

Using Community Health Workers to assess the effectiveness of the Community Health Strategy in Kibera, Langata district using two statistical models

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Declaration

I hereby declare that this dissertation submitted to the Jomo Kenyatta University of Agriculture and Technology is original work and has not been submitted in any form for the examination for a degree or diploma to any other university.

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ABSTRACT

About 70% of child deaths in the community occur at home caused by preventable or easily curable diseases like malaria, diarrhea and malnutrition. The government of Kenya came up with a plan referred to as Community Health Strategy in 2006 which acknowledges that communities form the foundation in the provision of affordable, equitable and effective healthcare. To implement this, the government enrolled community health workers who are trained members of the community chosen by community members or organizations to provide basic health and medical care to their community. Five years in its implementation, the targets are far from being met. In the case of Kibera, only 13 Community Units (CUs) are established. The objective of this study was to use the information from community health workers to evaluate the effectiveness of the community health strategy in Kibera, Langata district using two statistical models. A cross sectional research design was used in this study. A sample size of 92 CHWs was picked from 7 CUs. The CUs included Silanga, Laini Saba, Katekwera, Soweto East, Soweto West, Kianda, and Mashimoni. The data collected was cleaned and analyzed using R. A binomial regression was used to determine the effect of support supervision, training and incentive on satisfaction. The results from the study indicated that training and incentives were the main causes of unsatisfaction to CHWs. 62% of the CHWs were unsatisfied with training because they are not fully schooled on how to address most of the health issues facing their communities. 66% of the CHWs were unsatisfied due to lack of incentives. The study noted that the most important incentives were CHW tool kits and monthly stipend. 34% of CHWs were found to be satisfied with incentives. This was also attributed to provision of tool kits (apart from cash) and the fact that most of them were self employed while others were in the informal labor market (such as Masonry, painting, tailoring and simple *fundis*) thus able to support

themselves and their kin. 55% of the CHWs were found to be satisfied with supervisory support that they received. The results also showed that there were minimal differences in the logit and probit model. The probit model had more accurate and precise estimates. This study recommends an extension of the implementation of the Community Health Strategy period, a review on the incentives and training curriculum of the CHW. It also recommends provision of tool kits and reporting tools to CHWs as well as simplification of the reporting tools to make them user-friendly. This study did not delve into the quality of the work done by CHWs, an area that could give more information if researched on.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
AMREF	African Medical and Research Foundation
APHIA	AIDS, Population and Health Integrated Assistance
ART	Anti-Retroviral Therapy
ARV	Anti-Retroviral Drug
CBHC	Community Based Health Care
CBS	Central Bureau of Statistics
CHC	Community Health Committee
CHEW	Community Health Extension Worker
CHS	Community Health Strategy
CHW	Community Health Worker
CU	Community Units
FGD	Focus group Discussions
GIS	Geographic Information System
GOK	Government of Kenya
HIV	Human Immunodeficiency Virus
HSR	Health Sector Reform
IMR	Infant Mortality Rate
ITNs	Insect Treated Nets
KDHS	Kenya Demographic and Health Survey
KEPH	Kenya Essential Package for Health
KHPF	Kenya Health Policy Framework
KWAHO	Kenya Water For Health Organization
MNCH	Maternal Newborn and Child Health
MOH	Ministry of Health
NGO	Non-Governmental Organization
NHSSP	National Health Sector Strategic Plan
PHC	Primary Health Care

PHASE	Personal Hygiene and Sanitation Education
PMTCT	Prevention of Mother to Child Transmission
TB	Tuberculosis
VHC	Village Health Committee

DEFINITION OF TERMS

Antiretroviral	Medications for the treatment of infection by retroviruses, primarily HIV.
Community health	A discipline that involves the study and betterment of the health characteristics of biological communities.
Community health Worker	Trained members of a community who are chosen by community members or organizations to provide basic health and medical care to their community.
Community Units	Comprises approximately 1,000 households or 5,000 people who live in the same geographical area, sharing resources and challenges.
Infant Mortality	Ratio of infant deaths to live births.
Malnutrition	Condition that results from taking an unbalanced diet in which certain nutrients are lacking, in excess (too high an intake), or in the wrong proportions.
Maternal Mortality	Number of maternal deaths per 100,000 live births.
Poverty	The state of having little or no money and few or no material possessions.
Primary Health Care	Interventions that focus on the individual or family such as hand washing, immunization, circumcision and use of condoms etc.
Tuberculosis	Lethal, infectious disease caused by various strains of mycobacterium usually <i>Mycobacterium tuberculosis</i> .

CHAPTER ONE

INTRODUCTION

1.1 Background information

Community health is a discipline that concerns itself with the study and betterment of the health characteristics of biological communities, (Simba *et al*, 2007). It tends to focus on geographic areas rather than people with shared characteristics. The health characteristics of a community are often examined using geographic information system software (GIS) and public health datasets, (Simba *et al*, 2007). About 70% of child deaths in the communities occur at home, without any contact with the health system, (Muga *et al*, 2006). These deaths are caused by preventable or easily curable diseases such as malaria, measles, acute respiratory infections, pneumonia, diarrhea and malnutrition (Muga *et al*, 2006).

Traditional approaches to healthcare continue to be ignored at a time when the coverage by the formal facility based healthcare system has gradually declined as people's confidence in the formal health sector has eroded, (Simba *et al*, 2007). The service users turn first to non-formal and traditional sources of care, since they are readily available to households, and only come to the health facilities as a last resort. The people have learnt through experience that they should not rely only on the conventional service providers hence there is an overwhelming need to negotiate with people and households giving them a chance to influence the way care is delivered and thus restore their confidence in the health system, (Muga *et al*, 2006).

Through continued respectful dialogue, it will enlarge their choices as we seek to support them in making rational, evidence-based decisions concerning their health needs across all

stages in the human life cycle and thus reverse the trends in health indicators. Despite the government's effort to empower community health there is still a gap which is evidenced by high infant mortality rates, maternal deaths, poverty and malnutrition. Therefore it calls for a comprehensive plan and analysis on how to tackle the problem through training, supervision and motivation of the community health workers.

1.2 The Community Health Strategy

The community health strategy is a plan that acknowledges that communities form the foundation in the provision of affordable, equitable and effective healthcare, (MOH, 2007b). Initiating the Community Strategy is envisioned as a logical, step-by-step process. The community based approach, is the mechanism through which households and communities take an active role in health and health-related development issues. It aims to develop linkages into existing household/ community-based care systems in order to learn as well as influence them to ensure the adequacy and effectiveness of health actions. This can best be done through partnership, which requires recognition of community systems and a careful process of engagement to build a relationship with the community-based service providers.

Initiatives outlined in the approach target the major priority health and related problems affecting all cohorts of life at the community and household levels. Level 1 of the Kenya Essential Package for Health (KEPH) defined service delivery, (MOH, 2007b).

The goal of the community strategy is to enhance community access to healthcare in order to improve productivity and reduce poverty, hunger, child and maternal deaths, as well as improve socio-economic performance across all the stages of the life cycle.

One of the key innovations of KEPH is the recognition and introduction of level 1 service which is aimed at empowering Kenyan households and communities to take charge of improving their own health.

The strategic plan recognizes that the health facilities at levels 2 and 3 will improve the effectiveness of their service delivery if they work closely with their catchment communities through various committees in the community strategy framework that link to service delivery at the household level, (MOH, 2007a). This will provide opportunity to generate informed dialogue between the health system and the community, to create demand for quality services on the part of the community, and to enhance their responsibility for action for health at level 1. For this to happen, the committee structures must be inclusive in terms of administrative areas as well as interest groups, (MOH, 2007b).

This study focused on the community health strategy and looked at how the strategy can be best implemented and sustained through motivation, training and support supervision of community health workers. Two statistical models, binomial logit and probit were used in the analysis.

1.3 Statement of the problem

Health is attainable, accessible and sustainable by people for themselves and their communities if they are given the opportunities. Unless people are empowered to take charge of their own lives and health no sustainable achievement in improving health is possible. Effective community program of awareness, education and development of human and economic resource with the emphasis on valuing local cultural practices as sources of preventive and curative health is crucial. However, a large proportion of

Kenyans continue to die from preventable diseases and other health conditions. This is despite Kenya's well focused national health policies and a reform agenda whose overriding strategies aim to improve healthcare delivery services through efficient and effective health management systems.

The policies and reforms have not yet yielded a breakthrough in improving the situation of households entrapped in the vicious cycle of poverty and ill health. Poverty compounds powerlessness and increases ill health as ill-health increases poverty. Both have become progressively worse since the 1990s, with appalling disparity within and between provinces. The situation is further exacerbated by the widespread prevalence of HIV/AIDS, and the resurgence of communicable diseases such as TB and malaria (MOH, 2006a).

Community systems are faced with the challenge of coping with the growing demand for care, in the face of deepening poverty, and dwindling resources. Kenya's troubling health indicators include: Rising infant mortality rate from 72 per 1,000 live births in 1998, to 77 in 2003, 78 in 2005 and 81 per 1,000 live births in 2008 (KDHS, 2008); Rising under-five mortality rate from 90.9 per 1,000 live births in 1989 to 115 per 1,000 live births in 2003 (KDHS, 2008); High maternal mortality rate of 414 in 2002 per 100,000 live births (MOH, 2005), although this marked a significant improvement from the 590 per 100,000 recorded in 1998).

In addition, the 2008-2009 Kenya Demographic and Health Survey revealed that: 35% of the children below the age of 5 years were stunted; only 13.2% of children were still exclusively breastfeeding at 6 months while 56.8% were still breastfeeding by end of three months. 61.5% of under-fives had child health cards; only 59.2% of children in the second

year of life were fully immunized; only 4.3% of under-fives and 4.5% of pregnant mothers slept under ITNs; only 40.8% of deliveries were assisted by a health professional and only 39.4% occurred in health facilities. Both the Health Sector Reform (HSR) and the Primary Health Care (PHC) divisions have been advocating for better health for the people through people's own active initiative and involvement. HSR expanded community-based healthcare (CBHC) principles through decentralization of planning and service delivery (Simba *et al*, 2007). The intention was to formalize people's power to determine their own health priorities and link them to the formal health system in order to reflect their decisions and actions in health plans (Muga *et al*, 2006).

1.4 Justification

The challenge and potential difficulties that exist in developing community participation in health programs are important and are major indicators that are pointing to Kenya missing out on the health related millennium development goals. Among the concerns is that the current approaches to health service provision need major rethinking. This is shown when about half of children under five years, do not go to hospitals for major illnesses like malaria, diarrhea and pneumonia and they end up dying.

A large proportion of this could be prevented through early recognition for care, seeking appropriate and low cost treatment of sick children at home or in the community with antibiotic, anti malaria or oral rehydration. Medics contend that such children are getting services at home, which means, it is crucial to start empowering the community to render certain basic health services. Presently the health sector faces a multifaceted crisis including a unsatisfied workforce. In such a context, the community strategy, now widely

referred to as 'task-shifting', where some tasks are delegated to the lower levels can make a big difference in the access to basic health services. The people have learnt through experience that they should not rely only on the conventional service providers.

There is therefore an overwhelming need to negotiate with people and households as partners in healthcare, giving them a chance to influence the way care is delivered and thus restore their confidence in the health system. Meeting this need means focusing attention on enhancing the capacity of households to play their role in action for health effectively. Through continued respectful dialogue, the strategy should be able to enlarge their choices, thereby reversing the trends in health indicators. Turning the competing systems into collaborating partners will add value to all and benefit the households more. Therefore, the need to evaluate the community healthcare program is widely acknowledged and crucial to know whether the program is promising for desired effects or not.

1.5 Objectives

1.5.1. Overall objectives

i) Using Community Health Workers to evaluate the effectiveness of the community health strategy in Kibera, Langata district using two statistical models.

1.5.2 Specific Objective

i) To determine the effect of support supervision on CHWs' satisfaction

ii) To determine the effect of training on CHWs' satisfaction.

iii) To determine the effect of incentives on CHWs' satisfaction.

ii) To determine accuracy and precision of logit and probit model on assessing CHW satisfaction.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Background History

In 1994, the Government of Kenya (GOK) approved the Kenya Health Policy Framework (KHPF) as a plan for developing and managing health services (MOH, 1999). It spelt out the long-term strategic imperatives and the agenda for Kenya's health sector. The 2009 National Census estimated Kenya's population to be 38.6 million, of whom 56 percent were less than 20 years of age. Life expectancy was estimated at 48.9 years as of 2006, and has risen to 57.9 years as of 2010. Total fertility rate has decreased slightly, from 4.91 children born per woman (2006 estimate), to a value of 4.38 (2010 estimate).

According to the 2008 Kenya Demographic and Health Survey, more married women are using modern contraceptive methods. The prevalence rate has risen from 18 percent in 1989 to 27 percent in 1993, 32 percent in 1998, and 33 percent in 2003 (CBS, 2004). Overall morbidity and mortality remain high, particularly among women and children. An infant mortality rate (IMR) of 62 percent in 1993 increased by 12 percentage points to 74 in 1998 but was not significantly different (at 77) in 2003. The under-five mortality rate also rose from 110 deaths per 1,000 live births in the period 1993-1998 to 115 in the 1998-2003 period (CBS, 2004). Maternal mortality in 2003 was estimated to be 414 maternal deaths per 100,000 live births, which is a decline from the 590 deaths estimated for 1998, but also with large sampling errors, which makes comparing the rates over time uncertain (CBS, 2004).

The development of the first National Health Sector Strategic Plan (NHSSP-I) for the period 1999-2004 was a follow-up to the Ministry of Health's efforts to translate the policy

objectives into an implementable program (MOH, 1999). In addition to taking into account past constraints, it involved key stakeholders in the planning process from the start through consultative workshops within the Ministry itself and with other stakeholders in public and private sectors such as development partners, districts, provinces, NGOs, religious groups, professional organizations, communities, and users of health services, as well as teaching and research institutions. The end product thus incorporated the views and priorities of all these groups. The NHSSP-I was evaluated in September 2004 by an external team of independent consultants.

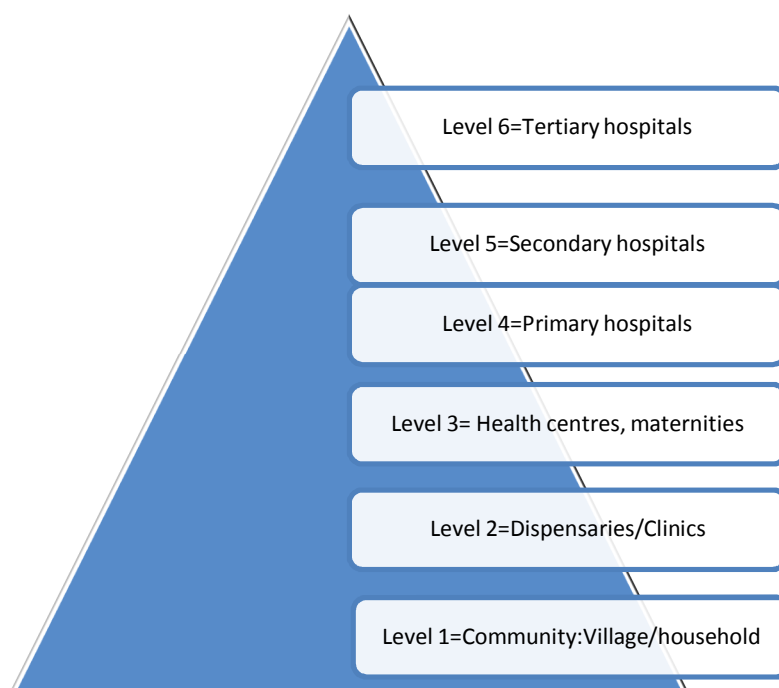
The evaluation found that despite having well focused national health policies and reform agenda whose overriding strategies were focused on improving health care delivery services and systems through efficient and effective health management systems and reform, the overall implementation of NHSSP-I (1999-2004) did not manage to make a breakthrough in terms of transforming the critical health sector interventions and operations towards meeting the most significant targets and indicators of health and socio economic development as expected by the plan (MOH, 2005). This may be attributed to a set of factors, most of which are inter-related, such as absence of a legislative framework to support decentralization, lack of well-articulated, prioritized and cost-effective strategic plan; inadequate consultations amongst MOH staff themselves and other key stakeholders involved in the provision of healthcare services; lack of institutional coordination and ownership of the strategic plan leading to inadequate monitoring of activities; weak management systems; low personnel morale at all levels; and inadequate funding and low level of resource accountability.

As a result, the efforts made under NHSSP-I did not contribute towards improving Kenyans's health status. Rather, health indicators showed a downward trend whereby infant

and child mortality rates increased; the use of health services in public facilities declined. In 1990 there were 0.6 new consultations per person, while in 1996, there were only 0.4 new consultations per person. The doctor-to-population ratio declined from the 1980s to the 1990s. The public sector's contributions to healthcare stagnated, going from US\$12 per person in 1990 to US\$6 per person in 2002 (Muga *et al*, 2009). Overall this led to increased poverty levels from 47 percent in 1999 to 56 percent in 2002.

In a renewed effort to improve health service delivery, the Ministry of Health and other stakeholders reviewed the NHSSP-I service delivery system in order to devise a new strategy for making it more effective and accessible to as many people as possible (MOH, 2005). The Second Health Sector Strategic Plan proposed to improve service delivery by using the following levels of care delivery:

Figure 1. Levels of care delivery



Source: Overview of the health system in Kenya

Level 1, the community level, is the foundation of the service delivery priorities. Once the community is allowed to define its own priorities and once services are provided that support such priorities, real ownership and commitment can be expected. Important gains can be reached to reverse the downward trend in health status at the interface between the health services and the community.

Village Health Committees (VHC) are organized in each community through which households and individuals can participate and contribute to their own health and that of their village. Levels 2 and 3 (dispensaries, health centers, and maternity/nursing homes) will handle Kenya Essential Package for Health (KEPH) activities related predominantly to promotive and preventive care, but also various curative services. Levels 4-6 (primary, secondary and tertiary hospitals) undertake mainly curative and rehabilitative activities of their service delivery package. They will address to a limited extent preventive/promotive care.

Community-based approaches are often seen as 'soft' compared to vaccine or drug development, but in reality a whole package of approaches is needed (Feek, 2005). There are many examples where community action has been successful. In a community in Tigray, Ethiopia, community health workers and mothers act as co-coordinators to recognize and treat malaria, and childhood mortality has reduced by 40% (Kidane and Morrow, 2002). In rural Kenya, shopkeepers have received training to recognize malaria and dispense appropriate drugs. In one community, the treatment of childhood fevers with adequate doses of chloroquine has risen from 3.7 to 65% (Marsh, 1999). In several Latin American countries networks of volunteer workers have been established to detect malaria

cases. These networks have become a mainstay for malaria surveillance and anti-malarial drug treatment in many malaria control programmes (Ruebush and Goody, 1992).

In Bagamoyo, Tanzania, the Bednet Project found that posters and meetings had a limited impact on the predominantly Muslim population. A different approach was needed and when the Sheikh in each village was recruited to teach during Friday religious services about the merits of regular bed net impregnation, regular impregnation levels rose from a bare minimum to 53% and in some areas reached 98% (Mfaume *et al*, 1997). Involving local people in the process is therefore essential. Traditional healers who are consulted for treating convulsions and fever in children have been incorporated into local project activities. In Bagamoyo District in Tanzania, it was found that some served as members of village mosquito committees (Winch *et al*, 1996). This study also demonstrated that choice of terminology is critical in developing effective health communication interventions that relate to local people (Winch *et al*, 1996). Local terms for malaria can be numerous, have sub-categories and can be in a state of flux so that terms that make sense now will not make sense in a few years' time (Gordon, 2000). This presents a communication challenge for outsiders.

Uganda also came up with the community strategy which involved CHWs in antiretroviral distribution. The country has only one doctor serving about 22,000 patients. The nurses are now undertaking a range of tasks that were formerly the responsibility of doctors (Muthaka, 2012). Unlike their Kenyan counterparts, the nurses are managing people suffering from opportunistic infections such as herpes zoster, oral thrush and diarrhea (Muthaka, 2012). They also diagnose TB through sputum tests, prescribe medicine to prevent other infections and also determine whether a HIV positive person is eligible for antiretroviral therapy

(ART). The nurses have shifted some of their former tasks to the community health workers who have been given basic training in HIV testing, counseling and education (Muthaka, 2012). The CHW are also involved in filling in registers, triage-clinical follow up, taking weights and vital signs. Once a patient is initiated on ARVs the CHW will take over and they are also responsible for home delivery of the therapy. CHWs in Uganda include people living with HIV with no prior medical background (Muthaka, 2012). They follow a 12week course involving six weeks of classroom teaching and six weeks of clinical clerkship covering a comprehensive range of theoretical and practical clinical skills (Muthaka, 2012).

Community based approaches are also seen in Nyanza province where AIDS Population Health integrated Assistance (APHIA) II Nyanza project has forged linkages between existing government and community structures involved in capacity building, implementation, motivation and monitoring and evaluation of activities to ensure that community structures will continue accessing support from government offices, (APHIA II Nyanza Project, 2009). The project has supported the transfer of skills related to project design and implementation to the leadership of community structures. These structures now have the ability to design projects, mobilize resources, and manage funded activities. The project is encouraging community structures to sustain the use of improved or newly created referral systems. Since these referrals are not resource-intensive, community structures have the capacity to continue using them, (APHIA II Nyanza Project, 2009).

To be successful, CHW programmes require sufficient training, regular and reliable support and supervision, (Lehmann and Sanders, 2007). Offering CHWs supportive supervision within the structures and functions of the health team demonstrated better outcomes,

(Celletti *et al*, 2010). Another important factor contributing to the success of the Care Group model in increasing use of child health services and reducing child mortality in Gaza province, Mozambique was the supportive environment created among the volunteers within a "care group" as well as the close supervision from programme staff, which not only enabled appropriate decision-making by volunteers but also influenced their motivation and retention resulting in a very low dropout rate among village volunteers (Edward *et al*, 2007)

Supervision of CHWs in the Republic of Zambia's Kalabo District did not have a positive impact on performance because the quality was poor and almost half the CHWs did not experience any benefit from the supervision visits (Stekelenburg *et al*, 2003).

CHWs appreciate good supervision given with the honest intention of capacity building and mentoring. In Guatemala, supervised CHWs had attrition rates two to three times lower than those of unsupervised CHWs because their link with outside experts gave them higher status (Parlato and Favin, 1982).

In Ghana, non monetary incentives such as Identification cards, badges, or diplomas can provide security in politically volatile situations and are status symbols in the community. Many NGOs have given CHWs T-shirts, notebooks, caps, ponchos, and bags with identifying logos that promote group solidarity and facilitate entry into households during a project (Pearcy, 2000; Rubardt, 2000).

In Zambia, continuous training had been cited as an essential prerequisite for an effective CHW program (Frankel and Doggett, 1992) and an important factor in retaining the motivation of workers.

Sometimes training alone is enough to keep motivated workers going. La Leche League mothers in Guatemala continued to provide counseling and referrals four years after the end

of the project grant (Rasmuson *et al*, 1998). Their motivation was attributed to a combination of refresher training, annual workshops, peer support, and visible change.

2.1.1 Profile of community health strategy in Kibera

Community based approaches have been carried out where a collaboration of the government, UN-HABITAT and a contingent of NGOs, are making inroads into the settlements in an attempt to facelift the housing and sanitary conditions that will lead to reduction of diseases. Despite the óslum upgradingô by various NGOs the wellness of the population in Kibera has not improved as most people in the households cannot access referral systems due to very uneven topography in the area. Few houses have vehicle access, and many are at the bottoms of steep inclines which heightens the flooding risk (Davis, 2010).

As the Kenya government came up with the community health strategy, Kibera was divided into 13 community units (Map Kibera project, 2003).

The community is plagued by high levels of poverty, insecurity, underdevelopment and inadequate access to basic social services. These include basic health care, education, water and sanitation, inaccessibility due to poor roads and inadequate involvement of the government in provision of essential utilities and services.

AMREF and other NGOs have been working in Kibera since 1998 and they use an integrated approach to address issues on comprehensive care for people living with HIV, maternal, newborn and child health and Personal Hygiene and Sanitation Education (PHASE). AMREF reaches a population of between 35,000-45,000 in the four locations (out of 13) which include Kibera ï Laini Saba, Soweto, Mashimoni and Silanga (Davis, 2010).

The Community integrated programme supports a static health facility that provides outpatient services to children and adults and a 24 hour inpatient maternity service. The clinic also runs an ART program that provides care and treatment for HIV/AIDS and TB patients. So far, the project has enrolled over 6,000 patients for care in the programme with more than 3,000 having started ARVs treatment in the facilities, scaled up door to door awareness by CHWs on HIV percentages, reaching to an average of 70% of households, increased usage of maternity, family planning, ante/postnatal and child health care

A recent intervention was made by Kenya Water for Health Organization (KWAHO) where it is currently implementing a Solar Water Disinfection project as an effective and inexpensive initiative to enhance the community's access to safe drinking quality water at the household level (Yap, 2008).

2.2 Statistical models

This dissertation looks at binomial regression model as a way of analyzing data. Binomial regression was used because the dependent variables are binary i.e. had YES or NO responses and the probability remained constrained between 0 and 1. However, linear regression can also be used to analyze binary data. Its disadvantage is that it falls apart as the responses get towards 0 and 1, because a) the variance of the response tends to get smaller at those points, invalidating various ordinal least squares assumptions and b) you will get predicted values outside of the allowable (0,1) range (Jonathan and Michael, 2001). Logit and probit link functions were used to explore the accuracy and precision in logit and probit models.

2.2.1 Binomial regression

Binomial regression is a technique in which there are two possible responses/outcomes e.g Alive or dead, contaminated or not, germinate or not, species present or absent, (Cox *et al*, 1981).

Binary data occur in all fieldsi agricultural, biological, medical, social sciences. It could be grouped or not i binary (0, 1).

Grouped data have several subjects to constitute an experimental unit (a replication) i we record no. of successes y out of n subjects, (Cox and Snell, 1981).

The probability of a success is related to explanatory variables. A basic linear model is of the form:

$$\text{Data} = \text{pattern} + \text{residual}$$

Thus how much of the total variation in the data can be ascribed to a pattern associated with the treatments or covariates etc and the residual is variation we cannot explain, (Cox and Snell, 1981).

Given data that has a binomial distribution, a model that describes the relationship between the explanatory variables the X s and p i the probability/proportion is needed.

A link function say $g(p)$ that links p to the linear predictor of the model is used

There are three common types of link functions

(1) Logit: $\text{logit}(p) = \log \left(\frac{p}{1-p} \right)$

(2) Probit: $\phi^{-1}(p)$

where ϕ^{-1} is the inverse normal cumulative distribution

(3) Complementary log-log

$$\log(-\log(1-p))$$

The link function provides the relationship between the linear predictor and the mean of the response.

$$\log \left(\frac{p}{1 - p} \right) = \beta_0 + \beta_1 x_1 + \dots$$

The binomial distribution has a mean equal to $N \cdot P$ (N -sample size, P -proportion of cases), and a variance equal to the product of cases and noncases, pQ , wherein Q is equal to the proportion of noncases or $1 - p$.

Binomial regression follows the assumptions

- i) The error terms are independent.
- ii) There should be little or no multicollinearity. If multicollinearity is present centering the variables might fix, i.e. deducting the mean of each variable.
- iii) linearity of independent variables and log odds

2.2.2 Logit model

The logit model is used to predict the odds of being a case based on the predictor(s). The odds are defined as the probability of a case divided by the probability of a non case (Hosmer and Lemeshow, 2000). An odds ratio of one indicates that the odds of a case outcome are equally likely for both groups under comparison. The further the odds deviate from one, the stronger the relationship.

Logistic regression takes the natural logarithm of the odds (referred to as the logit or log-odds) to create a continuous criterion (Hosmer and Lemeshow, 2000). The logit of success is then fitted to the predictors using regression analysis. The results of the logit, however, are not intuitive, so the logit is converted back to the odds via the exponential function or the inverse of the natural logarithm (Menard, 2002).

Logit function

$$(a) \quad g(X) = \ln \frac{p(X)}{1-p(X)} = \beta_0 + \beta_1 X,$$

$$(b) \quad \frac{p(X)}{1-p(X)} = e^{(\beta_0 + \beta_1 X)}$$

(a) shows the logit function (b) the odds of being a case is equivalent to the exponential function of the linear regression equation. $g(X)$ refers to the logit function of some given predictor X . $\ln$ denotes the natural logarithm, $p(X)$ is the probability of being a case, β_0 is the intercept from the linear regression equation β_1 is the regression coefficient multiplied by some value of the predictor, base e denotes the exponential function. Given that the logit varies from $(-\infty, +\infty)$ it provides an adequate criterion upon which to conduct linear regression and the logit is easily converted back into the odds (Menard, 2002).

2.2.3 Probit model

The probit model uses a type of regression where the dependent variable can only take two values, 1 or 0.

It transforms the sigmoid response curve to a straight line that can then be analyzed by regression either through least squares or maximum likelihood (Albert and Chib, 1993).

Probit function:

$$\Pr(Y = 1 | X) = \Phi(X'\beta)$$

Where $\Pr$ denotes probability, and Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution. The parameters β are typically estimated by maximum likelihood.

Maximum likelihood estimation

Suppose data set $\{y_i, x_i\}_{i=1}^n$ contains n independent statistical units corresponding to the model above. Then their joint log-likelihood function is

$$\ln L(\beta) = \sum_{i=1}^n (y_i \ln \Phi(x_i \beta) + (1 - y_i) \ln (1 - \Phi(x_i \beta)))$$

The estimator $\hat{\beta}$ which maximizes this function will be consistent, asymptotically normal and efficient provided that XX' exists and is not singular (McCullagh and Nelder, 1989). It can be shown that this log-likelihood function is globally concave in β , and therefore standard numerical algorithms for optimization will converge rapidly to the unique maximum (McCullagh and Nelder, 1989). Asymptotic distribution for $\hat{\beta}$ is given by $\sqrt{n}(\hat{\beta} - \beta) \xrightarrow{d} N(0, \Omega)$ and $\Omega = \Phi'$ is the Probability Density Function (PDF) of standard normal distribution.

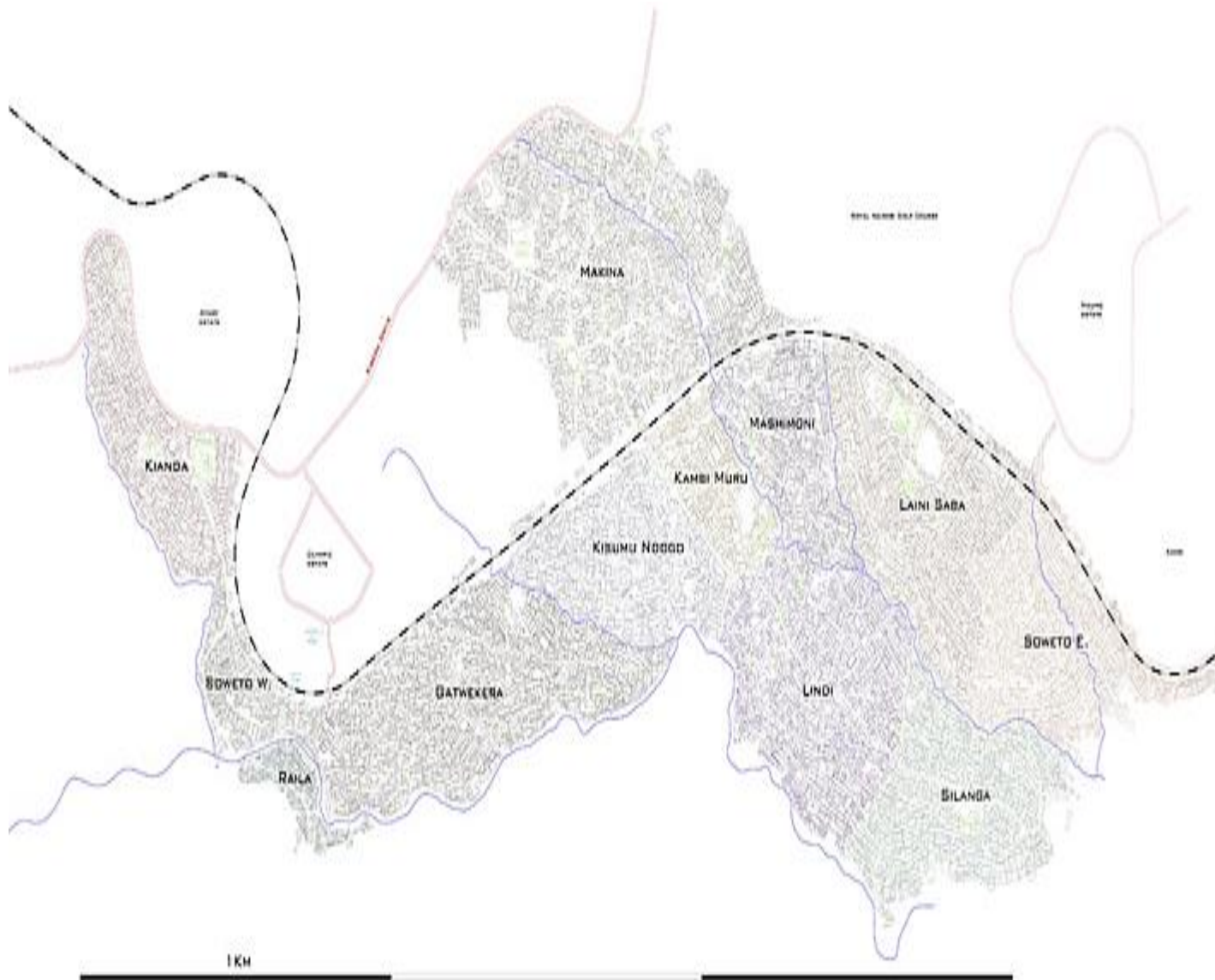
$$\Omega = E \left[\frac{\phi(x \beta) (x \beta)}{\phi(x \beta) (1 - \phi(x \beta))} x x' \right], \quad \Phi' = \sum_{i=1}^n \frac{\phi(x_i \beta) x_i x_i'}{\phi(x_i \beta) (1 - \phi(x_i \beta))}$$

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study area

The study was conducted in Kibera division. Kibera is located in the outskirts of Nairobi, Kenya and is approximately 5 kilometers from the city centre, (Map Kibera, 1999). This division is the largest slum in Nairobi, and the second largest urban slum in Africa, (Map Kibera, 1999). In 2009 the Kenya Population and Housing Census reported Kibera's population as 170,070 with an average of one pit latrine for every 50 to 500 people. Below is a Map of Kibera showing different regions in the area.



3.2 Study design

The design was a cross sectional study where the respondents were drawn from the socially deprived urban slum of Kibera in Nairobi city.

3.3.1 Study Population

The study population consisted of one group (cohort) which included 10 to 17 community health workers (CHWs) per community unit.

3.3.2 Sampling frame

Stratified sampling was used to select the CUs to be sampled, after which random sampling was used to select the particular CHWs to be interviewed. The total number of 7 CUs and 92 CHWs were sampled. They included Katekwera (11), Laini saba (13), Soweto East (12), Soweto West (13), Silanga (14), Mashimoni (12) and Kianda (17).

Katekwera, Laini saba, Silanga and Mashimoni consist of approximately 2000 households (Map Kibera, 1999). While Soweto east, Soweto west and Kianda consist of approximately 3000 households (Map Kibera, 1999).

3.4 Research procedure

The respective questionnaires were first piloted on a health facility stationed at Wangige in Nairobi and a revision on ambiguous questions done. This confirmed how the questions were understood by the participants. The interviewer then issued out the questionnaires (Appendix 1). The interviewers were on the sites during data collection to help in interpretation of complex questions. Data entry and cleaning was done in excel.

3.5 Methods of Data Collection

Primary data from community health workers was collected using a questionnaire which contained both closed and open ended questions. An excel tallying tool was developed and coded appropriately. YES response was coded as 1 while a NO response was coded 0. Missing values were represented by N/A

3.6 Methods of data analysis

After data entry and cleaning was done in excel spreadsheet, the file was saved as comma delimited for import to R. R was used to analyze the variables; incentives, support supervision, training and their effect on CHW satisfaction was established.

Descriptive statistics and use of bar graphs were used to illustrate performance of support supervision, incentives and training in the 7 community units.

Binomial Regression in which support supervision, incentives and trainings received as a health worker was regressed on the identified individual, and satisfaction using the methods of odd ratios

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of study sample

It was seen that most of the community health workers were Females with Mashimoni and Soweto West (80%), having the most number of female community health workers (figure 2). The same CUs had the least number of male community health workers.

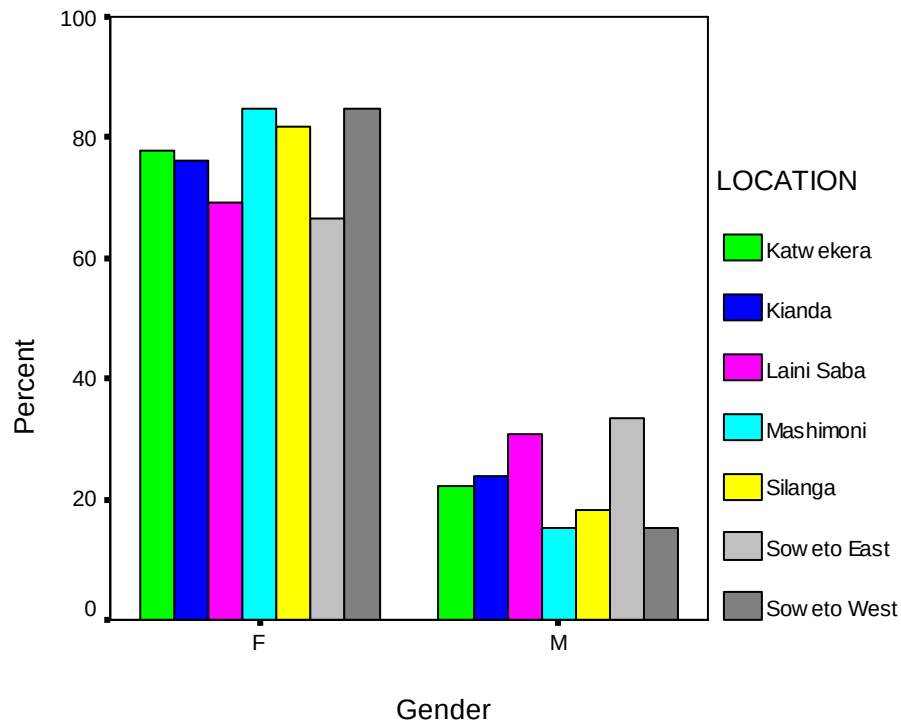


Figure 2: Bar graph showing the gender of Community Health Workers in the 7CUs

Most of the CHWs in the 7 CUs were married. In Silanga, about 90% of CHWs were married. (figure 3). The CHWs' age ranged from 25yrs to 48 yrs . (figure 4)

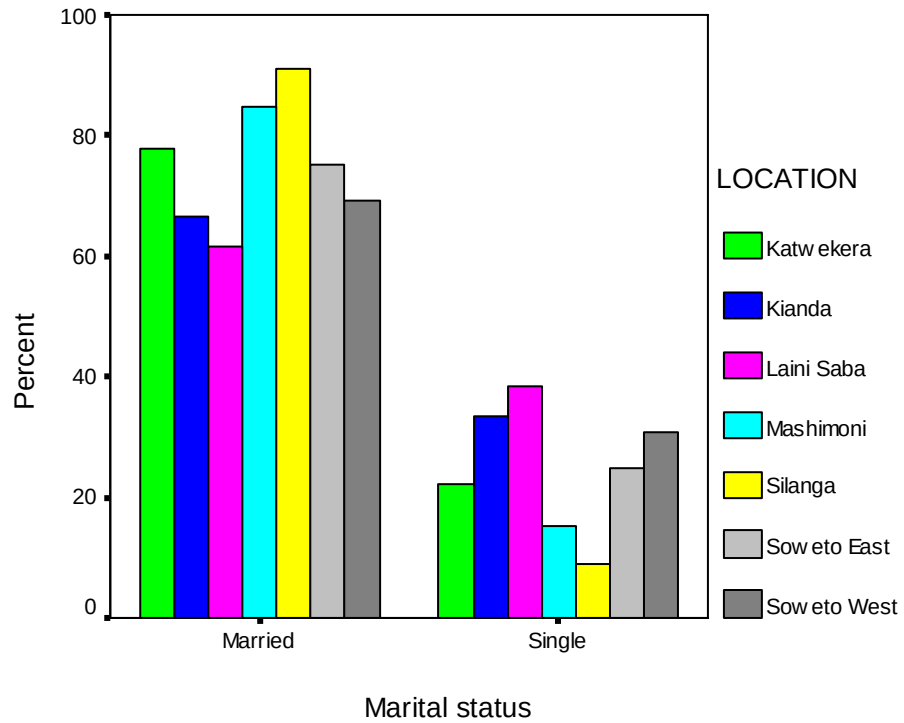


Figure 3: Bar graph showing overall Community Health Workers marital status

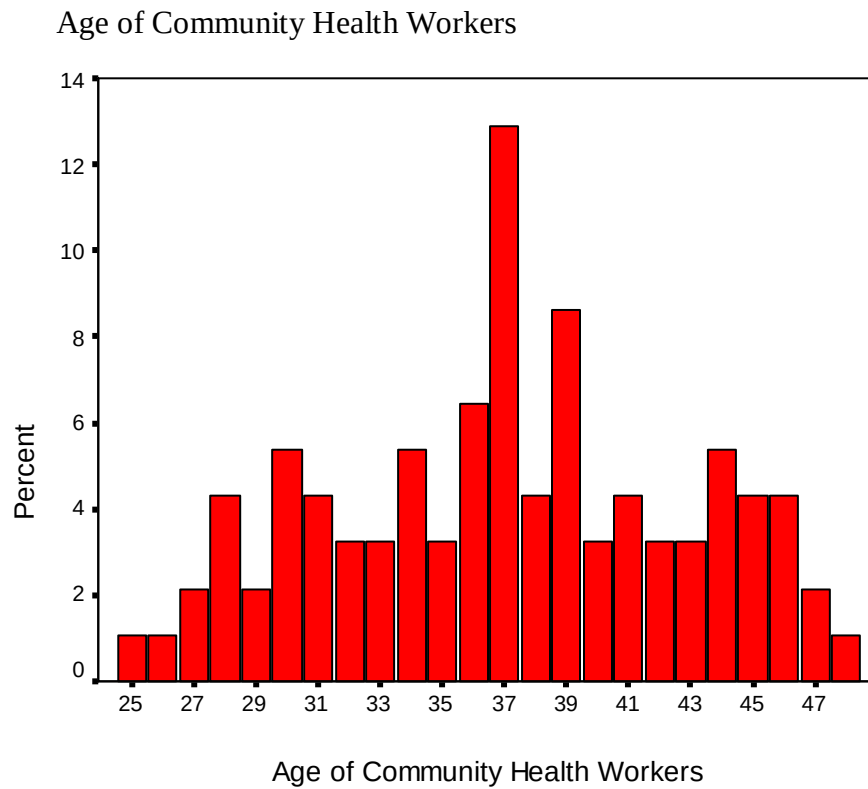


Figure 4: Bar graph showing the age of community health workers

It was also noted that 85% of CHWs have attained O-level certificate. About 5% of CHWs had attained a diploma. (Figure 5).

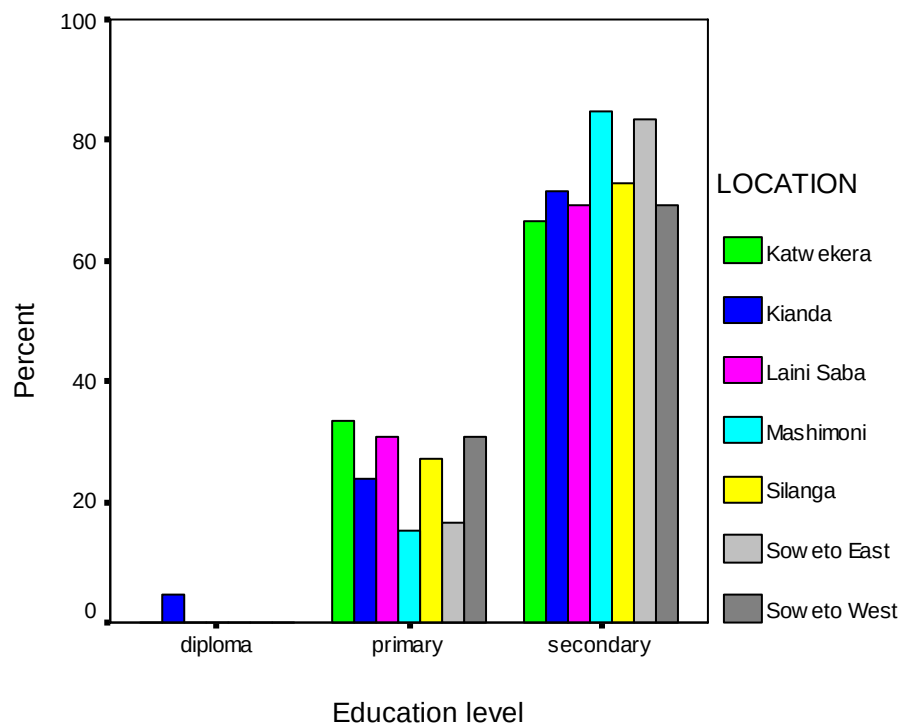


Figure 5: Bar graph showing level of education of Community Health Workers

4.2 Evaluating support supervision received in the 7CUs

Support supervision was done by Community Health Extension Workers after every 6 months. Silanga had the highest number of CHWs who are satisfied with support supervision, (45%). Katekwera had the most unsatisfied CHWs, (100%). (Figure 6).

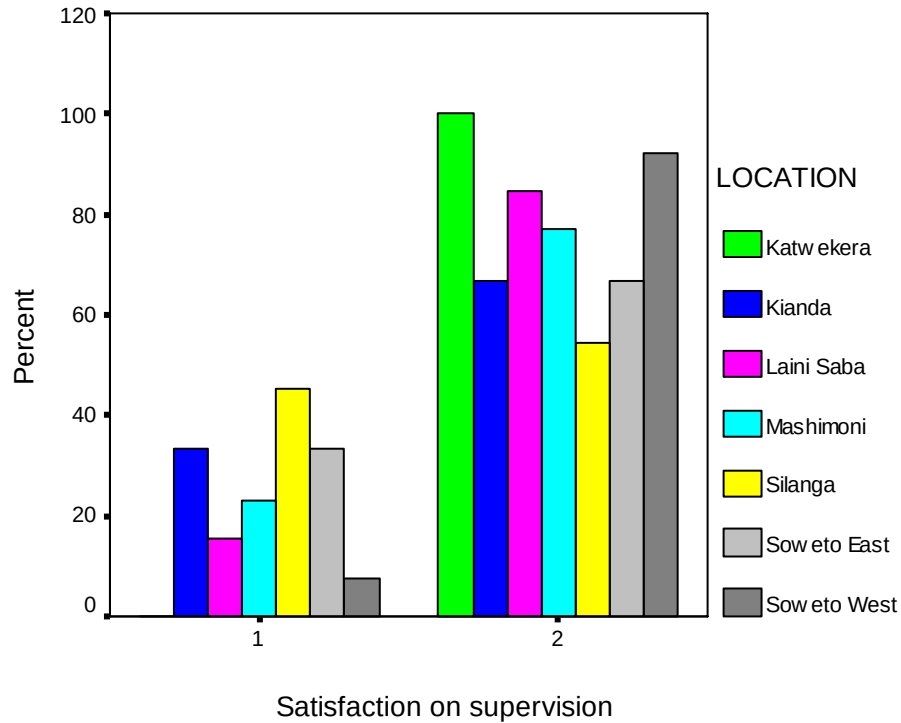


Figure 6: Bar graph showing Satisfaction in support supervision in the 7CUs, (1=Yes, 2= No).

The frequency of support supervision after 6 months was evaluated. It had three levels i.e. 1) 1 to 3times 2)3-6 times 3)7-15 times (figure 7). It was noted that most CHWs received support supervision at least once. CHWs in Laini Saba and Mashimoni had received the most frequent support supervision in 6 months ie 7-15 times.

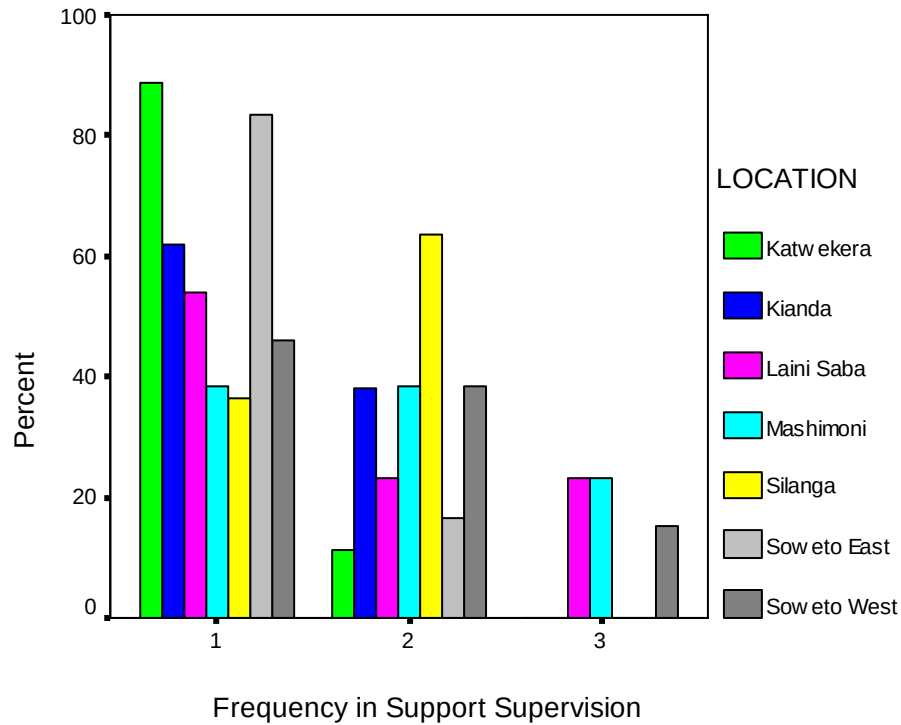


Figure 7: Bar graph showing frequency in support supervision in the 7CUs (1=1-3 times, 2= 3-6 times, 3= 7-15 times)

A binomial regression was done to investigate the effect of the frequency in support supervision on CHW satisfaction. It was noted that using frequency 3(7- 15) times as the reference, only frequency 1 (1-3 times) had a significant difference ($p=0.003$) on satisfaction (table 1).

Table 1

Coefficients	Estimate	SE	Z value	Pr(Z)
(intercept)	0.44992	0.25439	-1.769	0.07696 .
FREQ1	0.58982	0.31687	2.6589	0.00317 **
FREQ2	-1.6582	0.8997	-1.843	0.0653

Interpretation using odds ratio: For every increase in support supervision (0-3 times), the odds of CHW satisfaction increases by a factor of 2.4567.

For every increase in support supervision (3-6 times), the odds of CHW satisfaction increases by a factor of 0.23117.

4.3 Evaluating the number of Trainings received in 7CUs

It was noted that Katwekera had the highest number of CHWs trained followed by Soweto East and Mashimoni. Kianda had the least number of trained CHWs followed by Soweto West (figure 8). CHWs in Katekwera had received the following trainings; Leadership skills, communication skills, family planning, breastfeeding, Nutrition, Home based care, Personal hygiene, Maternal health, and child and drug abuse.

Trainings received by CHWs in Kianda included personal hygiene, health and nutrition, leadership and communication skills, antenatal and family planning. Laini Saba received health and nutrition, first aid, prevention of mother to child transmission (PMTCT) of HIV, home based care, TB management and public health and sanitation. Mashimoni received communication and leadership skills, child abuse, home based care, PMTCT of HIV, first aid, immunization and antenatal care. Silanga received maternal health, public health and sanitation, drug abuse, communication skills, personal hygiene and PMTCT of HIV. Soweto East received public health and sanitation, child and drug abuse, home based care, personal hygiene, first aid, communication skills, PMTCT of HIV, leadership skills and antenatal care. Soweto West received antenatal care, home based care, family planning, personal hygiene and public health

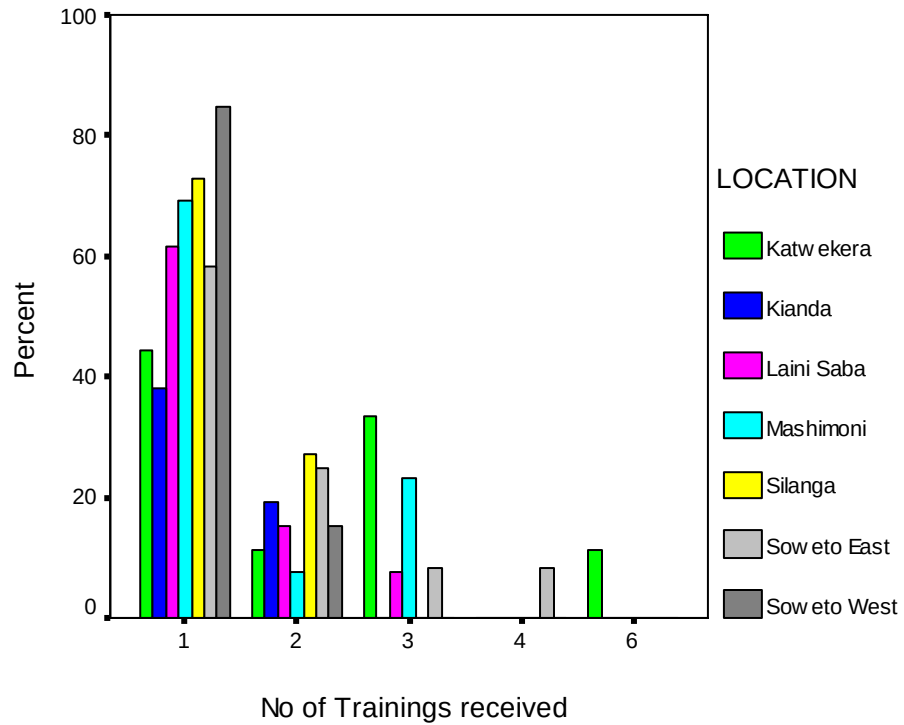


Figure 8: Bar graph showing the number of trainings in the 7CUs

It was seen that there was variation in satisfaction in training in the 7CUs (figure 9). Silanga had the highest proportion of CHW being satisfied with training, (65%) while Mashimoni and Soweto West showed the highest number of unsatisfied CHWs with training, (68%).

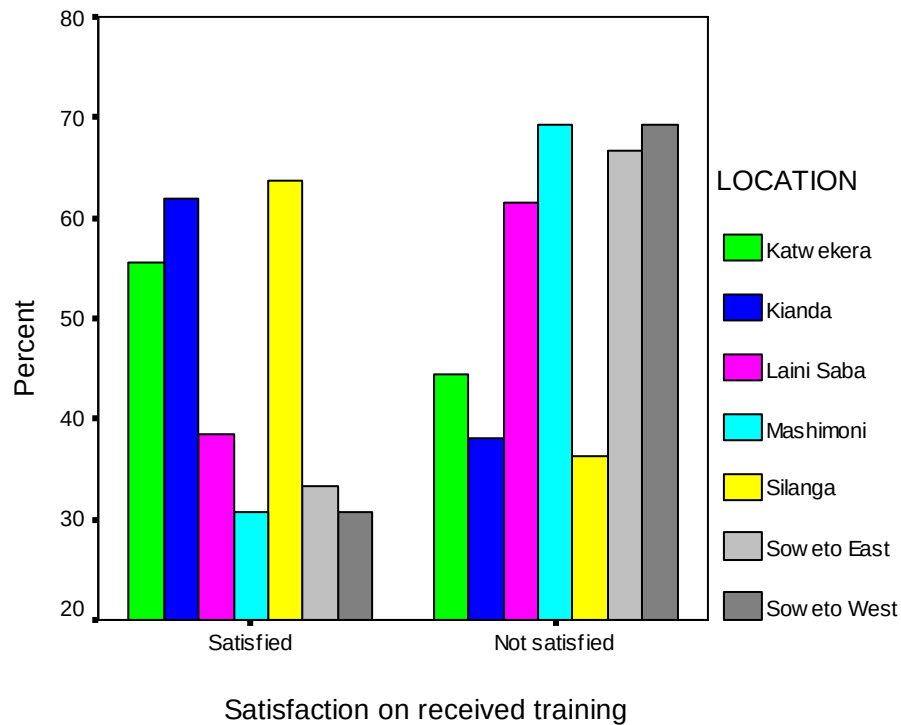


Figure 9: Bar graph showing CHW satisfaction in training in the 7CUs

The current training needs by Community Health Workers included first aid, counseling, PMTCT of HIV, maternal, newborn and child health (MNCH), refresher courses, exchange programmes, HIV and AIDs, communication skills and how to handle communicable diseases. First aid and refresher courses were the trainings that most CHWs needed (figure 10).

CURRENT TRAINING NEEDS

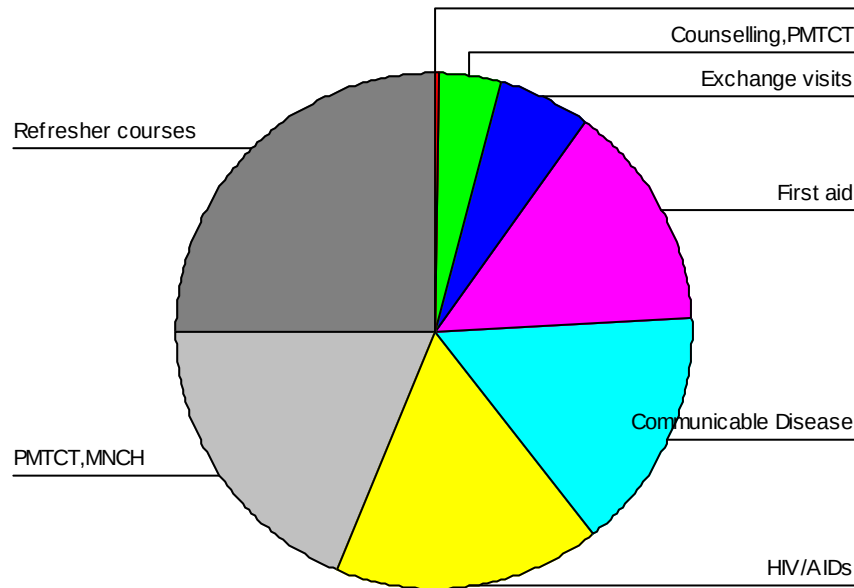


Figure 10: Pie chart showing overall CHWs current training needs

4.4 Evaluating incentives received in 7CUs

It was noted that there were two incentives provided to the CHWs, namely means of transport and CHW kits. Most of the CHWs had no means of transport (figure 11). Majority of the CHWs with a means of transport used bicycles denoted as 1 as compared to Motorbikes (5). Silanga had the highest number of CHWs using bicycles, (65%) and Kianda had the highest number of CHWs using motorcycles, (27%). Most of the CHWs in Laini Saba, (62%) have no means of transport while Katekwera don't have any motorcycles.

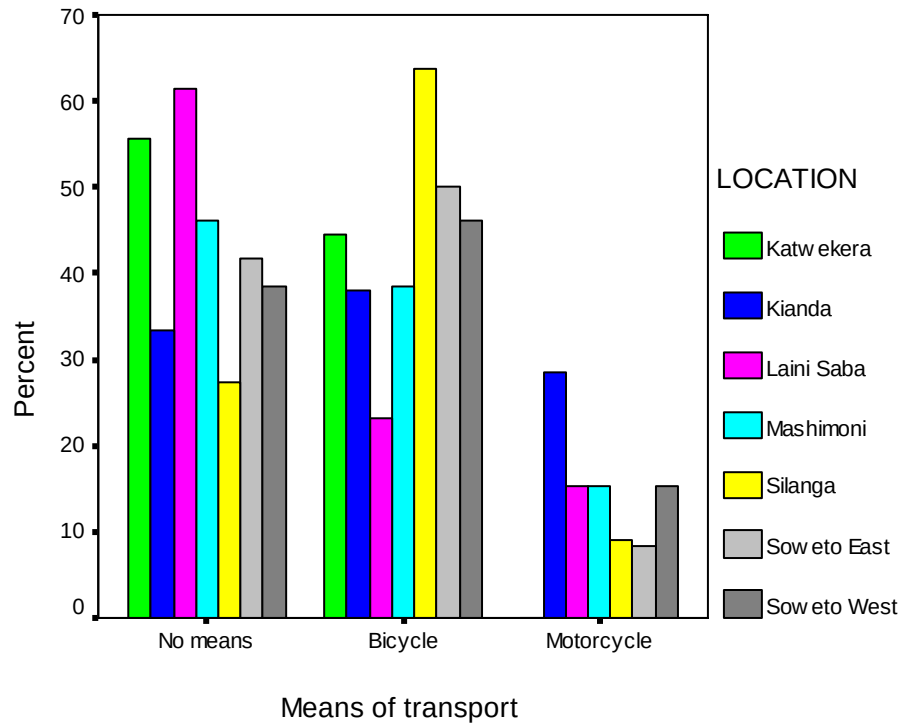


Figure 11: Bar graph showing various means of transport in the 7 CUs.

All the CHWs were not satisfied with CHW kits used for treating patients (figure 12). It was seen that the kit neither contained first aid contents, Deworming tablets, condoms nor a Salter scale.

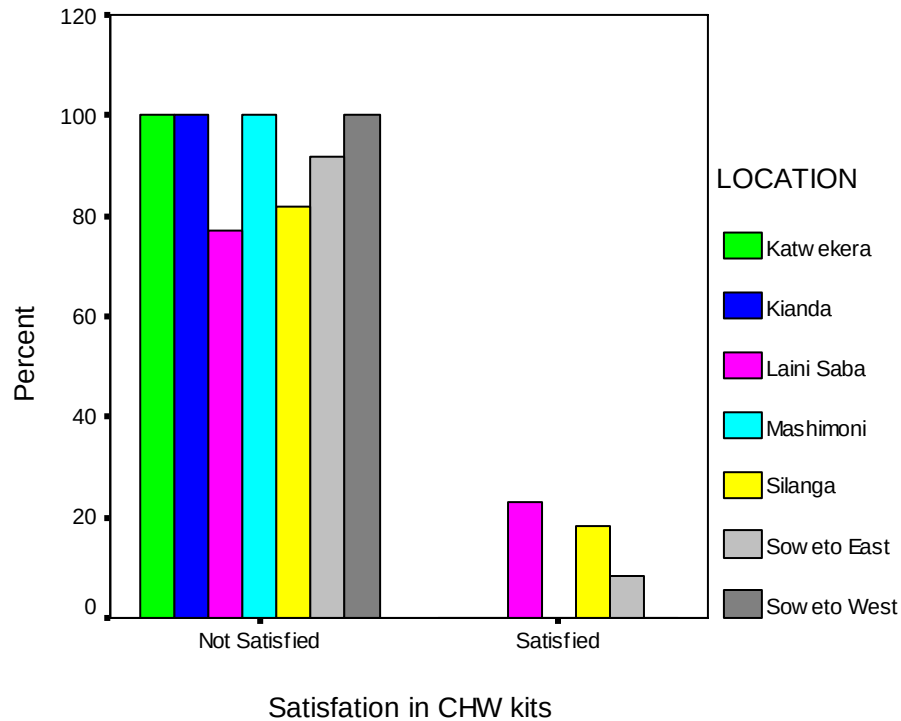


Figure 12: Bar graph showing community health worker satisfaction in CHW kits in the 7CUs.

4.5 Modeling the effect of incentives, Support supervision and training on CHW satisfaction using binomial regression.

4.5.1 Categorical variables frequency

It was seen that 55% of the CHWs in the 7CUs were satisfied with support supervision while 45% were not satisfied with support supervision (Table 3). 34% of the CHWs in the 7CUs received were satisfied with incentives while 66% were not. 38% of the CHWs in the 7CUs were satisfied with training while 62% were not satisfied.

This is illustrated in the table below

Table 2: Frequency of satisfaction in supervision, incentives and training.

<u>VARIABLE</u>	<u>FREQUENCY(PERCENTAGE)</u>	
	<u>YES</u>	<u>NO</u>
Supervision	49 (55%)	40 (45%)
Incentive	30 (34%)	59 (66%)
Training	34 (38%)	55 (62%)

4.5.2 Binomial regression

A binomial regression model helps to establish the relationship between a binary outcome variable and a predictor variable. It models the logit-transformed probability as a linear relationship with the predictor variables ie $\text{logit}(p) = \log(p/(1-p)) = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 \dots + \beta_k * X_k$

Where:

Log (p/ (1-p)) is the log odds

β_0 is the constant

$\beta_1 \dots \beta_k$ are the model predictor variables coefficients

$X_1 \dots X_k$ are the predictor variables

Hypothesis Testing

H_0 = There is no statistical evidence that support supervision, training and Incentives have a significant effect on community health worker satisfaction

H_1 = There is a statistical evidence that support supervision, training and incentives has a significant effect on community health worker satisfaction

A binomial regression model was fitted where support supervision, training and incentives were used as predictor variables (Table 3).

Table 3: Logistic regression model output

Coefficients	Estimate	SE	Z value	Pr(Z)
(intercept)	-0.7158	0.4178	-1.713	0.08669
Supervision	0.1091	0.4620	0.236	0.81335
Training	1.2912	0.4925	2.621	0.00876**
Incentive	1.0393	0.5000	2.079	0.03765*

AIC: 119.97

Odds Ratio
 (Intercept) Supervision training incentive
 0.4888106 1.1152631 3.6370847 2.827242

4.5.3 Results

P value for training and Incentives was 0.00876 and 0.03765 respectively. Hence we reject the null hypothesis because $\hat{U} < 0.05$ and conclude that training and incentives had a significant effect on satisfaction. However, supervision had no significant effect on community health worker's satisfaction since the p value was > 0.05 ie 0.81335.

4.5.4 Fitting the Model

$$\log\left(\frac{\hat{\pi}}{1-\hat{\pi}}\right) = -0.7158 + 1.0393 * \text{Incentives} + 0.1091 * \text{Supervision} + 1.2912 \text{ training}$$

Interpretation

Using No (0) as the reference group, for every increase in incentive, the odds ratio of community health worker satisfaction increases by a factor of 2.827. For every increase in training, the odds ratio of community health worker satisfaction increases by a factor of

3.64. For every increase in support supervision, the odds ratio of community health worker satisfaction increases by 1.11

4.6 Probit analysis

Probit analysis was done in order to compare the accuracy and precision of estimates with the logit model.

Hypothesis testing

H_0 = There is no statistical evidence that support supervision, training and Incentives have a significant effect on community health worker satisfaction

H_1 = There is a statistical evidence that support supervision, training and incentives has a significant effect on community health worker satisfaction

Call:

```
glm(formula = satisfaction ~ Supervision + training + incentive,  
     family = binomial(link = "probit"))
```

Table 4: Probit analysis

Coefficients	Estimate	SE	Z value	Pr(Z)
(intercept)	-0.44992	0.25439	-1.769	0.07696
Supervision	0.07787	0.28242	0.276	0.78275
Training	0.79822	0.29687	2.689	0.00717**
Incentive	0.64580	0.30238	2.136	0.03270*

AIC: 119.98

Results

P value for training and Incentives was 0.00717 and 0.0327, respectively. Hence we reject the null hypothesis and conclude that training and incentives had a significant effect on satisfaction. However, supervision had no significant effect on CHWs satisfaction.

Interpreting coefficients

The probit regression coefficients give the change in the z-score or probit index for a one unit change in the predictor. For a one unit increase in support supervision, the z-score increases by a factor of 0.078. For one unit increase in training, the z-score increases by a factor of 0.7982. For one unit increase in incentives, the z-score increases by a factor of 0.646.

4.7 Model Comparisons

```
p1 <- glm(satisfaction ~ Supervision+training+incentive, family = binomial(link = "probit"))
> mfx(p1)
```

Table 5: Marginal effects in probit

	Marginal effects	Standard error
Supervision	0.02791716	0.1030299
Training	0.28615791	0.1145779
Incentive	0.23151592	0.1121546

```
p1 <- glm(satisfaction ~ Supervision+training+incentive, family = binomial(link = "logit"))
> mfx(p1)
```

Table 6: Marginal effects in logit

	Marginal effects	Standard error
Supervision	0.02393761	0.1033202
Training	0.28332315	0.1180106
Incentive	0.22805316	0.1144063

Interpretation

The estimated marginal effects for supervision, i.e. the increase in the probability of being satisfied for a unit increase in supervision, were 2.4% and 2.8% in logit and probit models. The estimated marginal effects for training, i.e. the increase in the probability of being

satisfied for a unit increase in training, were 28.3% and 28.6% in logit and probit models. The estimated marginal effects for incentives, i.e. the increase in the probability of being satisfied for a unit increase in incentive, were 22.8% and 23.5% in logit and probit models. The differences seen in logit and probit are i.e. 0.4, 0.3 and 0.7, respectively. The AIC for logit and probit model was 119.97 and 119.98 respectively.

CHAPTER FIVE

DISCUSSION

Inadequate training and incentives were observed to be the main causes of dissatisfaction to CHWs. From the study 62% (Table 2) of the CHWs were unsatisfied with training because they were not fully schooled on how to address most of the health issues facing their communities. CHWs receive only 4 basic training sessions that encompass home-based care, nutrition, family planning, and personal hygiene. The dissatisfaction on training has contributed to the immense limitations seen on CHWs especially in delivering services to the community. The reason being their inability to handle other cases that are not within their purview such as maternal and neonatal health needs, handling communicable diseases, PMTCT of HIV, first aid, communication skills, and HIV and AIDs. Another notable factor was the lack of refresher training to CHWs. A group discussion conducted revealed that the CHWs received training back in 2010 and none has attended a refresher training to-date. The refresher training is important because it helps in recalling and reinforcement of previously acquired knowledge and skills. Differences in training in the various CUs were due to lack of synchronized training syllabus and presence of different NGOs training CHWs according to their diverse interests.

With regard to satisfaction, 38% of the CHWs were content with the training received. According to the findings, this is attributed to more than 6 sessions of training or more. The training entailed MNCH, PMTCT, personal hygiene, communication skills, home-based care, and nutrition among others. The CHWs have also in one way or another received extra training privately from other learning institutions. Learning skills was one of the main reasons that CHWs volunteer. Training provides an opportunity to interact with

professionals, learn skills and receive education. In Nepal, training allowed CHWs diagnose night blindness and also identify fast breathing as a sign of acute respiratory infection (ARI), (Curtale *et al*, 2005). The fact that they could treat and diagnose these diseases highly motivated the CHWs, (Curtale *et al*, 2005). CHW training like any other has to be conducted regularly and continuously thus the need for refresher courses. In a study in Sri Lanka CHWs reported that they often had to go to the public health nurse midwife to get an answer, and then tell the householder. When that happened, the community lost faith in them and refused to accept any advice given to them (Walt *et al*, 2009). In such instances the CHWs lose their standing in society; this only goes further to reinforce the fact that training motivates the volunteers. Refresher courses also serve to maintain motivation considering the low levels of education of the volunteers. According to Winch *et al*, 2001, refresher courses allow volunteers to gain new skills, interact with peers and promote personal development.

The findings from this study also indicated that 66% of the CHWs were unsatisfied due to lack of incentives (Table 2). During the group discussion, it was noted that the most important incentives were means of transport, CHW tool kits and monthly stipend. In July 2010, the Ministry of Public Health and Sanitation promised CHWs a monthly payment of Ksh 2000 as performance-based incentive, and CHW tool kit. The ministry only fulfilled their promise for the first year and since then no incentives have been availed. Due to the high levels of poverty, the CHWs absconded duty in order to look for other means to feed their families even though it was on voluntary basis. According to Philips (1999), there are many advantages of providing cash incentives. Firstly, the CHWs could be asked to work for longer hours; secondly, rigorous supervision can also be exercised. Thirdly, programs can be implemented within time and under a standardized work routine. Lastly, CHWs can

maintain the required service quality required. Gray and Ciroma (1987) also cite a study in Gongola, Nigeria where cash incentives drastically reduced attrition rate among paid workers. They point out that in a Rural Health Program community health workers left their posts after one to three years. Men with higher incomes were found to have stayed for an average of 3.25 years while those with lower incomes only stayed for 2 years (Gray and Ciroma, 1987). In Ethiopia the attrition rate reduced from 85% to zero within a year because a modest stipend was introduced. Each household contributed a mere one birr (equivalent to 2Ksh) per year to cater for the CHWs (Wubneh, 1999).

Results illustrated in Table 2 show that 34% of CHWs were found to be satisfied with incentives. This was also attributed to provision of tool kits (apart from cash) and the fact that most of them are self employed while others are in the informal labor market (such as Masonry, painting, tailoring and simple *fundis*) thus able to support themselves and their kin. Even though the toolkits are non monetary, the CHWs found this as a source of commitment.

Buenavarte, (2000) argues that in-kind payments are less prone to comparison. He gives an example of Peru where beneficiary families would work (in turns) for free in farms belonging to the CHWs. A similar incentive to tool-kits is the provision of bags to carry supplies, agriculture tools, rain coats, and backpacks, supplies for home improvement, educational materials and seedlings. These incentives made CHWs feel appreciated (Winch *et al* 2001).

From table 2, it was seen that 45% of the CHWs were found to be unsatisfied with supervisory support that they received. It was seen that at least 1-3 times of support supervision made a significant effect on CHW satisfaction. Some suggestions made by

CHWs was more frequent supervision as this gave them opportunities to discuss problems, and exchange information.

To be effective, supervisory visits should be regular and based on a common understanding of the purpose of the visit. CHWs appreciate good supervision given with the honest intention of capacity building and mentoring.

In Guatemala, according to Parlato and Favín (1982), supervised CHWs had an attrition rate of 2 to 3 times lower than unsupervised CHWs. This they attribute to the interaction between the experts and CHWs that was viewed as giving them a higher status in society (Parlato and Favín 1982). Other scholars have also attributed low rates of retention to weak, inadequate, and inconsistent supervision (Frankel and Doggett, 1982; Ofusu-Amaah, 1983; Heggenhougen *et al*, 1987; Walt *et al*, 2009; Curtale *et al*, 1985). Supervisory visits also help reduce the feelings of isolation that often accompany a CHW's occupation (Curtale *et al*, 2005).

Community health workers are the frontline resource persons for community-based health services. CHWs play a critical role in the overstrained healthcare system, filling the information and distribution gap between people wanting health options and the clinics that provide a range of health services to huge populations, particularly in urban poor communities.

CHWs must be respected literate members of the community. They are volunteers who work hard because they are on duty at all times. CHWs can be called upon by the community at any time of day or night.

Training and incentives are vital to keeping CHWs involved and engaged in the community work. In order for CHWs to make an effective contribution, they must be appropriately trained and supervised, but also adequately and continuously supported. The major

challenge in the community health strategy is retaining volunteers for a long period of time because most community health workers are poor and require an income to sustain themselves and their kin.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

Community health workers play a major role in alleviating the shortfall of physicians, midwives and nurses across the community. These effects are highly pronounced in developing countries especially in Africa where pressing health requirements cannot be fulfilled. The shortfall of professional medical practitioners has forced countries like Kenya to rely on CHWs to deliver life-saving interventions in slum dwellings like Kibera. It is therefore crucial for the government to strive and maintain a particular number of motivated CHWs.

CHWs are part of and are influenced by the larger cultural and political environment in which they work. They should be well trained in various health issues so that they are able to play their roles efficiently and effectively.

Incentives play a major role in CHW satisfaction. There are two types of incentives i.e. monetary and non monetary incentives. Monetary incentives can increase retention since the CHWs are poor people trying to support their families. However, monetary incentives may bring problems; the money may not be enough, it may not be paid regularly or may stop altogether. Non monetary incentives are critical to satisfaction of CHWs. They need to be given tool kits, supportive supervision, appropriate training and refresher courses. Small tokens such as identification badges may give CHWs a sense of pride in their work and increased status in their communities. Appropriate job aids such as counseling cards and regular replenishment of supplies could ensure that they feel competent in their jobs

Probit and logit models give almost the same estimates. Logit model was easier to understand and interpret as estimates are calculated directly.

This study recommends an extension of the implementation of the Community Health Strategy period, a review on the incentives, supervision and training curriculum of the CHW. It also recommends provision of tool kits and reporting tools to CHW. This study did not delve into the quality of the work done by CHWs, an area that could give more information if researched on.

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Appendix 1: Questionnaire

This questionnaire is meant to collect information that would be useful in evaluating the implementation of community health strategy. Any information provided by you will be held private and confidential and would not be disclosed to any person. Analysis of the questions from the questionnaire will be done together with others to ensure anonymity. You are required to answer all the questions to the best of your knowledge. Thank you for willing to participate.

CODE _____

SECTION 1

PERSONAL DETAILS

1. CHWs name _____

2. Sex _____ 3. Marital Status _____ 4. TEL.NO. _____

5. Date of Birth / / 6. Place of birth _____

7. Estate of residence _____

8. Religion _____

9. Education level _____ 10. Occupation _____

SECTION 2

A SUPERVISION

11. Are you satisfied with supervisory support received? 1)Yes 2) NO

12. If yes, how frequently do you receive supervision?

1) 1-3times 2)3-6 times 3)7-15 times

13. What are some of the Suggestions you would make on support supervision.

B TRAINING

14. Have you received any training since you became a volunteer? 1) Yes 2) NO

15. If yes, are you satisfied with the trainings received? 1) Not satisfied 2) satisfied

16. State the trainings you have received since you became a volunteer

17. What are your current training needs?

C MOTIVATION

19. Have you received any incentives since you became a CHW? 1) Yes 2) NO

20. If yes, are you satisfied with incentives received? 1) Not satisfied 2) Satisfied

21. What Incentives /ways would help improve your motivation as you play your roles in the CS?

D. TRANSPORT

22. Are you provided with any mean of transport 1) Yes 2) No?

23. If yes, what means of transport is available 1) bicycle 2) animals 3) ambulance 4) foot, 5) motorcycle

E CHW KIT AND ITS CONTENTS

24. Do you have enough CHW kits for treating patients 1) Not satisfied 2) satisfied

25. If yes, does it contain first AID contents, gloves, swabs, strapping bandage 1) Yes 2) No

26. Does the CHW kit contain De-worming tablets 1) Yes 2) No

27. Does the CHW kit contain Condoms

1) Yes 2) No

28. Does the CHW kit contain a Salter scale

1) Yes 2) No

