)	5178.33 (USD 9.31)	0.09

Table 3: Comparison of CDDs out-of-pocket expenditures and monetary incentives, Cote d'Ivoire (2017)

4.4 CDDs Opportunity Cost

Urban and Rural Average Hourly Wage Rates

The urban weighted average hourly wage was calculated to be 742.60 CFA (or 1.33 USD), while the rural weighted average hourly wage was 406.25 CFA (or 0.73 USD. These values were derived by converting the categorical income levels provided by the CDDs into the midpoint of each income range and then calculating the average hourly wage for each group.

Additionally, the hourly minimum wage rate was calculated to be 375.00 CFA (or 0.68 USD). This value was derived by dividing the 2017 minimum wage of 60,000 CFA by 160 hours (assuming 40-hour work week).

Opportunity Cost Using Self-Reported Income

A Welch Two Sample t-test was performed to compare the opportunity cost (net cost to participate) between urban and rural CDDs using self-reported income. The results indicate that there is a statistically significant difference between the net costs of participating in

programmatic activities for urban and rural CDDs using self-reported income data. Urban CDDs mean net costs were estimated to be 90,135.32 CFA (or 162.40 USD), while rural CDDs mean net costs were estimated to be 38,955.73 CFA (or 70.19 USD) (p-value < 0.001).

Opportunity Cost Using Minimum Wage

A Welch Two Sample t-test was performed to compare the net costs between urban and rural CDDs using the minimum wage data. The results indicate that there is a statistically significant difference between the net costs of participating in programmatic activities for urban and rural CDDs using the minimum wage data. Urban CDDs mean net costs were estimated to be 43,595.39 CFA (or 78.55 USD), while rural CDDs mean net costs were estimated to be 35,727.08 CFA (or 63.37 USD) (p-value = 0.002).

Method	Urban Mean Net Cost	Rural Mean Net Cost	t-statistic	Degrees of Freedom	p-value
Self-reported Income	90,135.32 CFA	38,955.73 CFA	12.635	112.39	< 0.001
Minimum Wage	43,595.39 CFA	35,727.08 CFA	3.0531	133.3	0.002

Table 4: Comparison of opportunity cost of being a CDD between urban and rural districts, using two methods

4.5 Ordinal Logistic Regression Model

An ordinal logistic regression model was fitted to examine the relationship between the duration of volunteer service and the net cost to participate. The model was fitted using the logit link function with flexible thresholds, and the analysis included 136 observations.

The results of the model show that the net cost to participate has a significant negative relationship with the duration of volunteer service (Estimate = -2.64e-05, Std. Error = 5.21e-06,

z-value = -5.066, p-value < 0.001). This indicates that as the net cost to participate increases, the odds of CDDs staying in the program for a longer duration decrease.

The threshold coefficients, which represent the boundaries between the different levels of the dependent variable (duration of volunteer service), are as follows:

- For the boundary between "less than 1 year" and "1 to 3 years" (1|2): Estimate = -3.1838, Std. Error = 0.4705, z-value = -6.767
- For the boundary between "1 to 3 years" and "more than 3 years" (2|3): Estimate = -0.9768, Std. Error = 0.3716, z-value = -2.629

Chapter 5: Discussion

This study aimed to explore into the differences in opportunity costs faced by community drug distributors (CDDs) in urban and rural districts of Côte d'Ivoire and examine the relationship between the duration of volunteer service and net cost incurred by CDDs. An in-depth analysis of the data was conducted, considering various factors, including demographics, education, occupation, hours spent on MDA activities, direct out-of-pocket expenditures, monetary incentives received, and hourly wage rates.

The demographic differences between urban and rural CDDs could have implications for the opportunity costs they face. For instance, the higher proportion of younger CDDs and those with tertiary education in the urban district might suggest that they have different opportunity costs compared to their rural counterparts, given the potential for higher-paying jobs in urban settings. On the other hand, older CDDs with lower educational attainment in rural areas might face more limited job opportunities, resulting in lower opportunity costs. This could partly explain the observed differences in opportunity costs between the two groups.

The variation in occupation distribution between urban and rural CDDs further highlights the potential differences in opportunity costs. Urban CDDs, with a higher proportion of students, might face more significant opportunity costs related to their education and career prospects. In contrast, rural CDDs, who are mainly involved in agricultural activities, may experience opportunity costs related to their agricultural work, which can be highly seasonal and dependent on various external factors, such as weather and market conditions.

Significant differences in hours spent on collection and supervision activities between urban and rural CDDs could be attributed to the unique challenges faced by CDDs in these different settings. For example, urban CDDs might need to spend more time on these activities

due to the larger and more densely populated areas they serve. The higher total hours spent on MDA program activities by urban CDDs could also contribute to the observed differences in opportunity costs, as they might have to forego more income-generating opportunities to participate in MDA programs.

Despite the lack of significant differences in direct out-of-pocket expenditures and monetary incentives received by CDDs, these factors could still influence the overall opportunity costs experienced by CDDs. For example, if the monetary incentives provided to CDDs do not adequately compensate for the income they forego while participating in MDA programs, they might perceive the net costs as too high, potentially impacting their retention in the program.

The significant differences in opportunity costs between urban and rural CDDs, calculated using both self-reported income data and minimum wage data, highlight the importance of considering these costs when designing and implementing MDA programs. By understanding the specific challenges faced by CDDs in different settings, targeted strategies can be developed to address these issues and ensure the success of MDA programs.

The negative relationship between the duration of volunteer service and net cost, as revealed by the ordinal logistic regression analysis, indicates that CDDs who face higher opportunity costs are less likely to remain in the program for a longer duration. This finding underscores the importance of addressing opportunity costs in MDA program design and implementation, as reducing the net costs to participate could potentially lead to increased retention of CDDs, ultimately contributing to the overall success of the programs.

5.1 Implications

This study found significant differences in age, education level, and income level between urban and rural CDDs. Future research could explore the impact of these demographic

factors on CDD retention, workload, and coverage rates, which could inform targeted recruitment, training, and support strategies. Given the differences in cost and demographic factors between urban and rural CDDs, it is essential to design and implement context-specific strategies to address the unique challenges faced by CDDs in different settings, ultimately improving the overall effectiveness and sustainability of MDA programs.

All in all, this thesis provides valuable insights into the differences in the cost to participate as a community drug distributor for preventive chemotherapy of onchocerciasis and lymphatic filariasis between urban and rural districts in Côte d'Ivoire, and the relationship between retention and cost to participate. The findings highlight the importance of understanding the unique challenges faced by CDDs in different settings and the need for tailored strategies to support and retain these crucial volunteers in MDA programs. By addressing these issues and implementing targeted interventions, public health practitioners and policymakers can enhance the effectiveness and sustainability of MDA programs for lymphatic filariasis and onchocerciasis control, ultimately contributing to the global efforts towards the elimination of neglected tropical diseases.

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Appendix

Questionnaire for NTD volunteers
Identification
IDENTIFICATION NUMBER:
INTERVIEW DATE:
INTERVIEWER NAME:
START TIME OF INTERVIEW: _____

SOCIOECONOMIC QUESTIONS

1. Geographic identifiers:
a. Country: Uganda Ivory Coast
b. District: _____
c. Sub-district:_____
d. Village:_____

2. Gender (select one): male female

3. What is your age (years):

a. 18-25
b. 26-30
c. 31-25
d. 36-40
e. 41-45
f. 46-50
g. 51-55
h. 56-60
i. 60-65
j. 66+

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. Tertiary college / technical college
f. University

g. Other:____

5. Where does the primary source of income for your family come from? [Do not read answers; only one answer is possible]

a. Agricultural activities (eg. Farming, fishing)
b. Day worker (eg. Factory, construction)
c. Small scale enterprise (eg. Kiosk owner, market stall etc)
d. Private employment (eg. bank, business etc)
e. Student
f. Civil servant / government official
g. Income from pension (retired)
h. Other: _____

6. What is your primary occupation? [Do not read answers; only one answer is possible]
a. Homemaker / housewife
b. Agricultural activities (e.g. farming, fishing)
c. Day worker (e.g. factory, construction)
d. Small scale enterprise (e.g. kiosk owner, market stall etc)
e. Student
f. Private employment (e.g. bank, business etc)
g. Civil servant / government official
h. No work
i. Pension/ retired
j. Other:_____

7. Income level from work: [Read all answers, only one answer is possible]
a. Less than 60,000 CFA per month
b. Between 60,000-150,000 CFA per month
c. Between 150,000-500,000 CFA per month
d. More than 500,000 CFA per month
e. I don't know

8. What is your role in your community? [Do not read answers; Check all that apply]
a. Village leader
b. Religious / spiritual leader
c. Health volunteer
d. Member of a community group (e.g. cooperative, savings group, women's group, farming group)
e. Teacher
f. Other:_____

NTD PROGRAMME VOLUNTEERISM

Let's talk now only about your involvement with the NTD program (LF, oncho, schisto, trachoma, STH) in your community.

9. Do you currently volunteer for the NTD program in your community?
a. Yes
b. No

10. How long have you been a volunteer for the NTD program?
a. < 1 year
b. 1-3 years
c. More than 3 years

11. How were you chosen? [Do not read answers; Check all that apply]
a. The community leaders chose me
b. Community members chose me
c. The health worker in my area chose me
d. Friend / family member chose me
e. I applied for the position or I volunteered
f. I was already a health volunteer for another program
g. Other:_____

12. Which NTD activities are carried out in your community? [Do not read answers; Check all that apply]
a. Trachoma education and prevention
b. Trachoma surgery
c. Sensitization
d. Water, sanitation and hygiene (WASH) education
e. Drug distribution for soil transmitted helminths
f. Drug distribution for lymphatic filariasis
g. Drug distribution for onchocerciasis
h. Drug distribution for schistosomiasis

13. In general, what are your tasks for the NTD program? [Do not read answers; Check all that apply]
a. Conduct census data
b. Promotion and education activities in my community
c. Measuring people before giving treatment
d. Distribute drugs
e. Follow a training / refreshing activity
f. Mop-up
g. Reporting
h. Other:_____

14. How many households are you responsible for covering in your NTD activities:
_____

15. How often do you measure people's height before you give the treatment? [Read all answers; only one answer is possible]
a. Always
b. Sometimes
c. Never

16. How often do people swallow the drugs in front of you? [Read all answers; only one answer is possible]
a. Always
b. Sometimes
c. Never

17. Have you ever been supervised during your participation in these activities?
a. Yes
b. No □Go to No. 19

18. If yes, who supervised you? [Do not read the answers; Check all that apply]
a. Village leader
b. Community supervisor
c. Nurse / midwife
d. Doctor
e. Parish supervisor
f. District health authority staff / inspector
g. Not supervised
h. Other

19. For which of the activities from the following list did you attend a training session? [Read all answers; Check all that apply] :
a. Reports and Registration
b. Techniques for encouraging my community to participate (advice for behavior change)
c. How to promote health
d. How to distribute medication (use of measuring stick)
e. How to track side effects
f. What to do when someone refuses to participate in the health program
g. Other: _____

20. How would you describe your level of knowledge to carry out the NTD program activities? [Read all answers; only one answer possible]

1 Very Poor
2 Poor
3 Average
4 Good
5 I have more than enough knowledge

21. How are you compensated for the tasks you do for the NTD program in your area? [Do not read answers; Check all that apply]

a. Financial payment, if so, what is the amount? _____
b. Transport money
c. Bike
d. Motorbike
e. T-shirt
f. Badge
g. Cap
h. Travel bag
i. Bag
j. Meal, Drink
k. Certificate
l. Recognition of my work in my community
m. Training
n. Refresher course
o. Educational Materials
p. Measuring stick
q. Other: _____

RELATIONSHIP WITH THE NTD VOLUNTEER AND THE COMMUNITY

22. How would you describe the community's attitudes in general to NTD programme activities? [Read all answers; only one answer possible]

1 Do not want to cooperate at all
2 Cooperate only a little
3 Neutral
4 Quite Cooperative
5 Very Cooperative

23. Is this the same for all of the NTD program activities?

a. Yes
b. No
c. I don't know

24. Which program is the most challenging for you to engage the community in? [Read all answers / only one answer is possible]
a. Trachoma education and prevention
b. Trachoma surgery
c. Sensitization
d. Water, sanitation and hygiene (WASH) education
e. Drug distribution for soil transmitted helminths
f. Drug distribution for lymphatic filariasis
g. Drug distribution for onchocerciasis
h. Drug distribution for schistosomiasis
i. All are the same

25. Which program is the easiest for you to engage the community in? [Read all answers / only one answer is possible]
a. Trachoma education and prevention
b. Trachoma surgery
c. Sensitization
d. Water, sanitation and hygiene (WASH) education
e. Drug distribution for soil transmitted helminths
f. Drug distribution for lymphatic filariasis
g. Drug distribution for onchocerciasis
h. Drug distribution for schistosomiasis
i. All are the same

26. What kinds of tools / job aids were you given to assist you with engaging the community? [Do not read answers; Check all that apply]
a. I did not receive any job aids / tools
b. Brochures to distribute
c. Educational sheets or flipcharts to help me with education and promotion
d. Posters to hang in my community
e. Guidebook for health volunteer
f. Height measuring stick
g. Stationary (pen paper)
h. Other: ____

EXPERIENCE WORKING WITH THE NTD PROGRAMME

In this next group of questions, I would like to hear about your experience working with the NTD program.

27. In the last MDA, which activities did you participate in: [Read all responses; Check all that apply]
a. Reports and Registration
b. Encouraging my community to participate (advice for behavior change)
c. Promote health
d. Measure community members (using measuring stick)
e. Distribute medication
f. Track / follow up side effects
g. Other: _____

28. Can you think about the last time you carried out your activities for the NTD program. Would you tell me about one experience you remember most from the last NTD campaign?

The following questions (#29-37) are related to the story from #28.

29. When did your story occur: [Read all answers / only one answer is possible]

a. Within the last 6 months
b. Within the last year
c. More than a year ago

30. What statement below best describes what happened in your story? [Read all answers / only one answer is possible]
a. Something that happened to me
b. Something that I heard about
c. Something that I saw

31. Where did your story occur?
a. In the health facility
b. In the community
c. At the school
d. Other:____

32. How did you feel at the time this story happened? [Do not read answers; only one answer is possible]

a. Happy
b. Sad
c. Angry
d. No emotion
e. Other

33. Were you given anything for the activities carried out in your story?
a. Yes
b. No Go to #36

34. If so, what were you offered? [Do not read answers; Check all that apply]

a. Financial payment, if so, what is the amount? _____
b. Transport money
c. Bike
d. Motorbike
e. T-shirt
f. Badge
g. Cap
h. Travel bag
i. Bag
j. Certificate
k. Recognition of my work in my community
l. Training
m. Refresher course
n. Educational Materials
o. Other:_____

Not applicable

35. At the time of your story, what was your opinion about what you received? [Read all answers / only one answer is possible]
a. It was more than enough for the work I did
b. It was enough
c. It was not enough for the amount of work that I did
d. Other:_____
e. No opinion

36. In your story, how confident did you feel carrying out the NTD program activities? [Read all answers; only one answer possible]

1 No very self-confident
2 Not self-confident
3 Neutral self-confident
4 Quite self-confident
5 Very self-confident

37. At the time of your story, how would you evaluate the importance of the NTD program in your community? [Read all answers; only one answer possible]

1 Not important at all
2 Only a little important
3 Average importance
4 Quite important
5 Very important

PERCEPTION OF THE NTD PROGRAMME

In this section of questions, I would like us to talk about your perceptions about the NTD program.

38. During your involvement with the NTD program, have you received any of the following feedback: [Read all answers; Check all that apply]
a. Coverage rates for drug distribution for my own catchment area
b. Coverage rates for drug distribution in my village
c. Number of people who have the disease in my village
d. Change in the number of people who have the disease in my village
e. Number of people who have participated in the NTD program in my community (number of people swallowing drugs, accepting surgery, receiving WASH education)
f. No feedback
g. Other:____

39. In your opinion, how would you describe the change in NTDs in your community since you became involved with the program? [Read all answers; only one answer is possible]
a. No change at all
b. It is getting better / there is some positive change
c. It is getting worse / there is some negative change
d. I don't know

40. In your opinion, how important is your role to the success of the NTD program in your community? [Read all answers; only one answer possible]

1 Not important at all
2 Only a little important
3 Average importance

4 Quite important
5 Very important

41. What is your opinion about the drugs distributed for lymphatic filariasis/ onchocerciasis? [Read all answers; only one answer possible]

1 Very dangerous
2 Dangerous
3 Average / Neutral
4 Safe
5 Very safe

42. What are the most common problems you encounter in your work as a NTD volunteer? [Read all answers; Check all apply]

a. Not enough time to carry out my personal tasks
b. Not enough time to carry out my tasks for the NTD programme
c. Too much responsibility / tasks to do
d. Not enough supervision
e. Not enough results from the NTD campaign in my district
f. The community is not responsive to the NTD program
g. Difficult to reach the community
h. Run out of supplies (drugs, educational materials)
i. Planning is not well done
j. Other:____

COSTING QUESTIONS

We'd like to get an idea about the amount of time and money you spend working as a NTD volunteer.

43. Thinking about the last time you participated in the MDA here, did you spend any of your own money on project activities?

a. Yes
b. No [SKIP to #46]

44. If yes, can you estimate how much? _____

45. Can you describe what was bought? [Do not read answers; mark all that apply]

a. Stationary
b. Pens / pencils
c. Food

d. Transport paid out of pocket (taxi, motorcycle)
e. Fuel (if personal vehicle was used)
f. Lodging
g. Cellphone air time
h. Health center costs related to MDA
i. Other

46. Please indicate below the amount of time that you spent on NTD program activities in the last distribution period, the total number 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 than one day to complete (e.g. <8 hours), then record as 1 day.

CDD
Attending Training
Mobilization/ Sensitization
Census / Updating Register
Collecting the Drugs
Distributing the Drugs
Preparing Report
Supervising or Being Supervised
Other (describe below)
Total number of Days:
Hours Per Day :
Total Hours :

GENERAL VOLUNTEERISM

I would like to ask you about volunteering for health in this community.

47. In addition to NTDs, which of the following programs have you participated in during the last 3 years? [Do not read answers. Check all that apply]
Polio / Immunization
a.
b. Maternal and child health
c. Malaria
d. HIV/AIDS
e. Other:_____

For the following questions (#48 - 56) please keep in mind all the activities you perform as a health volunteer (NTDs and the other health programmes).

48. In your opinion, how many hours per week in total are you engaged with health tasks related to these programs? _____

49. Were you given a formal agreement (work contract, job description) for any of these programs that you volunteer for?
a. Yes, which one(s)? _____
b. No

50. In your opinion, which program offers the best remuneration for your time?
_____

51. What do they offer? [Do not read answers; Check all that apply]
a. Financial payment, if so, how much? _____
b. Transport money
c. Bike
d. Motorbike
e. T-shirt
f. Badge
g. Cap
h. Travel bag
i. Certificate
j. Recognition of my work in my community
k. Training
l. Refresher course
m. Educational Materials
n. Other: _____

52. In your opinion, which program offers the worst remuneration for your time?
_____

53. What do they offer? [Do not read answers; Check all that apply]

a. Financial payment, if so, how much? _____
b. Transport money
c. Bike
d. Motorbike
e. T-shirt
f. Badge
g. Cap
h. Travel bag
i. Certificate
j. Recognition of my work in my community
k. Training
l. Refresher course

m. Educational Materials
n. Other: _____

54. Why did you want to be a health volunteer in your community? [Read all answers; Check all that apply]
a. To help my community
b. To help my family
c. To earn extra income
d. To learn more about health
e. To have better job prospects
f. I didn't have a choice, I was told I had to participate
g. Other:_____

55. Of the responses given, which is the most important reason you accepted to be a health volunteer in your community? [Do not read answers; only one answer is possible]
a. To help my community
b. To help my family
c. To earn extra income
d. To learn more about health
e. To have better job prospects
f. I didn't have a choice, I was told I had to participate
g. Other:_____

56. In general, how would you rate your relationship with the community in your work as a health volunteer? [Read all answers; only one answer possible]

1 Very difficult
2 difficult
3 Average / neutral relationship
4 Easy relationship
5 Very easy relationship

MOTIVATION QUESTIONS

We want to understand what is important to you as a health volunteer. The following questions are related to what we can do to make it a successful program in your community.

57. Compared to the other health programs you volunteer for, how would you rate the time you must work for the NTD program? [Read all answers; only one answer is possible]
a. More time needed for NTD program activities
b. About the same amount of time as the other programs
c. Much less time needed for NTD program activities

d. I only work in the NTD program so cannot comment [Skip to 60]

58. Compared to the other health programs you volunteer for, how would you rate the importance of the NTD program in your community? [Read all answers; only one answer is possible]
a. The NTD program is more important than the other health programs
b. The NTD program is as important as the other health programs
c. The NTD program is not as important as the other health programs

59. Compared to the other health programs you volunteer for, how would you rate what given to you from the NTD program for your work? [Read all answers; mark a single answer]
a. I am given more remuneration with the NTD program activities
b. My remuneration for the NTD program is about the same as the other health programs
c. The remuneration for the NTD program is less than the other health programs

60. In your work as a NTD volunteer, which of the following statements is true? [Read all answers; Check all that apply]
a. I work alone most of the time
b. The other NTD volunteers in my community support me
c. The leaders in my community support me
d. The health staff working in my community support me

61. In terms of the NTD program, using 1-5 rank the following in terms of their importance to you as a volunteer (1 is most important and 5 is least important):
_____Financial payment for my time
_____Formal recognition within my community for my volunteer work
_____Formal agreement outlining my work as a NTD volunteer
_____Receipt of some material incentives (badge, t-shirts, bicycles, hats)
_____Improved knowledge about health

62. For the following rank these statements in order of their importance using 1 – 5 (1 being the most important to you and 5 being the least important for you):
_____Being a NTD volunteer helps my family / household
_____Being a NTD volunteer makes me feel good
_____Being a NTD volunteer is important for my community
_____Being a NTD volunteer helps my country
_____Being a NTD volunteer gives me better opportunities

63. Will you participate in the next round of activities with the NTD program?
a. Yes
b. No
c. Maybe

64. Why?

Thank you for your participation and for your ongoing work as a NTD volunteer in your community!

END TIME OF INTERVIEW: _____
RESULT OF INTERVIEW :
COMPLETE : _____
INCOMPLETE: _____ REASON : _____
INTERVIEW NOTES :