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IMPLEMENTATION OF THE WARD BASED PRIMARY HEALTH CARE OUTREACH TEAMS IN THE EKURHULENI HEALTH DISTRICT: A PROCESS EVALUATION

Carmen Whyte

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, in partial fulfillment of the requirements for the degree of Master of Medicine in the branch of Community Health

Johannesburg, November 2015

DECLARATION

I, Carmen Whyte, declare that this research report is my own work. It is being submitted for the degree of Master of Medicine in the branch of Community Health, in the University of Witwatersrand, Johannesburg (Appendix A: plagiarism form)



_____

Carmen Whyte

05 November 2015

DEDICATION

I dedicate this work to my late brothers Larry Barth and Wayne Abrahams.

To my husband Aldaine Whyte for your constant support, love and understanding.

To my four amazing and wonderful parents who have always been there for me.

Most importantly to my refuge and strength Jesus Christ.

PRESENTATIONS ARISING FROM THIS STUDY

Whyte C, Thomas L, Kawonga M. The Implementation of the ward based primary health care outreach teams in the Ekurhuleni health district: a process evaluation. 14th Annual Ekurhuleni Research Conference, Kempton Park Johannesburg. 12 November 2014. (First prize winner for best oral presentation)

ABSTRACT

Introduction: One of the aims of the re-engineering of primary health care in South Africa is to strengthen the health system and improve accessibility of health services through ward based outreach teams (WBOTs) comprising of nurses and community health workers.

Aim: To evaluate the implementation of WBOTs against national guidelines and identify Community Health Worker (CHW) characteristics that influence adherence to guidelines regarding the referral and follow up of maternal and child health clients.

Methodology: This cross-sectional study was conducted during 2013. All 9 WBOTs at the time were included in the study. Data were collected through: a questionnaire survey; key informant interviews and a review of records of pregnant, post-natal women and unimmunized children under five. A process evaluation was conducted to describe inputs (training, team composition, resources, and knowledge); processes (service delivery, referral linkages, support and supervision) and outputs (number of clients referred and followed up). Logistic regression was performed to identify CHW characteristics (Age, education, experience, training, and knowledge) associated with adherence to national guidelines.

Results:

WBOT had sufficient numbers of CHWs within the team; however lacked sufficient knowledge and resources required to conduct household visits. CHWs adhered to the guidelines regarding the follow up of maternal clients with 85% of CHW having conducted the required number of follow up visits for pregnant and postnatal women. However, only 29% of unimmunized children were appropriately followed up. Challenges identified included: lack of supervision, limited resources, and poor knowledge. There was no statistically significant association between CHW characteristics and adherence to guidelines.

Conclusion and recommendations: This study highlights the challenges that need to be addressed around the WBOT implementation. It is recommended that there is improvement in resource availability, CHW supervision, capacity and training to improve the implementation process of future teams.

Key words: Ward Based Outreach Teams, Primary Health Care re-engineering, Community Health Worker

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ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
CHW	Community Health Workers
DOH	Department of health
DOTS	Directly Observed Therapy
EHD	Ekurhuleni Health District
EHP	Environmental Health Practitioner
EN	Enrolled Nurse
FHP	Family Health Program
FHS	Family Health Strategy
FM	Facility Manager
HBC	Home Based Care
HH	Household
HHV	House Hold Visits
HIV	Human Immunodeficiency Virus
HP	Health Promoter
MCH	Maternal and Child Health
MUAC	Mid Upper Arm Circumference
NCD	Non Communicable Disease
NDOH	National Department Of Health
NGO	Non-Governmental Organization

No.	Number
NSDA	Negotiated Service Delivery Agreement
OTL	Outreach Team Leader
PHC	Primary Health Care
PN	Professional Nurse
PDOH	Provincial Department of Health
PNC	Post Natal care
TB	Tuberculosis
WBOT	Ward Based Outreach Teams
WHO	World Health Organization

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GLOSSARY

Activities:	The actual events or actions that take place as a part of a program.
Antenatal care Visits:	Visits done by a community health worker to a pregnant woman within the community.
Gestation:	The number of weeks a woman is pregnant.
Household visits:	Visits done by community health workers to members of the community.
Immunization status:	Whether a child has received all the recommended immunizations.
In-service training:	Training provided by outreach team leaders to community health workers.
Inputs:	Resources used to plan and set up a program.
Logic model:	A systematic and visual way to present the perceived relationships among the resources you have to operate the program, the activities you plan to do, and the results you hope to achieve.

Post-natal visits:	Visits done by a community health worker to woman who has delivered a baby.
Outputs:	The direct products of program activities; immediate measures of what the program did.
Outcomes:	The results of program operations or activities; the effects triggered by the program, for example, policy or environmental changes at the state, community, or organizational level. At the individual level, outcomes might include changes in knowledge, skills, and attitudes or changes in behaviors.
Outcome evaluation:	The systematic collection of information to assess the impact of a program, present conclusions about the program's merit or worth, and make recommendations about future program direction or improvement.
Process Evaluation:	The systematic collection of information to document and assess how a program is implemented and operates. This information can help determine whether the program is being

	implemented as designed and can be used to improve the delivery and efficiency of the program.
Program Evaluation:	The systematic collection of information on a program's inputs, activities, and outputs, as well as the program's context and other key characteristics.

CHAPTER ONE: INTRODUCTION

Over the last two to three decades, the South African health system has experienced a high burden of disease due to HIV, AIDS, TB, maternal and child health (1). This has resulted in poor population health outcomes, including high infant, under five and maternal mortality rates (2). One of the challenges faced by the health system is providing access to health services to the people that really need them. Improving accessibility and coverage is vitally important and is one of the ways that the health system can improve population health (3).

Several countries, most notably Brazil have improved population access to health care by focusing on the delivery of primary health care models where healthcare services are provided at a household level by teams of professional and / or less skilled lay workers such as community health workers (4, 5). South Africa has adapted the Brazilian model of improving access to health care through community health workers delivering health services at households. This study evaluates the implementation of the service delivery model in South Africa that entails primary health care outreach teams of community health workers providing services at household level. This chapter outlines the background of the study, provides information on the guidelines from the National Department of Health (NDOH) on implementation of the WBOT program, reviews the literature on delivering primary health care (PHC) services through CHWs, and outlines the aims and objectives of the study.

1.1. Background

In 1978, the Declaration of Alma Ata proposed PHC as an approach to improving population health (6). CHWs have been introduced to the health system as one way of providing healthcare to all by using the PHC approach (6). According to the World Health Organization (WHO) community health workers are members of the communities where they work that are selected and are answerable to their communities for the health activities that they perform, should be supported by the health system but not necessarily a part of its organization, and have shorter training than professional workers (7). CHWs have improved coverage of health services to many people who are unable to access services. Expanding coverage has resulted in greater utilization of health facilities (8,9) and has contributed to improved population health outcomes such as reduced infant and maternal mortality rates as seen in countries such as Brazil, Nepal and Bangladesh (8,10).

Although CHWs have been working in South Africa for many years, they have traditionally not formally part of the health system of the country (11). A health sector reform introduced in 2011 - the reengineering of primary health care - formalizes the role of CHWs in delivering health and social services at community level as part of the PHC approach in the country, and incorporates CHWs into the formal health system through ward based outreach teams (12).

1.1.1. PHC reengineering policy in South Africa

PHC reengineering has been adopted as a priority within the national health policy of South Africa and aims to contribute to improving population health by strengthening and improving accessibility and quality of services at a district level (13,14,15). The three streams of the re-engineering of PHC include the following: (15)

- The development of district clinical specialist teams whose role is to provide clinical governance of district health services, with an initial focus on maternal and child health (MCH).
- The implementation of the school health program
- The implementation of municipal ward based PHC outreach teams comprising of CHWs led by nurse clinicians (outreach team leaders).

According to the policy, each municipal ward should be served by one or more ward-based outreach teams based on the population of the ward.

1.1.2. Ward Based Outreach Teams in South Africa

According to the national guidelines on the implementation of ward based outreach teams (WBOTs) in South Africa, each team should consist of a professional nurse outreach team leader (OTL), six CHWs, as well as a health promoter (HP) and an environmental health officer (EHP) where these exist (16) (Figure 1).

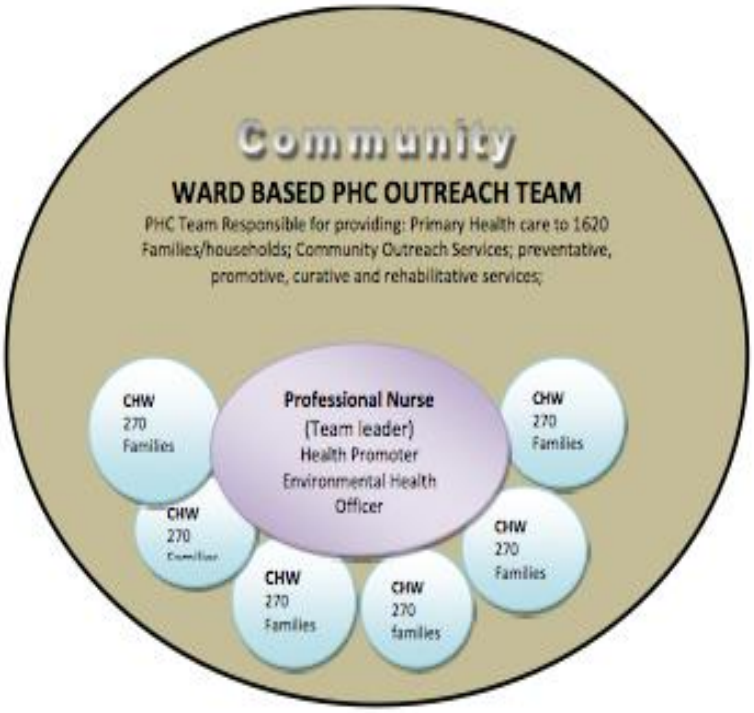


Figure 1: The Ward Based Outreach Team Model (16)

The guidelines define the criteria for selecting CHW into the WBOT program as follows: CHWs that are volunteers doing home based care for a period of at least one year, that work within the community or municipal ward in which they live, and are functionally numerate and literate in English. Functional literacy is defined as a level of reading, writing, and calculation skills sufficient to function in the particular community in which an individual lives (17). Functional literacy includes life skills and knowledge which are necessary to function in society (18).

The NDOH recommends CHWs to have two types of prescribed trainings: a) either the 69 days training program (which is training for 69 days and provides CHWs with basic skills on home based care) or ancillary health care training which is an accredited training program on home base care; and b) the ‘phase

one' training which is a fifteen-day orientation program aimed at preparing home based caregivers to perform their role as CHWs and conduct service provision activities within the WBOT program. The training focuses on MCH, HIV, AIDS, and TB. The NDOH has plans set out to train CHWs in phases and subsequent trainings will be conducted in the future (16). Currently CHWs in the WBOT program are employed by NGOs within the community. These NGOs are contracted by provincial departments of health (PDOH) (19).

According to the national guidelines, each WBOT team should be allocated 1620 households and each CHW 270 households (figure 1). However, various departments of health documents and guidelines state different household allocation per CHW and per team, and a statement by the minister of health in 2011 stated that each CHW should be allocated 250 households (20). However, in 2011 the national implementation toolkit was developed which stated that the household allocation per CHW is 270 households (16). For the purpose of this study the implementation toolkit guidelines are used as the national guideline.

The guidelines state that CHWs should conduct household visits to register all households that have been allocated to them. During these household registration visits, CHWs are expected to identify people at risk and take appropriate steps to link them to care. For example for MCH services, pregnant and postnatal women should be referred to the clinic if needed and have follow up visits from CHWs. Children identified to be unimmunized should be referred to the clinic and have follow-up home visits thereafter by the CHW to ensure that they went to the clinic and got immunized (21).

The role of the team is to provide basic health care services at a household level focusing primarily on disease prevention and health promotion (16). The teams focus on four main areas: MCH, HIV, AIDs and TB, non-communicable disease (NCD) and violence and injuries. These areas have been chosen as the focus of the WBOTs because these areas contribute the most to the burden of disease within the country (1,16). The core service delivery functions of the teams at household level include (16): providing household members with information and education on common diseases and providing psychosocial support such as referral for social grants where needed. CHWs also provide basic treatment for common illnesses such as oral rehydration solution for children with diarrhea (16). It is thought that delivering these PHC services, for example for MCH, will improve access and utilization of antenatal services, and improve immunization coverage, thereby improving health system outcomes such as population health. Indicators such as the first antenatal visit before 20 weeks allows for the early detection of antenatal problems, which if addressed early will improve maternal mortality. Similarly the early detection of perinatal problems will also result in early treatment and thereby reduce perinatal mortality rates. These indicators serve as a indictor of MCH mortality rates, which continue to pose a challenge in South Africa.

Whether the WBOTs are being implemented according to guidelines, and whether the teams contribute to improving service delivery, needs to be determined.

1.2. Problem Statement

Community based outreach services are not unique to South Africa. Their successful implementation in several countries, most notably Brazil, has improved population health outcomes (22,23). In 1990 Brazil had an infant mortality rate of 49.7 per 1000 live births and this rate dropped to 28.9 per 1000 lives birth by 2002 (22). South Africa learned lessons from Brazil and adapted the Brazilian approach to develop a PHC outreach model that could be implemented in the South African health system context where there are a limited number of healthcare workers. While the adapted Brazilian model has been adopted since 2011 in some parts of South Africa, not enough is known about how well the outreach teams are being implemented. For example, since WBOTs were established in 2011 in the Ekurhuleni health district (EHD) a process evaluation has not been done to assess their implementation.

WBOTs have been established in a phased manner in the Ekurhuleni Health District (EHD) since 2011 and have been implemented across three sub-districts within the district: the Northern, Southern, and Eastern sub-districts. Each of these is divided into a number of municipal wards with clear geographical demarcations (24). There are 101 municipal wards in the Ekurhuleni district and district profiling identified the poorest wards within the district. A few of these poor wards were chosen as the initial implementation sites for the WBOT program. Between 2011 and 2015, ninety teams have been implemented partially covering 53 wards in the district with CHWs responsible for approximately 250 households each.

Furthermore research in, Nepal, Bangladesh and Brazil shows that the successes of a CHW program is dependent on several factors including: sufficient resources to support CHW activities, quality training and supervision (8,10). However, other than in routine activity reports these kinds of issues have not been formally evaluated in relation to the performance of WBOTs in the EHD. Evaluation studies to assess whether these enabling factors are in place are lacking but needed. This study is a process evaluation that assesses whether WBOT activities are being implemented as defined in national guidelines, and whether some of the process requirements of a WBOT program described in the literature are in place. At the time of the study, nine teams had been implemented in the district. The study thus focuses on the implementation of the first nine teams in the EHD using MCH as a proxy.

1.3. Justification for the study

WBOTs have been implemented in Ekurhuleni only since 2011, so it is too soon to conduct an impact evaluation to assess outcomes and impacts on population health. Impact evaluations are often done at the end of a program cycle to assess whether program aims have been achieved (25,26). Process evaluations are useful for assessing progress in the interim period and can be used as an ongoing process for quality improvement and to monitor implementation (27). It is hoped that the findings of this process evaluation study will document progress in the implementation of the WBOTs, identify the challenges the WBOTS face, and provide information on the successes and

challenges in the implementation of this new model in the South African health system, which managers can use for program improvement.

1.4. Literature review

1.4.1. CHW programs and activities

CHW programs have originated within communities where community members have assisted people in need of health care. These community members are lay workers that volunteer their services through NGOs and faith based organizations to provide health care (8,9). CHW Programs have since been implemented in many countries in response to health system challenges which have developed as a result of an increase in the burden of disease such as HIV, and AIDS, TB and MCH. There are no standard models for CHW programs and therefore many programs are implemented in different ways across the globe.

CHW Programs have been found to be effective in delivering health services to those in need, such as the program implemented in Bangladesh, which has contributed to reducing the under-five mortality rate by 60 % through preventative services provided by CHWs such as immunization to children and managing illness like diarrhea and neonatal sepsis (10). CHWs provide a range of other services to communities, such as taking care of patients with HIV AIDS, providing adherence support and counseling and providing education to the community on common illness and the prevention of disease

(28). They also assist with detecting ill patients in the community and referring them to the local clinic for further care (16).

Studies conducted on CHW interventions related to MCH describe various services delivered by CHWs within the households. A Study by Oliver et al in Kenya in 2015 describes how CHWs conduct antenatal home visits, by providing education to pregnant woman on antenatal care and referring them to the clinic if they require further assessment (29). CHW activities described by Nair et al (30) and Bang et al (31) on postnatal and newborn care include CHWs educating mothers on breastfeeding and postnatal and newborn care (30,31). Other CHW activities described in the literature include: the referral of unimmunized children by CHWs to health facilities for immunization (32,33) and the treatment and prevention of childhood diseases such as diarrhea and pneumonia (23).

Studies in Kenya and India show that CHW activities have resulted in improved coverage (29,31) and utilization of health services (29) which have resulted in the reduction of infant and maternal mortality (23). In Brazil, success (improvement in health) is also attributed to CHW activities as seen in a study by Aquino et al in 2008 which showed that between 1996 and 2004 there was a statistically significant association between increasing FHS coverage and reductions in infant mortality, and that the effect of the FHS was greater in municipalities with a higher infant mortality rate (23). The FHS activities included the promotion of breast-feeding, prenatal care, under five care and the management of common childhood illnesses.

1.4.2. Community health workers in SA

Home based care was introduced into South Africa as early as the 1940's. Professor Sydney Kark was one of the earliest pioneers of home based care where he provided clinical care in a village in a rural community in Kwazulu Natal. The services he provided went beyond what was typically offered at that time (34). This led to the establishment of community health centers providing an integrated individual based treatment with community health activities (34). The community health center became the basic unit for the delivery of care as recommended by the Gluckman commission and became the model for future community health centers (35).

Since then CHWs have been involved in the delivery PHC services in South Arica for decades, largely through non-governmental organizations (NGOs) (19,36). Various CHW programs have been implemented in South Africa over the years focusing primarily on home based care of HIV and AIDS patients (37) These programs however have not always been linked to services within the broader health system. The vision of the new WBOTs model is that CHWs should be an integral part of the health services. The NDOH expects that this is the model on which all public sector funded CHW programs should be based.

In provinces such as the North West Province WBOTs have been implemented since 2011 with both private and public sector funding (38). In Gauteng province different models of CHW programs have been implemented. For example in Sedibeng and Tshwane districts, the

implementation of the WBOTs have been rolled out through health posts which are physical structures in which a dedicated nurse provides basic care for community members. These structures provide a base for CHWs to meet and from there provide outreach services, and provide relatively easy access for the community to access services (39,40). In other settings WBOTs are linked to formal clinics (16). An evaluation of the implementation of various WBOT program models against the national guidelines has not been formally done in a research study. Most available research are descriptive studies describing WBOT implementation and challenges (38,39), assessment reports (40) and conference presentations describing WBOTs activities (41). The gap in the literature that exists is the limited formal evaluation of implementation of the WBOT program.

South Africa has based the WBOT model on the model used in Brazil. The introduction of the Family Health Program (FHP) in 1994 in Brazil now referred to as the Family health Strategy (FHS) (42) initially consisted of teams composed of a doctor, a nurse, and four to six CHWs. The teams have now expanded over time to include other health workers such as dentists, social workers, and psychologists. Each team enrolls 2400-4000 people in a given area to provide primary care services such as immunizations, treatment of common illness, health education and antenatal and postnatal care at household level (5,43). The composition of the South African WBOTs differs to the FHS in that it does not include a doctor in the team but rather a nurse who leads the team. The contribution of nurse led teams to population health in South Africa has not yet been documented since the WBOTs are a new program. Experiences from studies in the United States of America show that

nurse led teams of CHWs can improve referral linkages to health services and reach communities in need of services by conducting home visits (44,45).

1.4.3. Factors contributing to success of CHW programs

The success of CHW programs can be attributed to a number of factors described in the literature. Programs have been successful when CHWs have been equipped with the necessary resources to conduct activities within the household, have regular training courses (46), and are monitored regularly by supervisors conducting meetings to check their activities (47,48). As seen in countries such as Rwanda, Afghanistan, Nigeria, India and Nepal regular supervision by program supervisors conducting visits to check CHW activities and support with refresher training courses attributed to their success (47,49). Clinical support provided by other members of the team can also assist CHWs. In Brazil CHWs are supported by the other members of the FHS team that they work closely with, who advise them on patient care (5). Other important aspects of a successful CHW program documented in the literature include: government support through supplying resources for activities and through the remuneration of CHWs such as that seen in Brazil (42). Having resources available to do visits has resulted in successful implementation of CHW programs (10,46) and therefore, emphasis must be placed on resource availability.

1.4.4. Challenges of implementing CHW programs

Although CHW programs have shown great success, many countries continue to struggle in implementing them and therefore fail to see improvements in health outcomes despite having CHW programs in place. For example, challenges faced by the FHS in Brazil include: lack of human resources, variations in the type of team members and limited availability of resources (42). Similar challenges have been identified in other CHW programs, which include difficulties with logistics and supply chain resulting in a lack of medical equipment and supplies for patient examination (29). In Kenya a study found that a lack of drugs prevented CHWs from providing clients with the required treatment (29).

Poor referral mechanisms are another challenge. CHWs often refer clients to the clinic if they are unable to treat them in the household and in so doing provide a link to health facilities (50). Ineffective links and referral systems have contributed to the poor integration of CHW teams into the broader health system (50). For example in South Africa in 2005 a study showed that CHWs referred patients to the clinic, but did not receive feedback from the clinic, because the clinic staff were unaware of who the CHWs were and what role they played at the clinic (51). The establishment of links between the community and primary care facilities is therefore important. Other challenges experienced include poor supervision of CHWs and poor support from management. A process evaluation study conducted by Kim et al in Ethiopia reported that: only between 21.8% and 41.8% of CHWs received supervision visits during the last one month; supervision consisted mainly of supervisors

providing information about the program rather than checking CHW activities; and CHWs did not receive feedback on their activities and more importantly on how to improve from mistakes which were made (52). That process evaluation study highlighted the need to strengthen the relationship between CHWs and their supervisors.

1.4.5. Process evaluations

Process evaluation focuses on how a program operates and is also known as implementation evaluation (24). Processes evaluations can be done to improve the quality of a program and provide a better understanding of how well the program interventions are working (53). Most process evaluations measure different aspects of program implementation, informed by a framework. The logic model is a commonly used framework that defines the aspects of a program in terms of its inputs, processes, outputs, and outcomes (short-term, intermediate, and long-term) (figure 2) (53).

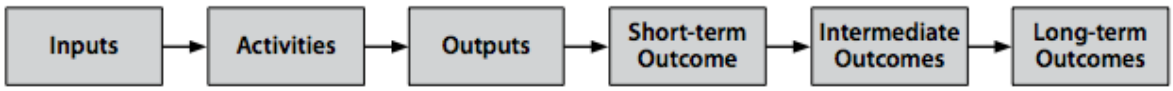


Figure 2: The Logit Model

Process evaluation focuses on the first three steps of the logic model (inputs, activities, outputs). Inputs refer to the various resources that go into a program, processes are the actual activities that are implemented as part of a program and outputs are the direct products of a program's activities (53). A

process evaluation allows one to assess a program's activities and to link progress on these activities to outputs and outcomes. Process evaluations provide information, which can be used for program improvement. For example, a process evaluation can indicate whether staffing for a program is sufficient (inputs) and whether activities being undertaken are appropriate (processes) or whether services are achieving sufficient coverage (outputs) (53).

Process evaluation can be used to evaluate CHW programs. For example a study in Kenya in 2014 compared the difference in program implementation between two CHW programs using an evaluation conceptual framework to assess: inputs (CHW recruitment, remuneration, training); processes: (service delivery, management support and supervision) and outputs (household coverage) (54). The study found that factors that hampered program implementation in both programs evaluated included: a lack of resources such as transport to conduct home visits (inputs), insufficient supervision from supervisors (processes) and inadequate coverage of households by CHWs (outputs) (54).

1.5. Aim and objectives of the study

This study focuses only on the MCH component of the WBOT program. MCH was chosen because of its contribution to the burden of disease within South Africa (1, 2). A few of the indicators set by the department of health for assessing the burden of maternal and child health include: the maternal,

perinatal and under five mortality rate, the first antenatal clinic visit, the incidence of childhood diarrhea and the immunization coverage. These indicators indicate that the country continues to face challenges in addressing maternal and child health. Since WBOTs are a new program, maternal and child health outcomes such as mortality rates cannot be assessed however, the health outcomes such as the first antenatal visit, the incidence of diarrhea and the immunization coverage can be addressed by the activities provided by the WBOT.

The primary aim (aim 1) is a process evaluation of the WBOT program assessing inputs, processes, and outputs.

1.5.1. Aim 1

To evaluate implementation of ward based outreach teams in the Ekurhuleni Health District.

Specific objectives for Aim 1

Inputs

1.1. To describe whether the composition of teams and characteristics of team members are in accordance with national guidelines.
1.2. To describe training of community health workers and OTLs, and availability of resources that CHWs require for providing MCH services at household level.

1.3. To describe CHW knowledge on activities for delivering MCH services at household level.

Processes

1.4. To describe whether WBOTs provide MCH services at a household level in accordance with guidelines (including referral and follow up of maternal and child health clients).
1.5. To describe the availability and nature of referral linkages between ward based outreach teams and clinic facilities.
1.6. To describe whether ward based outreach teams receive support and supervision in the delivery of MCH services.

Outputs

1.7. To determine the proportion of expected follow up home visits for antenatal and postnatal women that is conducted.
1.8. To determine the proportion of identified unimmunized children under five that are appropriately referred and followed up by CHWs.

1.5.2. Aim 2

The guidelines set out by the department of health for WBOT provides information on the activities to be conducted by WBOTs. WBOTs do many activities; however all their activities related to MCH consists of them doing

follow up visits according to the guidelines. These visits are documented in their client records but what they do at the home during the visit is not well documented. So, it is not possible to measure through a record review what they did at the home visit, but it is possible to measure whether they did the required visits.

Therefore the secondary aim of the study is to assess for an association between CHW characteristics and their adherence to national guidelines regarding follow up visits to antenatal and post-natal woman.

In summary, this chapter has provided the context and background for this research as well as a literature review. The arrangement of subsequent chapters is as follows: chapter two outlines the research methods that were used to conduct the study, including the study design, study setting, data collection methods and analysis. In chapter, three the findings of the study are presented while chapter four is a discussion chapter, which interprets the findings in the context of the literature, highlights public health implications of the findings, and discusses the study limitations. Finally, chapter five provides the conclusion and relevant recommendations for public health policy and practice.

CHAPTER TWO: Methodology

This chapter provides the methods that were used to conduct the study. It provides a description of the study setting, design, study population, and sampling. It also describes the data collection methods and data analysis techniques applied.

2.1. Study design

This is a cross-sectional study, which includes a self-administered questionnaire survey, key informant interviews, and a retrospective record review. The study takes the form of a process evaluation, which assessed implementation of the WBOTs program in the EHD in terms of its inputs, processes, and outputs. The study was conducted between January and December 2013 and reviewed program activities for the period January 2013 to December 2013.

2.2. Study setting.

At the time of the study nine WBOTs had been established, each linked to a PHC clinic facility. The nine WBOTs were linked to six clinic facilities – some clinics were linked to more than one WBOT (Table 1). For the purpose of this study, the WBOTs are named as WBOT 1 to WBOT 9.

Table 1: Ward Based Outreach Teams implemented in the Ekurhuleni Health District in 2013

Ekurhuleni sub district	Clinic	Number of WBOTs
North	Clinic A	WBOT 1
	Clinic B	WBOT 2 and 3
East	Clinic C	WBOT 4
	Clinic D	WBOT 5 and 6
South	Clinic E	WBOT 7
	Clinic F	WBOT 8 and 9

In the EHD, each WBOT comprises CHWs led by an OTL who is based at the local clinic and reports to the clinic facility manager. According to WBOT implementation guidelines (16,21) regarding MCH services, CHWs are expected to, at the first registration visit, identify all antenatal, postnatal women and children under the age of five in each household. For each identified antenatal woman a CHW is expected to conduct up to a total of four follow up home visits before 32 weeks gestational age (number of visits depends on gestational age at registration), and for each postnatal woman up to four postnatal visits in the first 14 days after delivery (Table 2).

CHWs are also required to identify and refer to the local clinic any pregnant woman who has not attended the antenatal clinic; refer children under five who are not immunized; and conduct a follow-up home visit two weeks later to check that the referred child attended the clinic (21). CHWs are required to report to the clinic daily before and after conducting household visits. They

have kitbags, which they collect from the clinic daily. These kitbags store the supplies the CHWs need to conduct activities within the households.

Table 2: Antenatal and Postnatal home visit schedule

Visit	Timing of visit
Antenatal home visits	
Visit 1	Conception-14 weeks
Visit 2	14-24 weeks
Visit 3	24-28 weeks
Visit 4	28-32 weeks
Postnatal home visits	
Visit 1	24 hours after delivery
Visit 2	Day 3
Visit 3	Day 7
Visit 4	Day 14

CHWs have been given forms to document household registration visits, referrals done, and follow-up home visits conducted. Information collected at the registration visit is recorded onto a household registration form, which CHWs submit to the clinic to be captured electronically. This form has provision to capture each household member, their contact details, and other information such as whether anyone in the household receives a social grant, and whether the home has water and sanitation facilities. This form also captures data on which household members are ill, and whether anyone is on medication. Information on subsequent home visits is captured on the maternal and child health form. This is a single form, which is used by CHWs

for antenatal women, postnatal women, and children under five years. A form is completed for each individual client. This MCH health form contains demographic information, gestational age, date of birth, date of follow up visits, whether and when referred to the clinic, and the outcome of the referral. Information on referrals such as the date the CHW referred the client to the clinic and the reason for the referral is documented on a referral form by CHWs when referring a client to a clinic. CHWs also record information on which clients they referred and who they need to follow up in diaries and referral books. CHWs are required to submit data reports monthly both to the OTL at the clinic and the NGO.

2.3. Study population and sampling

For the self-administered questionnaires, the study population included all CHWs in a WBOT in the EHD during November and December 2013. For the semi-structured interviews, the study population included all OTLs of a WBOT, all facility managers (FM) of clinics linked to a WBOT and all managers of NGOs contracted to support WBOTs in the EHD. No sampling was done; all CHWs were approached to participate within the study voluntarily, during their monthly team meetings and OTLs, facility managers and NGO managers were approached individually to participate within the study. All nine WBOTs, 79 CHWs, eight OTLs, six facility managers of the six clinics linked to the nine WBOTs and six NGO managers supporting the WBOT program in the EHD voluntarily agreed to be included in the study.

For the record review, the study units and sample included:

- The MCH forms of all antenatal women and postnatal women that were first registered by a CHW during January to June 2013 and all entries on follow-up visits in these forms for a period of six months after registration.
- The MCH forms of all children under-five years first registered by a CHW during January to June 2013 and all entries on follow-up visits in these forms for a period of six months after registration.

2.4. Data collection

Data was collected during November and December 2013. Primary data were collected using various methods, including:

- A self-administered questionnaire to collect data from individual CHWs on their characteristics (age, gender, educational level, knowledge and perceptions regarding their support and supervision) (Appendix B).
- Key informant interviews using semi structured questionnaires administered through face to face interviews with OTLs, including closed and open ended questions, to collect data on OTLs' characteristics (age, gender, OTL experience), and their perspectives on WBOT activities, challenges faced in delivering WBOT services, support and supervision, and resources. (Appendix C).
- Key informant interviews using semi structured questionnaires administered through face to face interviews with facility managers and NGO managers, including open ended and closed questions, to

describe their roles, experiences, and challenges with implementing WBOTs (Appendix D).

- An audit of the supplies in the CHWs kit bags was conducted using a checklist (Appendix E).

All interviews with OTLs, facility managers and NGO managers were conducted at the clinic facility in English and lasted on average for about one hour. All participants that were interviewed were approached individually when asked to take part in the study.

Secondary data sources included the following:

- Three data extraction tools were developed and used to extract existing data from individual MCH forms for antenatal woman (Appendix F), postnatal women (Appendix G) and children under five (Appendix H) on the number and dates of referral and follow up visits conducted for each client during the six month period following the first registration visit.
- The extraction tools were also used to extract data from the following additional sources of information on referrals and follow up visits if the required data were not available in the above MCH forms:
    - CHW diaries: data were extracted on the date of referral of children under five, and the outcome of the referral. Whether they went to the clinic and if they were immunized as well as on the date of the follow up visits for maternal clients.

- Referral books: data were extracted on the date; unimmunized children were referred to the clinic and whether they went to the clinic.
- Referral forms: data were extracted on the date of referral of children under five referred to the clinic for immunization and whether they had immunizations done.

Self-administered questionnaires to the CHWs were all conducted on one day. The audit of the kitbags was done at the same time as the self-administered questionnaires. The secondary data were extracted from the MCH forms, which were kept in files at the clinic facility to which the WBOTs are linked.

2.5. Measurement

The framework in Figure 4 depicts the inputs, processes, and outputs that were measured in the process evaluation (aim 1). The variables that were measured for Aim 1 are described in Tables 3 to 5.

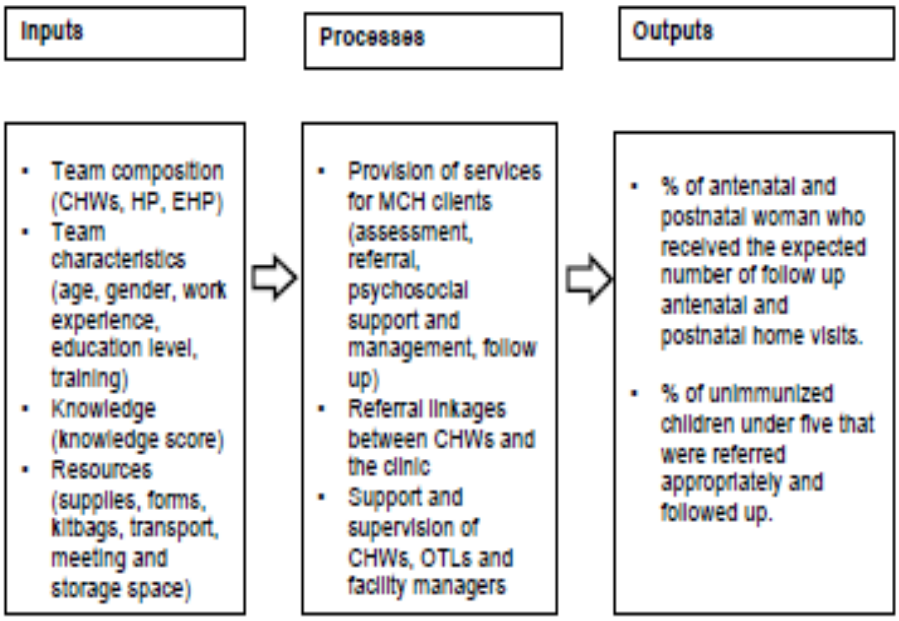


Figure 3: Framework for the process evaluation

2.5.1. Measuring inputs

The variables used to measure inputs are shown in Table 3. Team composition and some CHW characteristics (such as CHW and OTL work experience and training) are defined in the national guidelines. CHW recommended training refers to the training prescribed by the NDOH (attendance of 69 days home based care training or ancillary healthcare training, and phase one training). Data were also collected to describe any other additional training a CHW had attended.

CHW knowledge was measured by asking them questions on activities for providing MCH services. The questions were based on what CHWs are expected to know according to their training manual. Three knowledge scores were then developed and used to measure CHW knowledge about providing

services to: a) antenatal women (score out of six), b) postnatal women (score out of three) and b) children (score out of six)

The availability of resources for service delivery at the household was measured by checking whether the required resources (as defined in the national guidelines) were available for CHWs and WBOTs. The supplies for providing MCH services that CHWs were supposed to have in their kitbags include: referral forms, MCH forms, an activity checklist, a disposable thermometer, a pregnancy wheel and a mid-upper arm circumference tape measure.

Table 3: Input Measures

Objectives	Variables that were measured to describe inputs	Data source
1.1. To describe whether the composition of teams and characteristics of team members are in accordance with national guidelines.	**Characteristics of CHWs** • Age, gender • Ward where s/he lives, ward where s/he works • Level of education • Previous work experience as a CHW (type and duration)	Questionnaires to CHWs
	Characteristics of OTL • Age, gender • Level of education • Whether has had OTL training (type and duration of training) • Post graduate training • Work experience as professional nurse (type and duration)	Semi structured interviews with OTLs
	Composition of WBOTs • No. Of CHWs allocated to the WBOT • No. And designation of any other cadres of health workers included in the WBOT • Whether the WBOT has an OTL	
1.2. To describe training of community health workers and OTLs, and availability of resources that CHWs require for providing MCH services at household level	**Training** • Training (whether CHW has had attended recommended NDOH training (69 days training or ancillary health training and phase one orientation training) • Whether CHW has had any other relevant CHW training (type and duration of training)	Questionnaires to CHWs
	Availability of resources in CHW Kit Bags • Availability of: CHW checklist for activities that need to be done, maternal and child health forms, referral forms, pregnancy wheel, mid upper arm circumference tape, disposable thermometer and cotton balls	Checklist
	OTL, FM and NGO manager views on availability of resources and challenges • **Forms and other supplies:** who supplies the resources**,** whether forms for referring clients and other supplies such as maternal and child health forms, referral forms, pregnancy wheel, mid upper arm circumference tape, disposable thermometer and cotton ball were available and whether any out of stock in the last three months, Provision of name badges and uniforms for CHWs • **Space:** for WBOT members to meet at the clinic and to store kitbags **Transport:** availability of dedicated transport to conduct home visits.	Semi structured interview with OTLs, FMs, and NGO managers.
1.3. To describe CHW knowledge on activities for delivering MCH services at household level	**Knowledge** • CHW knowledge on providing MCH services at households.	Questionnaires to CHWs

2.5.2. Measuring processes

The processes measured are described in Table 4. Activities done at the household for MCH clients were assessed in four main areas as defined by the guidelines i.e. assessment and referral, information and support, psychosocial support and management of common illness. Activities for antenatal and postnatal home visits and referral and follow up of unimmunized children under five were also measured against national guidelines and the CHW training manual. Other aspects of the program (support, supervision, and referral linkages) were inferred from the literature (8,10,50)

Table 4: Process Measures

Objectives	Variables that were measured to describe processes	Data source
1.4. To describe whether WBOTs provide MCH services at a household level in accordance with guidelines (including referral and follow up of maternal and child health clients)	**Services delivered by CHW in the households** • Whether and what types of activities they did for assessment and referral, information and support, psychosocial support, management of common illness • Challenges with providing services. • Referrals of unimmunized children under five. (Date and number of referrals) • Follow up of unimmunized children referred. (Date and number of referred unimmunized children followed up after referral) • Follow up of antenatal and postnatal woman (dates and number of follow up visits)	Semi structured interview with OTLs MCH forms Referral books Diaries
	OTL and FM role, experiences and challenges with provision of MCH services through WBOTs	
1.5. To describe the availability and nature of referral linkages between ward based outreach teams and clinic facilities.	• **Whether and how CHW refer clients to the clinic**: How this is done, what is the process of referral • **How referrals are managed at the clinic**: What happens to clients referred to the clinic by CHWs, how is the referral process done. • **OTL and FM experience and challenges:** How does the OTL manage referred clients, the role of the facility manager in dealing with referral.	Semi structured interview with OTLs, FMs.
1.6. To describe whether ward based outreach teams receive support and supervision in the delivery of MCH services.	**Support and supervision of CHW** • CHWs perceptions of and satisfaction with supervision provided to them by OTLs, CHW perceptions measured using a four point Likert scale ranging from strongly agree to strongly disagree • OTL's experience and challenges with giving supervision to CHWs, and the nature of supervision provided (supervised home visits, feedback meetings with CHWs, providing in service training, checking CHW forms) **Support and supervision of OTL** • OTLs' experiences and perceptions regarding support and supervision they receive (what type of supervision, from whom). **Support and supervision for FMs** • FMs' experiences and challenges with giving (to OTLs and WBOTs) and receiving support and supervision	Questionnaires to CHWs. Semi structured interview with OTLs Semi structured interview with FMs

2.5.3. Measuring outputs

The outputs that were measured include the proportion antenatal and postnatal follow up visits done by CHWs that were in accordance with the guidelines, and the proportion of unimmunized children under five appropriately referred to the clinic by a CHW for immunization and followed up after two weeks in accordance with the guidelines. Not all CHWs would see pregnant women within their area; therefore only CHWs that saw a pregnant or postnatal women were included in the measurement on outputs. Below is an explanation of the outputs measured (Table 5).

The proportion of expected maternal follow up visits that were done

In order to measure the proportion of antenatal and postnatal visits done according to guidelines, the expected number of visits that should be done by a CHW (based on the schedule of visits in the guidelines) was first determined, and then the number of visits done was determined. The proportion was measured by dividing the visits done by the visits expected and multiplying it by 100.

The first time the CHW saw an antenatal or postnatal woman, was during the household registration visits. The date of the household registration was taken into account when calculating the expected number of visits e.g. if a CHW saw a pregnant woman for the first time at 30 weeks, the expected number of antenatal visits would be one. This is because the CHW registered this woman between 28 and 32 weeks gestation when the last antenatal visit should be done according to the guidelines. If the CHW registered the woman

when she was 13 weeks pregnant, the expected number of visits would be four. The same was applied for postnatal women. The total number of expected antenatal visits and expected postnatal visits were combined to give a total number of expected maternal visits for each CHW.

The actual number of visits done per CHW out of the expected visits for antenatal and postnatal woman was then calculated. For example if a CHW registered a pregnant woman at 13 weeks gestation she was expected to perform four home visits within 32 weeks. If she only did two visits then the visits done was two. The total number of visits done by CHWs per antenatal and postnatal woman was added to give the total number of visits done.

Appropriate referral and follow up of unimmunized children under five

The referral and follow up of unimmunized children under five were measured by clinic site and not by WBOT team or individual CHWs because data were collected for this measurement by site and could not be linked to an individual CHW or team. All children under five that were identified by a CHW as not immunized needed to be referred. Appropriate referrals were measured as: the proportion of unimmunized children who were referred to the clinic by the CHW for immunization. Appropriateness of follow up for referred children was also measured. CHWs that refer children to the clinic for immunization need to go back to the household after two weeks to follow up and check whether the child went to the clinic for the immunization. Appropriate follow up of referred children was measured as: the proportion of referred unimmunized children under five that had a home visit by a CHW two weeks after referral.

Table 5: Output Measures

Objectives	Variables that were measured to describe outputs	Data source
1.7. To determine the proportion of follow up home visits for antenatal and postnatal women conducted according to national guidelines	**Antenatal and postnatal woman** • The number of antenatal clients registered before 32 weeks gestational age and postnatal clients before 14 days postnatal • The number of expected follow up antenatal and post natal client visits each CHW is supposed to conduct • The number of follow-up visits (antenatal and post natal) that were done / the number missed • Proportion of expected antenatal and postnatal visits that were done / missed	Maternal and child health forms
1.8. To determine the proportion of unimmunized children under five identified and appropriately referred and followed up by a CHW	**Children under five** • The total number of children under five registered by a CHW. • The total number of unimmunized children identified by a CHW • The number of unimmunized children referred • The number of children referred that were followed up (dates of follow up visits – whether less than or more than two week after referral) • Number of referred children who's had their subsequent immunization documented in the MCH form.	Data extraction sheets of unimmunized children under five

2.5.4. Measuring associations between CHW characteristics and adherence to follow-up visits

The dependent variable was defined as the proportion of expected antenatal and postnatal visits that were missed (visits missed). Visits missed were used as the dependent variable rather than ‘visits done’ because visits missed is a rare outcome. An odds ratio can be used to assess for predictors for a rare outcome (55). Missing a required visit was a rare outcome in this study.

To determine the missed visits the total expected visits were subtracted from the total visits done to arrive at the total antenatal and postnatal missed visits. The proportion of expected visits that were missed (proportion of missed visits) was then measured as follows:

$$\frac{\text{Total No. of expected AN and PN visits missed}}{\text{Total AN and PN visits expected to do}} \times 100$$

The independent variables are as follows: CHW characteristics age, educational level, duration of prior CHW experience, attendance of recommended NDOH training, knowledge score, works in the ward where s/he lives. Because the sample size of CHWs were small (69) only six dependent variables were included in the analysis (55). These variables (educational level (used as a proxy for literacy and numeracy), duration of prior CHW experience, whether works in the ward where lives, whether

attended recommended CHW training) were chosen because they are the recommended minimum requirements for CHWs to be considered into the WBOT program (based on the WBOT toolkit). CHW knowledge score was also included as a dependent variable. It is not a minimum requirement for selection into the WBOT program but is included in the analysis because the knowledge score developed is based on questions that CHWs were trained on and would give a reflection on how much knowledge the CHWs have from their training to conduct the household activities.

2.6. Data management and analysis

Open ended questions that were collected through key informant interviews were asked based on themes that were pre-determined, and typed into Microsoft Word 2010. The analysis was guided by these thematic areas of interest and were from the perspective of the researcher.

The pre-defined themes related to issues highlighted in the framework - inputs (resources) and processes (service delivery, support and supervision, referral linkages). Quantitative data were coded and entered into two databases in Microsoft Excel 2010, one for data on individual CHWs and the other for data on the WBOTs. The data were cleaned by checking for any errors and missing data in the dataset. This was done by filtering and sorting each variable column checking for errors and missing data. All errors and missing data elements were cross-checked with the original data collection tool and corrected accordingly. The data was then imported into STATA 13 for analysis.

2.6.1. Analysis for aim 1

Descriptive statistics were used to summarize quantitative data. Proportions were calculated for categorical variables and medians and inter-quartile ranges for continuous numerical variables where data were skewed.

Input measures

The analysis for inputs describes team composition and characteristics and adherence of these to the guidelines by using proportions for categorical data and medians and inter-quartile ranges for continuous variable (Table 6).

Process measures

Processes measures are analyzed using thematic analysis using pre-defined themes to describe: whether required service were provided (service delivery activities of WBOTs as defined in guidelines, the role and experiences of the OTL and the facility manager in service provision); whether and how referral linkages between the community and the clinic facility were in place; whether and how support and supervision were provided (to CHWs from the OTL, as well as to the OTL from FMs and to the FM) and experiences and CHW perceptions of their supervision (using a Likert scale) (Table 7).

Table 6: Data analysis for input measures

Objectives	Analysis
1.1. To describe the composition of teams and characteristics of team members and determine adherence to national guidelines	**Characteristics of CHWs** • Proportions for categorical variables (gender, works in ward where lives, education level) • Median and interquartile range for duration of previous CHW work experience (in months), age in years **Characteristics of OTL** • Proportions for categorical variables (gender, level if education); Median and interquartile range for numerical variables (duration of previous work experience and of OTL experience). **Adherence of CHW characteristics and WBOT composition to national guidelines** *WBOT characteristics* • No. Of teams with: the recommended number of households per team; the recommended number of CHWs per team; recommended number of households per CHW; an OTL; a (PHC-) trained OTL; an EHP and a HP. *CHW characteristics* • Proportions of CHWs that: work in the ward they live; are functionally literate (with primary school education or higher); have received the requisite training (69 days or ancillary health care training plus phase 1 training); Median and interquartile range for numerical variable (duration of training in months), have at least one year of previous CHW experience, age in years
1.2. To describe training of community health workers and OTLs, and availability of resources that CHWs require for providing MCH services at household level	**Training** • Proportions for types of CHW and OTL training **Availability of resources** • Proportion of CHW that had the required supplies (referral forms, MCH forms, pregnancy wheel, disposal thermometer, MAUC tape, cotton balls in their kitbags on day of assessment • No. Of WBOTs that had supplies from their kitbags out of stock in the preceding three months • No. Of WBOTs that had space to meet at the clinic • No. Of WBOTs that had dedicated transport for home visits. **Source of supplies and challenges with providing resources** • No. Of WBOTs who received supplies from the clinic; • No of NGOs who supplied name badges, uniforms, and stipends to CHWs Thematic analysis of pre defined themes to describe challenges with resources
1.3. To describe CHW knowledge on activities for delivering MCH services at household level	**CHW Knowledge** • Knowledge scores were calculated for: ANC knowledge (out of 6); PNC knowledge (out of 3); and under five care knowledge (out of 6). • Median and interquartile ranges were calculated to summarize the scores.

Table 7: Data analysis for process measures

Objectives	Analysis
1.4. To describe whether WBOTs provide MCH services at a household level in accordance with guidelines (including referral and follow up of maternal and child health clients)	**Services delivered by CHWs in the households** • Thematic analysis to describe whether and how WBOTs provide required services: screening, assessment and referral, information and support, psychological services and management of common illness. • No. Of households registered; • *Child health activities performed by teams*: No of children under five registered; No. Of unimmunized children under five identified; No. Of unimmunized children under five referred to the clinic; No. Of children under five followed up within two weeks and within six months but after 2 weeks of referral • *Maternal health activities performed by CHWs* No. Of CHWs that registered any pregnant women and / or postnatal women during period of study; No of pregnant women and postnatal women registered; No. Of pregnant women less than 32 weeks gestational age registered by a CHW; No. Of antenatal visits done; No. Of postnatal visits done. **WBOT challenges with service delivery.** • Thematic analysis to describe the roles and experiences of OTLs, FMs and NGOs in providing services, and challenges WBOTs face in delivering MCH services
1.5. To describe the availability and nature of referral linkages between ward based outreach teams and clinic facilities.	• Thematic analysis to describe referral linkages between WBOTs and clinics, referral mechanisms that are used, challenges WBOTs face with referring clients to clinics, how challenges are addressed and OTL and FM's perceived value of referring patients to the clinic.
1.6. To describe whether ward based outreach teams receive support and supervision in the delivery of MCH services.	**Support and supervision of CHW** • Proportions of CHW with positive (agree and strongly agree with statement) / negative (disagree and strongly disagree with statement) perceptions of support and supervision they receive. **Support and supervision of OTL** • Thematic analysis to describe OTLs' experiences, perceptions and challenges with receiving support and supervision; and the nature of support and supervision provided by OL to WBOTs. **Support and supervision of FMs** • Thematic analysis to describe FMs experiences, and challenges with receiving support and supervision and giving supervision to OTLs and WBOTs.

Output measures

Output measures were analyzed using proportions – to describe the proportion of expected antenatal and postnatal visits (according to the guidelines) that were done and the proportion of referred unimmunized children under five years that were adequately followed up. Table 8 describes the analysis that was done.

Table 8: Data analysis for output measures

Objectives	Analysis
1.7.To determine the proportion of follow up home visits for antenatal and postnatal women conducted according to national guidelines	• Proportion of expected (according to guidelines) antenatal and postnatal follow up visits that were done • Proportion of expected (according to guidelines) antenatal visits that were missed • Proportion of CHWs that performed the expected number of antenatal and postnatal follow-up visits
1.8.To determine the proportion of unimmunized children under five identified and appropriately referred and followed up by a CHW	• Proportion of identified unimmunized children under five that were referred by the CHW to the clinic. • Proportion of unimmunized referred children under five who were appropriately followed up (within two weeks of referral according to guidelines) • Proportion of referred unimmunized children with a documented immunization status subsequent to referral to clinic.

2.6.2. Analysis for aim two

Bivariate and multivariate analyses were performed to evaluate for associations between CHW characteristics and the dependent variable (which denotes extent of adherence to guidelines). Table 9 shows the definitions of independent and dependent variables used in the analysis.

Table 9: Definition of variables for aim two

Aim	Analysis
To assess for an association between CHW characteristics and their adherence to national guidelines regarding follow up visits to antenatal and post-natal woman.	**Independent variables** • Age was categorized as: 1-29 years; 30-39 years; 40-49 years; 49+ years • Gender (male, female) • Educational level (<Matric (grades 1-11), ≥ Matric (Matric plus any qualification obtained after Matric) • Duration of prior CHW experience (in months) was categorized as: 0; 1-24; 24-48; 49+ • Attendance of NDOH-recommended training (yes; no) • Knowledge score (continuous) • Works in ward where lives (yes, no) **Dependent variable** • Proportion of missed visits

Bivariate analysis was done using the Rao Scott correction for the chi-square test (56). A chi square test could not be done in this analysis because the expected visits done were added together amongst all the CHWs, so the analysis was not done on the % of CHWs who did the expected visits, but the % of expected visits that were done. This caused the clustering of visits

amongst the CHWs, therefore the visits could not be analyzed per individual CHW. As a result the Rao Scott correction of the Chi square test was used to account for the visits being added together amongst the CHWs (56). All variables with a significance level of < 0.1 on bivariate analysis (education and attendance of recommended CHW training) were included in the multivariate analysis, as well as age which was a potential confounder.

Logistic regression was then performed. First, univariate analysis was performed so the independent variables were examined individually by comparing the proportion of missed visits between older and younger CHWs (age), more and less educated CHWs (education level) and those who attended recommended CHW training and those who did not. Crude odds ratios and 95 % confidence intervals were computed. Multivariate analysis was performed to calculate adjusted odds ratio and 95% confidence intervals.

2.7. Ethical considerations

Permission to conduct the study was obtained from the District Research Committee in Ekurhuleni. Ethics approval was obtained from the Human Research Ethics Committee of the University of the Witwatersrand (Appendix I). Written informed consent was obtained from all the study participants after all participants were individually provided with information sheets. To ensure confidentiality, no names were indicated on the questionnaires, only codes. However, since the study required data from CHW questionnaires to be linked to team data from OTL interviews and to the secondary data, some identifier data were obtained from the individual CHWs as follows. On the day of

administering the questionnaires, each CHW was asked to indicate their name, age, team number, and ward where they worked on a register against a pre-listed code. This code was used to link the individual CHW with a corresponding code to their team. In addition, this code was indicated on the data extraction sheet to link the CHW to the secondary data collected. The codes were kept under lock and key and accessible only to the researcher.

CHAPTER THREE: RESULTS

The results for this study are presented according to the inputs, processes and outputs for aim one followed by the results for aim two.

3.1. Inputs for implementing WBOTs services

3.1.1. Team composition and characteristics

Community health worker characteristics

The characteristics of the 79 CHWs included in the study are shown in Table 10. The median age for CHWs was 35 years (IQR: 30-41); the majority were female (92%), and 81 % had at least one-year prior experience as a CHW. Many (86%) had completed two or more additional trainings which were provided either by the NDOH or by an NGO. Amongst the NDOH-recommended trainings the 69 days training was attended by 53% of CHWs, ancillary health care training by 38%, and phase one orientation training by 97%. CHWs had a median knowledge score of 6 (IQR 5-7) out of 15.

Table 10: Community health worker characteristics

Characteristic	Results (N=79)
Age (years) *Median (IQR)*	35 (30-41)
Sex *No. (%)*	
Female	75 (92)
Male	4 (8)
Works in the same Ward in which resides *No. (%)*	51 (64)
Education *No. (%)*	
No education	2 (3)
Primary (grade 1-7)	0 (0)
Secondary (grade 8-11)	42 (53)
Matric (grade 12)	21 (27)
Tertiary	14 (17)
CHW training completed *No. (%)*	
NDOH 69 days training	42 (53)
NDOH Ancillary health care	30 (38)
NDOH Phase 1 orientation training	77 (97)
Any other training	68 (86)
HIV, AIDS, HBC, counselling	44 (55)
First aid	11 (13)
Computer training	22 (27)
Any training specific to PHC	30 (38)
Previous CHW work experience	
Some prior CHW-related work experience *No. (%)*	69 (87)
≥ 1 year CHW experience *No. (%)*	64 (81)
Duration of prior CHW experience (months) *Median (IQR)*	45 (24-78)
Knowledge on providing antenatal, postnatal and child health services	
Knowledge score *Median (IQR)*	
Antenatal score (out of a possible score of 6)	1 (0-1)
Postnatal score (out of a possible score of 3)	0 (0-1)
Child health score (out of a possible score of 6)	5 (4-6)
Total score (out of a possible score of 15)	6 (5-7)

Outreach team leader characteristics

OTL characteristics are presented in Table 11. All eight OTLs were female and their median age was 39 years (IQR: 26-60). All had received an undergraduate nursing qualification; and three had received postgraduate training (diploma in primary health care nursing). Six of the eight OTLs received OTL training, for the WBOT program which is provided by the NDOH to equip professional nurses to fulfill their role as outreach team leaders.

Table 11: Outreach team leader characteristics

Characteristic	Result (N=8)
Level of Education	*No. of OTLs*
Undergraduate qualification	8
Postgraduate diploma (primary healthcare nursing)	3
Training	*No. of OTLs*
Trained in Ward Based Outreach Team leadership	6
Work Experience	*Median(IQR)*
Duration of experience as a professional nurse in the previous two jobs	86 (11-134)
Duration in current job as an outreach team leader	24 (23-36)

WBOT composition

The characteristics and composition of WBOTs are described in Table 12. All teams had a professional nurse as an OTL. There was one OTL for both

WBOT 8 and 9. None of the teams had an EHP or HP; however, four WBOTs were supported by a health promoter at the facility. The number of households allocated to each WBOT ranged from 1750 to 2000. All nine teams allocated 250 households per CHW and each team had between seven and twelve CHWs.

Table 12: Ward based outreach team characteristics and composition

	Characteristics and composition of WBOT						
Team number	**Has a Prof. nurse OTL**	**OTL is PHC trained**	**No. Of HHs allocated to team**	**No. Of CHWs per team**	**HHs per CHW**	**HP in the team**	**EHP in the team**
WBOT 1	✓	X	1750	7	250	X	X
WBOT 2	✓	X	2000	8	250	X	X
WBOT 3	✓	X	2000	8	250	X	X
WBOT 4	✓	X	2500	10	250	X	X
WBOT 5	✓	✓	2500	10	250	X	X
WBOT 6	✓	✓	2000	8	250	X	X
WBOT 7	✓	X	2000	12	250	X	X
WBOT 8*	✓	✓	2000	8	250	X	X
WBOT 9*	✓	✓	2000	8	250	X	X

Notes
*One OTL is shared between WBOT 8 and 9
✓ = Yes; X= No
HH=households, HP = Health Promoter, EHP =Environmental Health Practitioner

Adherence of WBOT composition and CHW characteristics to national guidelines

The extent to which WBOT characteristics and composition adhered to guidelines is outlined in Table 13. None of the teams adhered to the guidelines on team composition (all teams had more than the recommended

number of CHWs per team). All teams had more than the required number of households per CHW and per team.

Table 13: Ward based outreach team characteristics and composition: adherence to national guidelines

National guidelines on WBOT characteristics and composition	No. Of teams with characteristics adherent to guidelines *(N=9)*
1620 Households per team	None All teams had more households than prescribed in the guidelines
6 CHWs per team	None All teams had more than the required number of CHWs
270 Households per CHW	None All CHWs' had fewer than the prescribed number of households
1 Professional nurse (OTL) per team	Seven Two teams shared a OTL and so did not have their own
Each WBOT should consist of an health promoter (HP) and environmental health practitioner (EHP) where these exist	None No team had a HP or EHP within the team

Table 14 outlines the extent to which CHW characteristics adherence to national guidelines. This shows that 64% lived in the ward in which they worked and 81 % had at least one year CHW experience.

Table 14: Community health workers characteristics: adherence to national guidelines

National guidelines	No. (%) of CHWs who met NDOH guidelines *(N=79)*
CHW should reside in the ward where they work	51 (64%) lived in the ward in which they worked
Functionally literate	77 (97%) had a formal education (i.e. primary education or higher)
A CHW should complete 69 days or ancillary health care training and Phase 1 training	46 (58%) completed the 69 days training or ancillary training and Phase one training.
A WBOT member should have had at least 1 year prior experience as a CHW	64 (81%) had at least one year prior experience as a CHW before joining a WBOT team

3.1.2. Resources for providing MCH services

Availability and source of supplies for conducting MCH activities

According to the OTLs, all WBOTs received the supplies needed to do activities within the households from the clinic. All CHWs were sponsored with a kitbag by NDOH after the phase one training and were supposed to keep the supplies provided to them within these kitbags. FMs were responsible for supplying the teams with the necessary supplies. CHWs were also supposed to keep MCH forms to record information about antenatal and postnatal woman and children. These forms were supplied by the OTL at the clinic. It was the responsibility of the relevant contracted NGO to replace CHW kits bags and supplies where necessary. All six NGOs were involved in providing some form of resources to WBOTs. All six NGOs provided their respective

CHWs with a monthly stipend, and three provided uniforms and name badges for the CHWs that were contracted to them.

As Table 15 presents, not all CHWs had the necessary supplies in their kitbags on the day of the audit. The results show that: more than three quarters of CHWs had four of the eight types of supplies that were audited; just over half had a checklist which guides CHWs on what to do during household visits; few had a thermometer and only one had a pregnancy wheel which is needed to calculate the gestational age of a pregnant woman in order to plan follow up visits. The audit showed that almost all (99%) CHWs had the required referral forms in their bags. A total of 79% of CHWs had the original kitbag sponsored to them in good condition at the time of the audit while 21% of the CHWs had replaced worn out kitbags with their own bags.

Table 15: Availability of supplies for conducting maternal and child health activities

Supplies that should be in the Kitbags	No. Of CHW that had the supplies in the kitbag (N=79) No. (%)
Checklist of activities to be done	43 (54)
Referral forms	78 (99)
MCH forms	78 (99)
Pregnancy wheel	1 (1)
Mid upper arm circumference tape measure	72 (91)
Disposable thermometer	12 (15)

Challenges regarding availability of resources

OTLs, facility managers, and NGO managers reported various challenges with availability of resources for CHWs to function. Table 16 summarizes the resource challenges that the OTL, FM and NGO managers felt may affect provision of services by WBOTs.

Table 16: Challenges experienced by facility managers, outreach team leaders and NGO managers in providing resources

Outreach team leader	Facility manager	NGO manager
No space to meet with the team at the clinic to have team meetings. Sometimes meet outside the clinic or in the clinic waiting room. No space at the clinic to keep household and client forms completed by the CHWs There is no transport to supervise household visits with the team. There are no supplies (e.g. no thermometers).	There is no space for the WBOTs to meet and keep their kitbags at the clinic. There are no cars for OTLs to do visits with the teams. There is no budget for WBOTs so it difficult to supply the teams with everything that they need.	Do not receive funds to pay CHW stipends on time from the department of health. Unable to always supply stationery and resources for CHWs to conduct household visits because the NDOH provides funding late

One of the challenges commonly reported by OTLs is the lack of space and transport. In order to function well, WBOTs also require space where they can meet as a team; and the team leaders require transport in order to conduct supervision visits in the community. It is the responsibility of the facility

manager to provide space at the clinic to accommodate the CHWs and to assist the OTL with arranging transport. Only five of nine teams had space available for them to meet at their designated clinic. OTLs also experienced challenges with transport - only one OTL had designated transport for conducting supervised household visits. Another challenge facing the WBOTs, as reported by OTLs is that the supplies needed by the CHWs often ran out and were not always replaced. Table 17 describes the number of teams reporting that essential supplies that should be in CHW kitbags had been out of stock in the three months preceding the study.

Table 17: WBOTs with required supplies out of stock

	Supplies out of stock in the last three months				
WBOT	**Pregnancy wheel**	**MUAC tape measure***	**Disposable thermometer**	**MCH forms**	**Referral forms**
WBOT 1	✓	-	✓	-	-
WBOT 2	✓	-	✓	-	-
WBOT 3	✓	-	-	✓	✓
WBOT 4	✓	-	-	-	-
WBOT 5	✓	✓	✓	-	-
WBOT 6	✓	-	-	-	-
WBOT 7	✓	-	✓	-	-
WBOT 8	✓	-	✓	-	-
WBOT 9	✓	-	-	-	-

✓ = Yes - = No * MUAC= mid upper arm circumference

3.2. Processes for the provision of Maternal and Child Health services

3.2.1. MCH services provided by WBOTs at the households

Registration of maternal and child health clients

The median duration for a WBOT to complete registration of all its allocated households was 6 months (IQR: 4-10). A total of 18750 households were registered by WBOTs across the EHD during the study period. During the study period the nine WBOTs registered 385 pregnant women. Of these, 319 were registered when they were 32 weeks of gestation or earlier and 66 were more than 32 weeks gestational age when first seen by a CHW. A total of 95 women who had delivered 14 days or earlier were also registered (Table 18).

Not every CHW registered a pregnant or postnatal woman during the study period. Sixty six CHWs (84%) registered at least one antenatal client, but only 42 (53%) registered at least one postnatal client. The 66 CHWs who registered at least one antenatal client saw between 1 to 21 clients each (median: 4; IQR: 2-7); while the 42 CHWs who registered postnatal clients saw 1 to 9 clients each (median: 1; IQR 0-2). Overall, 69 CHWs (87%) saw at least one maternal client (either an antenatal or postnatal woman).

Table 18: Maternal clients registered by community health workers during January to June 2013

WBOT	No. of Households registered	Antenatal clients registered			Postnatal clients registered	Total antenatal and postnatal clients registered
		Gestational age ≤ 32 weeks	Gestational age > 32 weeks	Total antenatal clients registered	≤ 14 days postpartum	
WBOT 1	1750	25	7	32	4	36
WBOT 2	2000	57	6	63	12	75
WBOT 3	2000	26	6	32	6	38
WBOT 4	2500	10	3	13	4	17
WBOT 5	2500	57	11	68	12	80
WBOT 6	2000	58	13	71	9	80
WBOT 7	2000	39	7	46	15	61
WBOT 8	2000	24	11	35	21	56
WBOT 9	2000	23	2	25	12	37
Total	**18750**	**319**	**66**	**385**	**95**	**480**

Data presented in Table 19 on registration of children under five were collected per clinic site (and are therefore combined for WBOTs two and three; WBOTs five and six and WBOTs eight and nine). There were 2888 children under five registered of which 191 (7%) were identified as not having their immunizations up to date.

Table 19: Registration and identification of unimmunized children under five years of age

WBOT	No. of households registered	No. of children under 5 registered	No. of registered children under 5 found to be not immunized
WBOT 1	1750	426	16
WBOT 2 and 3	4000	455	42
WBOT 4	2500	397	5
WBOT 5 and 6	4500	923	57
WBOT 7	2000	398	57
WBOT 8 and 9	4000	289	14
Total	**18750**	**2888**	**191**

Provision of MCH services

OTLs were asked what kinds of MCH services they provided at household level in each of the following areas defined in the national guidelines: screening, assessment and referral; information and support; psychosocial support; and management of common illnesses. The results show that all teams reported providing MCH services within each of these areas. Table 20 summarizes the types of activities performed by CHWs when providing these services.

Table 20: Maternal and child health activities provided by ward based outreach teams: Outreach team leader perspectives on services provided

Services provided	Activities done by CHWs
Screening, assessment and referral	Assess pregnant woman, newborn babies for any illness and refer to the clinic if needed.
	Check the road to health book for immunizations done and the antenatal book for appointment dates.
	Refer pregnant woman for antenatal clinic booking if not done so already.
	Follow up to ensure that the client goes to the clinic.
Information and support	Provide health education on prevention of disease, the importance of immunization, and recognizing danger signs for newborn babies.
	Provide counseling on the importance of breastfeeding and family planning.
	Teach mothers how to care for themselves during pregnancy according to their gestational age.
	Provide information on birth registration and when to go to the clinic for follow up.
Psychosocial services	Conduct follow up visits to mothers during pregnancy and after birth to check how they are doing.
	Provide reassurance to mothers about their babies and provide information on how to cope with stress.
	Refer to the social worker for any social problems, application of birth certificates and identity documents.
	Set up support groups in the community with donations of food and clothes.
Management of common illness	Provide oral rehydration solution for diarrhea and vomiting, hand hygiene and safe home remedies.

Referral and follow up of maternal and child health clients

All the WBOTs conducted household visits to the 385 pregnant and postnatal women that they had registered during the study period. In practice they

collectively conducted 714 antenatal visits (639 before 32 weeks gestation and 75 after 32 weeks) and 192 postnatal visits (Table 21).

All 191 children that were identified by a CHW as unimmunized were referred to the clinic for immunization.

Table 21: Follow up of maternal clients by community health workers

WBOT	Number of antenatal follow-up visits done			No. of PNC follow up visits done ≤ 14 days post-delivery	Total ANC and PNC follow-up visits done
	No. of follow up visits done ≤ 32 weeks gestation age	No. of follow up visits > 32 weeks gestation age	Total ANC follow up visits done		
WBOT 1	36	7	47	4	51
WBOT 2	110	6	120	26	146
WBOT 3	69	6	87	12	99
WBOT 4	18	3	21	9	30
WBOT 5	118	12	152	28	180
WBOT 6	101	13	117	18	135
WBOT 7	81	8	95	38	133
WBOT 8	59	12	87	33	120
WBOT 9	47	8	83	24	107
Total	**639**	**75**	**714**	**192**	**906**

* CHWs are expected to do follow-up visits in pregnant women before 32 weeks gestational age and in postnatal women within 14 days of delivery

OTL and FM experiences of providing WBOT services

Details on experiences and challenges of providing MCH services through WBOTs are presented in Table 23. According to respondents, both OTLs and FMs had important roles in ensuring the provision of services by WBOTs. OTLs understood their role to be supervising individual CHWs with activities within the households. FMs understood their role as supervising the OTL and the entire team, ensuring that services were delivered to the community.

Table 22: Outreach team leaders and facility managers' experience and perceptions of service delivery

	OTL perspective	FM perspective
Role in ensuring WBOT provide services to the community	The role of the OTL is to provide in service training to CHWs and to conduct household visits with them. OTL are to ensure that the CHW are doing the correct activities in the household.	The role of the FM is to motivate and encourage the WBOT by providing them with resources to do their activities and to ensure that they feel part of the clinic.
Challenges faced by WBOTs in delivering services	Challenges identified by OTLs: CHW lack of knowledge – Not identifying sick patients – Not referring patients that need to be referred – CHW unable to answer questions asked from patients – CHW answering questions incorrectly or giving incorrect advice – CHW not confident CHW not being able to do all the required household visits – Patients moving, especially pregnant women – Patients not at home during the week when CHWS do their visits. – Family members not wanting CHW to come into the home – Mothers not wanting CHW to see their new born babies	Challenges are identified by FMs: The community not wanting CHW into the households Other NGO working in the community with multiple CHW visiting the same households. Therefore there is duplication of CHW roles in the community with NGO Patients don't want to go to the clinic when referred because the clinic is full. Concerns about CHW safety in the community
Addressing the challenges	OTLs have attempted to address these challenges by providing in-service trainings to CHW to address gaps identified in their knowledge and skills. Also, regular meetings with CHWs? Are held to come up with solutions, and some? OTLs conduct supervised household visits with CHWs.	FMs felt that they can't really do much to address the challenges. However, three FMs reported that they have meetings with the teams to come up with solutions

All OTLs and FMs reported that their respective WBOTs experienced challenges with providing services. Commonly reported challenges were: CHWs not identifying sick patients adequately and referring them to the clinic, patients not being at home when CHWs got there for a home visit, pregnant women moving away from the area to give birth in another city, and mothers not wanting CHWs to see their new born babies due to cultural reasons. Some FMs reported attempting to address some of the challenges faced by the WBOT.

3.2.2. Referral linkages between WBOTs and clinics

All except one FM had identified a method in which clients were referred to the clinic. Referral methods implemented by facility managers for linking WBOTs to their clinics include the following:

- CHWs complete referral forms for clients that need to be referred to the clinic. These clients are seen by the relevant OTL at the clinic and followed up by the CHWs and OTL after two weeks. The OTL and the CHWs therefore link the community to the clinic.
- CHWs refer clients to the clinic and these clients are seen by a staff member at the clinic who records information of the consultation on the back of the referral form and hands the form either to the OTL or the CHWs to continue care at home. The referral form used allowed the CHWs to continue care of the patient at home and therefore link the client to the clinic.

Several challenges were identified with referrals and include the following:

- Nursing staff at the clinic did not complete the referral forms when consulting clients and CHWs therefore were unable to continue care for the client at home.
- Clients referred by CHWs to the clinic wanted to be seen by the OTL at the clinic and this is not always possible.
- Clients referred to the clinic often did not go to the clinic because the clinic was too full.
- Clients referred to the clinic sometimes did not take the referral forms with them to the clinic and sometimes lost the forms.

The FMs felt that the benefits of CHWs referring clients to the clinic were: referrals by CHWs improved immunization coverage improved the antenatal booking rate, allowed clinics to detect patients who has defaulted treatment, and assisted sick patients in the community who are in need of medical care to come go the clinic.

3.2.3. Support and supervision for the provision of WBOT services

All OTLs reported providing supervision to their WBOTs, including: doing supervised household visits with CHWs, holding individual meetings with CHWs so that they may report on their progress, and providing in-service training (Table 24).

Table 23: Support and supervision of community health workers by outreach team leaders

		Nature of support and supervision provided to CHWs by outreach team leaders				
OTL	**WBOT**	**Conducts supervised household visits with CHWs**	**Meets individual CHWs**	**Meets CHWs as a team**	**Provides in-service training to CHWs**	**Checks CHW forms**
OTL 1	**WBOT 1**	✓	✓	✓	✓	✓
OTL 2	**WBOT 2**	✓	✓	✓	✓	✓
OTL 3	**WBOT 3**	✓	✓	✓	✓	✓
OTL 4	**WBOT 4**	✓	✓	✓	✓	X
OTL 5	**WBOT 5**	✓	X	✓	✓	X
OTL 6	**WBOT 6**	✓	X	X	✓	X
OTL 7	**WBOT 7**	X	X	✓	✓	X
OTL 8	**WBOT 8**	✓	X	✓	✓	✓
OTL 8	**WBOT 9**	✓	X	✓	✓	✓

✓ =yes; x = no

CHW perceptions regarding the support and supervision they received from their OTLs are presented in Table 25. The vast majority of CHWs (87%) agreed they received individual and group supervision from their OTL, and 77 (97%) reported that when the OTL is not available the other team members assisted them me with activities. Fewer (73 %) CHWs reported that their OTL conducted supervised household visits with them (Table 25).

Table 24: Community health workers perception regarding support and supervision from the OTL

Statement on perception of support and supervision by OTL	No. of CHWs who strongly agree / Agree (N=79)	No. of CHWs who strongly disagree / disagree (N=79)
	No. (%)	No. (%)
The OTL helps us to work together as a team	79 (100)	0
The OTL gives me individual feedback on my work	69 (87)	10 (13)
The OTL gives the whole team feedback on their work	78 (99)	1 (1)
The OTL conducts HHV to supervise my work	58 (73)	21 (27)
The OTL provides in service training	70 (91)	7 (9)

The FMs also played a role in providing support and supervision to the WBOTs. Their roles included having regular meetings with their team/s to assess how they were doing and to check the team data on providing services. The experiences of the FM and OTL with receiving support and supervision are summarized in Table 26.

Table 25: Outreach team leader and facility managers' experience of receiving support and supervision

	OTL	FM
Experience and perceptions of receiving support and supervision	Receive little support from NGO and FMs Few support visits from managers at the district	Minimal or no support given to FM. Uncertainty about who should be giving support and supervision to FMs
Challenges with receiving support and supervision	FMs don't know much about WBOTs and what OTLs should be doing. WBOTs are not recognized at the clinic. FMs don't help OTLs with addressing challenges. FMs just check monthly stats but don't really know what is going on. Nobody notices what you do.	Little communication from the district. Don't receive any supervision

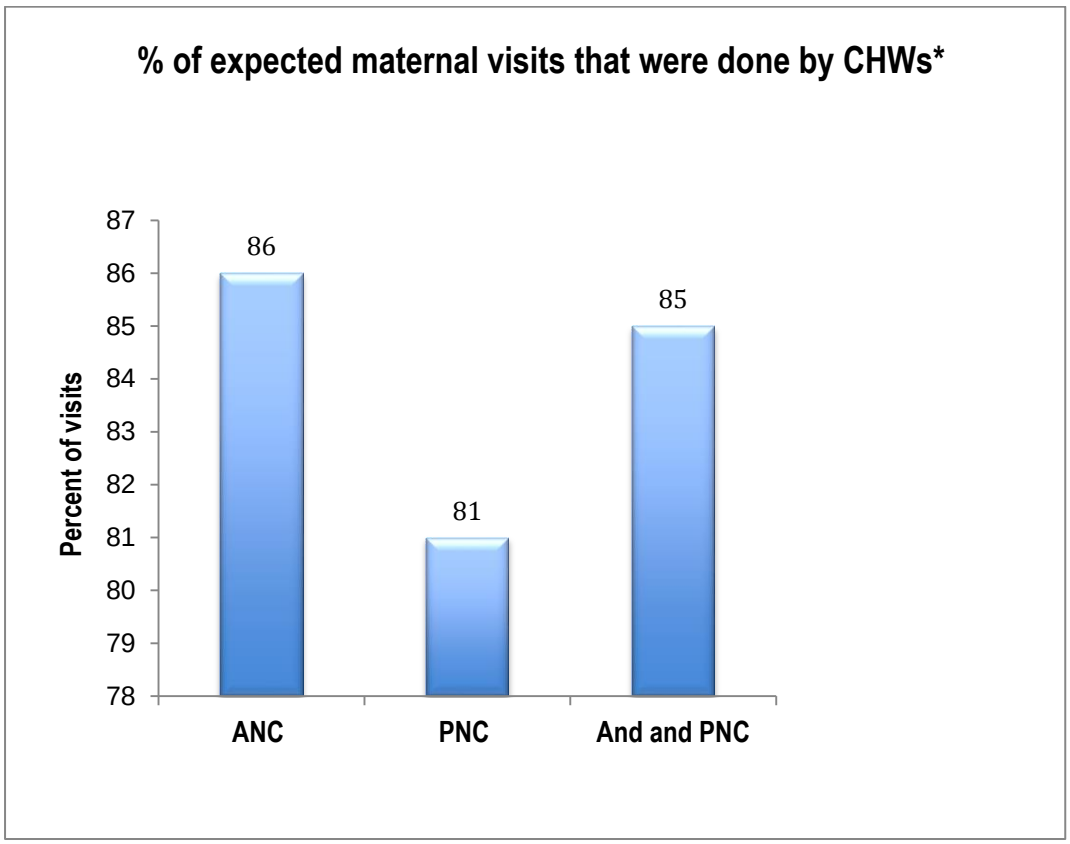
3.3. WBOT program outputs

To describe WBOT outputs, this section presents data on the appropriateness of follow up visits for maternal clients and child health referral and follow-up visits in relation to national guidelines.

Adherence of maternal and child health follow-up visits to guidelines

During the study period, the teams should have collectively conduct 977 maternal follow-up health visits (739 antenatal and 238 postnatal visits) if they were to be in accord with the guidelines.

The findings show that the CHWs actually conducted 714 antenatal follow-up visits, and 639 (89%) of these were done before 32 weeks gestational age (as per guidelines), while all 192 postnatal follow-up visits were done within 14 days of delivery as required. When only expected visits (antenatal visits before 32 weeks gestation and postnatal visits within 14 days of delivery) are considered, 639 (86%) of 739 expected ANC visits and 192 (81%) of 238 expected PNC visits were done. So, in total, 831 (85%) of 977 expected ANC and PNC follow up visits were done (Figure 5) and 146 (15%) were missed.



***Expected No. of maternal visits = 977**

Figure 4: Expected number of antenatal and postnatal visits that were done

All 191 unimmunized children identified by WBOTs were referred by a CHW to the clinic for immunization. However, not all referred children had a follow

up visit at home by a CHW after the referral – as required by the guidelines. Of 191 unimmunized children referred to the clinic by a CHW, 149 (78%) had a subsequent follow-up visit. However, only 56 children of these children (29% of those referred) were followed up within two weeks as recommended in the guidelines (Table 27). The percentage of referred children appropriately followed up within two weeks varied across WBOTs – ranging from 9% (Teams 2 and 3) to 78% (Team 7).

Table 26: Unimmunized children under five years appropriately followed up after referral to clinic

WBOT	No. of unimmunized children under five referred to the clinic for immunization	No. of referred unimmunized children that were followed up within two weeks as per guidelines No. (%)
WBOT 1	16	12 (75)
WBOT 2 and 3	42	4 (9)
WBOT 4	5	1 (25)
WBOT 5 and 6	57	31 (54)
WBOT 7	57	45 (78)
WBOT 8 and 9	14	3 (21)
Total	**191**	**56 (29)**

Data on the timing of follow-up visits done for referred unimmunized children are shown in Figure 6. The results show that 49 % of referred children were followed up only after the stipulated two weeks (but within 6 months after the

referral) and 22% had no follow up visits done (Figure 6). All children that were followed up had a documented immunization status.

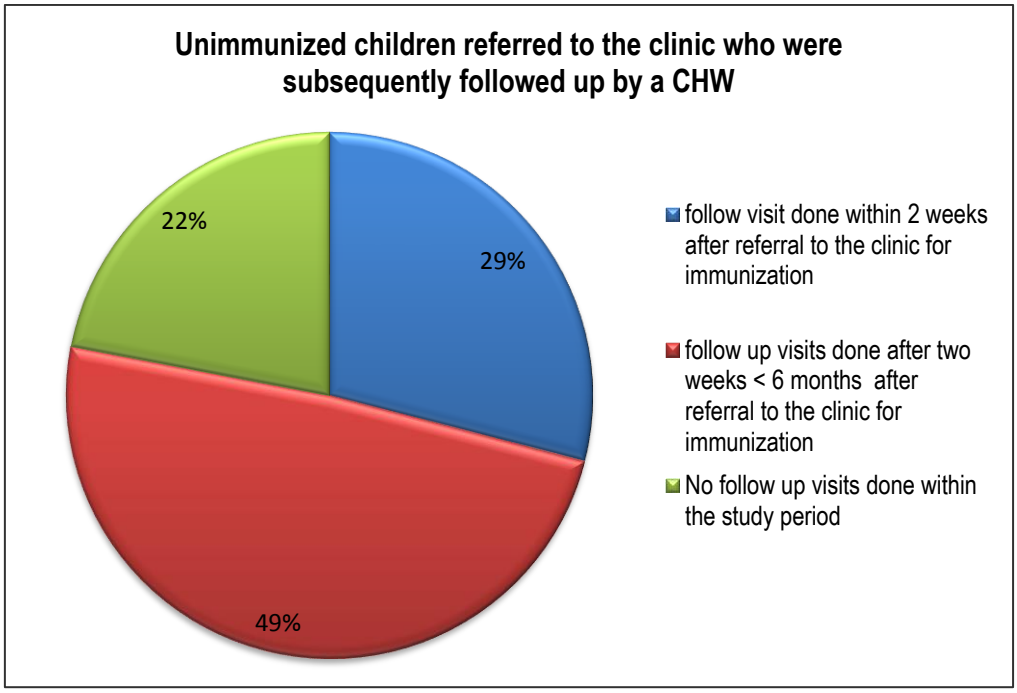


Figure 5: Follow up visits done for unimmunized children referred to the clinic

3.4. Association between CHW characteristics and adherence to guidelines regarding follow up of antenatal and postnatal women

The bivariate analysis using the Rao Scott technique shows that CHWs who conducted a higher proportion of expected visits were older (age ≥ 49 years of age); had a lower education level; and had a poorer maternal health knowledge score than those who conducted fewer visits (Table 28). Working in the ward where one lived did not make a difference as to whether a CHW did more visits or not. CHWs who had done the NDOH recommended training conducted a higher proportion of expected visits than those who had not done the training (p=0.0376) (Table 28).

Table 27: Proportion of missed visits by CHW characteristic

CHW characteristic	Level	Visits missed (N=146) N (%)	Visits done (N=831) N (%)	P value*
Age	20-29 years	33 (19)	143 (81)	0.6464
	30-39 years	82 (16)	439 (84)	
	40-49 years	31 (13)	201 (87)	
	49+ years	0	48 (100)	
Level of education	< Matric	51 (11)	431 (89)	0.0973
	≥ Matric	95 (19)	400 (81)	
Duration of CHW experience (months)	0	58 (24)	180 (76)	0.1390
	1-24	21 (18)	97 (82)	
	25-48	30 (11)	243 (89)	
	49+	37 (11)	311 (89)	
Attendance of NDOH-prescribed training	Yes	47 (9)	433 (91)	0.0376
	No	99 (19)	398 (81)	
CHW Knowledge score	1	47 (16)	242 (84)	0.4613
	2	39 (11)	309 (89)	
	3	39 (22)	136 (78)	
Works in ward they live	Yes	103 (15)	578 (85)	0.9199
	No	43 (15)	253 (85)	

*The Rao Scott correction to the chi square test

The logistic regression analysis shows that CHWs who attended the NDOH-prescribed training were less likely to miss visits than those who had not done the training (unadjusted odds ratio 0.43; 95% CI 0.19-0.96). The adjusted odds ratio however did not show any statistical significance (AOR 0.51 95 % CI: 0.22-1.14) (Table 29). As found for the bivariate analysis, age and level of education were not associated with missing visits (Table 29).

Table 28: CHW characteristics associated with missed visits

CHW characteristic	Missed Visits N (%)	Crude OR (95 % CI)	P value	Adjusted OR (95% CI)	P value
Age					
20-29 years	33 (19)				
30-39 years	82 (16)	1	**0.118**	1	**0.98**
40-49 years	31 (13)	0.96 (0.92-1.00)		0.98 (0.92-1.04)	
49+ years	0				
Level of education					
<Matric	51 (11)	1	**0.102**	1	**0.433**
≥ Matric	95 (19)	2 (0.86-4.6)		1.46 (0.55-3.84)	
NDOH training					
No	99 (19)	1	**0.041**	1	**0.101**
Yes	47 (9)	0.43 (0.19-0.96)		0.51 (0.22-1.14)	

CHAPTER FOUR: DISCUSSION

This study evaluates the implementation of the WBOTs in the EHD, with focus on assessing whether implementation is in accordance with national guidelines, whether some necessary inputs, process and outputs of the CHW program are in place, and whether there is an association between desired CHW characteristics (as defined in national guidelines) and CHW adherence to the guidelines on follow up of maternal health clients. The study finds that CHW program implementation adhered to the guidelines in some aspects (such as all teams had met (and exceeded) the minimum required number of households allocated per team and the number of CHWs per team) but not in other aspects (such as only 64% of CHWs lived in the ward where they worked and not all CHWs had attended the NDOH-prescribed training). The study highlights some positive aspects such as CHWs adhering to guidelines regarding the referral of all unimmunized children under five and conducting a high number (93%) of expected follow up antenatal and postnatal visits. However, it also identifies some challenges, which may hamper the success of the WBOT program (such as limited availability of resources, poor CHW knowledge, and poor support and supervision of the program from senior managers). This chapter discusses the results, the implications of the findings as well as the limitations.

4.1. WBOT program Inputs

The study showed that the WBOTs had more than the recommended number of CHWs to cover the allocated number of households. However, if one considers the provincial guidelines, all teams had just the right number of allocated households and CHWs per team (15). The teams had sufficient numbers of CHWs but lacked the necessary resources to conduct household activities and although many were trained they had poor knowledge scores. These factors may have contributed to the challenges faced by the teams during implementation.

Community health worker training and knowledge

Only 58 % of CHWs had attended the recommended NDOH training. This has implications for service delivery in the households, because if CHWs are not adequately trained, they will be unable to conduct the necessary activities within the households. Studies on CHW training have shown that CHWs who receive less frequent trainings feel that they lack adequate skills to do activities (57). Studies have shown that CHWs require ongoing trainings and refresher courses to improve their skills which in turn improves the success of the program (47,48,57). It is unclear in this study why despite training CHWs had poor knowledge. Perhaps ongoing in-service training and assessments need to be conducted to ensure retention of knowledge. As a study in South Africa found, CHWs who were trained on diabetes and hypertension were able to retain their knowledge after one year of completing the training (58).

The contribution of interactive lessons, practical sessions and field work contributed to the successful retention of knowledge.

A study done by Abrahams Gessel et al in four countries (Bangladesh, Guatemala, Mexico and South Africa) on training CHWs found that effective training of CHWs on cardiovascular disease increased CHW knowledge and this knowledge was retained six months after the training (59). The approach used to train CHWs in that study consisted of lectures with interactive activities and customized to individual sites. Instruction was delivered in multiple languages and practicals conducted on site. Quantitative assessments on cardiovascular disease knowledge and practical skills were conducted. This approach led to the success of the CHW program (59). Other research shows that some of the factors contributing to the failure of CHW training programs include: lack of supervision during training, complex training courses and no refresher courses conducted (46). These training-related barriers result in poor success of CHW programs (46). CHW training needs to be a combination of didactic teaching with interactive sessions involving group discussions, role playing, simulations and field work (10).

In this study, CHW knowledge scores on MCH were low (median score of 6 out of 15; IQR 5-7). A study done in India looking at the effect of CHW knowledge on newborn care found that there were more antenatal and postnatal home visits done by the CHWs who had more knowledge (60). That study found that the higher knowledge CHWs had, the more antenatal visits they did, and that more knowledge resulted in CHWs adherence to newborn care activities in the households. That finding is in direct contrast to this

study's results where the higher the knowledge score, the higher the proportion of missed visits. However, the overall knowledge of all CHWs in this study was generally poor, so even those who did more visits had poor knowledge. The poor knowledge scores are in keeping with OTL reports that CHWs often lacked confidence with answering questions from clients and with identifying sick clients that needed referral. These findings indicate a need for on-going training, support, and supervision.

Despite a poor knowledge score CHWs adhered to the guidelines regarding doing the right number of follow-up visits for antenatal and postnatal women. This could be because CHWs relied on their training manual checklist to guide them on what visits to do, rather than their own knowledge. The poor knowledge score suggests that even though the CHWs did the right number of visits, they may not have known what to do when they got to the home. The low knowledge raises concerns about the CHW training and the methods used to provide this training.

Resources

CHWs lacked some of the necessary resources and supplies to conduct activities in the households. For example, a pregnancy wheel is necessary to calculate the gestational age on the first home visit in order to plan future follow up visits as per guidelines. In this study where almost none had a pregnancy wheel, it means the CHWs did not have the means to calculate the gestational age. CHWs relied on the pregnant woman's antenatal book for the

gestational age of the women because they could not calculate the women's gestational age and they did not have a pregnancy wheel. This is unreliable especially if the pregnant woman has not been to the clinic and does not have such a book. Studies have shown that CHWs require the necessary resources to be more productive and to have better outcomes (60,61,62) .

4.2. WBOT program processes and outputs

Despite challenges with providing services due to lack of resources and poor knowledge, CHWs adhered to the guidelines regarding maternal follow up visits and referral of unimmunized children under five, however they did not follow up all referred children as required.

Referral and follow up of maternal and child clients

This study shows that CHWs did refer clients to the clinic and had enough referral forms with them to do so. CHWs referred all unimmunized children that they picked up during the household visits to the clinic, but did not follow up to check that the referred clients had gone to the clinic and been immunized. The CHWs followed up 29% of unimmunized children referred to the clinic after two weeks and a further 49 % after two weeks but within six months. This highlights the fact that CHWs are registering and correctly referring clients but are not fully adhering to the guidelines regarding follow up of referrals. The reasons may be that CHW don't understand the guidelines or

the guidelines are not enforced by supervisors. Studies in South Africa and beyond have found that areas in which CHWs are placed have an improved immunization coverage (33,50). In Uganda, CHW-referred clients were seen preferentially at the clinic and this encouraged those referred to go to the clinic, and clients who were followed up by a CHW after attending the clinic were confident in the referral system (63).

CHWs however conducted 85% of the antenatal and postnatal follow up visits they were expected to do, indicating that CHWs did in fact do what they were supposed to do in terms of antenatal and postnatal follow up visits. This is encouraging given that maternal and child health activities are a new concept to these CHWs who largely have a background in HIV and AIDS care as home based care givers. The fact that CHWs adhered to the number of visits as set out in the guideline on maternal follow up visits is good. However the quality of what they were doing during these visits was not measured in this study, but should be assessed in future given their poor knowledge scores.

Support and supervision

It is evident from both the CHWs and the OTL responses that they feel support and supervision is provided by the OTLs to their teams. Almost all CHWs (99%) reported that the OTL gave the entire team feedback on their work and 91 % of CHWs stated that the OTL gave them in-service training. However, this study does not measure how support and supervision is given to the teams and whether it is appropriate or adequate. Although CHWs received in service training in this study, this did not reflect in their knowledge

score on MCH. The literature shows CHWs need to be constantly supported and supervised in order for the program to be successful (64,65). Supervision is motivating to CHWs and provides an opportunity for feedback and in service training, which may improve performance (48). Studies done on CHW programs however found that CHW often do not get adequate supervision and feedback from their supervisors (52,66). A study by Callaghan-Koru in Malawi showed that CHWs had to wait up to four months before a supervision visit was done (67). Successful supervision should go beyond just checking forms but should be used as a way to provide feedback and improve CHW skills (48). As a study done by Stekelenburg shows, poor supervision does not make a positive impact on CHW performance (64).

This study highlights the need to improve supervision of OTLs by their FMs and of FMs by district managers. Supervision at all these levels is important. Supportive management by FMs can be done by providing technical support, conducting monthly meetings with the WBOTs and managing referrals (68). In order for supervisors to be effective at all levels, supervisors need to be provided with tools and guidelines on providing supervision (68).

In summary, the inputs, processes and outputs measured in this study and discussed in this chapter, although presented as separate elements, interact and affect each other. The inputs such as training and processes such as support and supervision may affect the extent to which CHWs were able to refer and follow up MCH clients thereby affecting outputs. The interactions between these elements could have compromised CHW performance in areas of referral and follow up of MCH clients.

Another important issue for policy makers to consider is that contextual factors may also play a role in influencing CHW performance (missing visits). CHWs work in a particular context (e.g. limited resources and other factors) that may affect their ability to perform – and so training and knowledge may not be the only factors associated with missing visits. In this study a contextual factor, safety within the community, was raised as a concern by a facility manager. Some communities have been reportedly violent and this raises concerns of safety, which may hamper CHWs visiting some areas. Facility managers interviewed in this study have reported that CHWs therefore visit households in pairs for safety reasons. Cultural factors such as mothers not wanting community health workers to see their new born babies – as reported in this study – may also play a role in whether CHWs conduct the expected visits. Studies have shown other contextual barriers that can influence whether CHW can visit households to include: the economy, environment, health system policy and practice, gender norms, values and disease related stigma (51, 63, and 69).

Limitations of the study

There are several limitations for this study. Firstly, the study only included one district within Gauteng and did not include WBOTs from other districts, and this limits generalizability of findings to other districts and provinces. Secondly data could not be collected from the client records alone and outstanding information had to be collected from additional sources such CHW diaries and referral books. Thirdly, the implementation toolkit as well as CHW training

manual was used as the national guidelines against which activities were assessed because there are no national policy guidelines for the WBOTs. Fourthly, regarding the analysis: since there are too few teams, statistical analyses could not be done at a team level to compare across teams. Also, because the visits were aggregated amongst all the CHWs, individual CHWs adherence could not be assessed. Fifthly, we were also unable to measure what WBOTs did at the households and we were unable to determine the reasons as to why activities such as referrals were done poorly or why there were a lack of resources. Success and enabling factors in this regard was not addressed and therefore serves as a limitation. Lastly the study does not look at program outcomes as it is too early to assess outcomes and therefore only outputs were assessed.

There was also a possibility of information bias as some of the study participants interviewed knew the researcher as part of the district team and may therefore have provided more positive responses.

CHAPTER FIVE: RECOMMENDATIONS AND CONCLUSION

5.1. Recommendations

The following recommendations are provided to future WBOTs, supervisors, and program managers.

5.1.1. Recommendations for national and provincial level

Policy makers should consider the following recommendations:

I. The WBOT program model

- OTLs based at a clinic facility are required to spend 70 % of their time on WBOT activities and 30 % of their time at the clinic. This creates a problem for OTLs to supervise CHWs during household visits, especially when the clinic is busy. Policy makers should thus consider allocating OTLs who will spend their time fully dedicated to the WBOT program rather than sharing WBOT time with clinic duties. This may improve support and supervision of the CHWs.

II. Training

- The training provided to CHWs needs to be assessed for adequacy and quality in light of the fact that although CHWs were trained, they had a poor knowledge score. The manner in which CHWs are trained and the training providers need to be carefully considered in the future.

5.1.2. Recommendations for District Level

I. Support and supervision for WBOTs

- District support in terms of resources such as forms used by CHWs and supplies such as pregnancy wheels is greatly needed for WBOTs. Official transport must be made available to OTLs in order for them to feasibly supervise CHW household visits as the program grows.
- In order to better manage additional teams in the future, the allocation of sub district co coordinators to provide support for WBOT supervisors and facility managers should be considered. These co coordinators could assist the district with establishing and supporting more teams as the program grows. This however could create a vertical program for WBOTs and therefore another approach is that WBOT coordination and support could be integrated into the sub district PHC program.
- Poor knowledge scores raise questions on whether CHWs know what to do when they are in the households. PHC coordinators could provide quality assurance for WBOTs to ensure that the teams are providing quality services in the households

5.1.3. Recommendations for facility Level

I. Referral linkages

- Facility managers could play a role in developing simple facility relevant referral protocols for CHWs and clinic staff. A well working referral system that sees clients referred to the clinic and followed up by the CHW has been shown to install confidence within CHW programs (64).

II. In service training

- The facility could play an important role in assisting OTLs to provide relevant, quality in-service training for CHWs. Staff at the clinic could for example be orientated about the WBOT program so that the in-service training does not rest on the OTLs alone but can be also provided by other staff members.
- Linked to this, FMs could ensure regular competency assessments of CHWs to assess their knowledge and growth.

III. Resources

- Given the proposed expansion of WBOTs, FMs should support the program by finding and providing space to accommodate the increasing number of CHWs at the facility. However some clinics are already overstretched, so the district should assist where necessary.

5.1.4. Recommendations for future research

Future research is recommended in the following areas:

I. This study assessed CHW adherence to guidelines regarding the referral and follow up of MCH and did not assess whether CHWs were doing the correct activities in order to provide quality services. Assessing the quality of care provided by CHWs is important to assess program outcomes.

II. This study only focused on CHW knowledge on MCH, which may not be a reflection of CHW knowledge in general. Expanding research should look at CHWs knowledge in other areas, such as HIV AIDs TB and chronic diseases.

III. This study did not address the issue of stipends given to CHW's as payment incentives or disincentives to performance. Future studies should look at how incentives such as stipends or disincentives play a role in CHW performance and adherence to guidelines.

IV. Explaining reasons for the extent and quality of referrals, support and supervision and the methods implemented warrants further research using a qualitative approach.

5.2. Conclusion

In response to providing primary health care as stated in the Alma Ata declaration, CHW programs have mushroomed across the globe and have shown to improve health outcomes. In South Africa, the implementation of the WBOTs is one of the three streams in the PHC restructured approach and is a relatively new program within the health system. This study describes the implementation of the first nine teams within the EHD and highlights some of the challenges that these teams are facing with program implementation. These challenges include: a lack of resources, poor knowledge, support, and supervision. These challenges may affect whether WBOTs will achieve the aims for which they were established. In order to improve the success of the WBOT program, these challenges need to be identified early on in the program rollout and should be addressed with the support from senior management at district, provincial and national levels. This study has proposed recommendations for how these challenges could be addressed.

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APPENDICES

Appendix A: Plagiarism Declaration

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG | FACULTY OF HEALTH SCIENCES

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I **Carmen Whyte** (Student number: **699451**) am a student

Registered for the degree of **Masters in Medicine in the field of community health** in the academic year **2015.**

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

Signature:



Date: **03 August 2015**

Appendix B: Community Health Worker Questionnaire

Implementation of the Ward Based Primary Health Care Teams in the Ekurhuleni Health District: A Process Evaluation

Community Health Worker Questionnaire

Participant code			
Date of Questionnaire:	DD	MM	YYYY

Introduction

Thank you for agreeing to participate in this study. I have some questions to ask you about the PHC outreach team program in your district, and specifically about your team and your role in the team. There are no right or wrong answers to the questions I will ask you. Please feel free to tell me your own ideas, and what you really think.

A. CHW Characteristics

Please fill in where space is provided

1. Gender:

   2.1 Male
   2.2 Female

2. What is the highest level of education you currently have?

   Please circle only ONE

   2.1 No education
   2.2 Grade 1-4
   2.3 Grade 8-11
   2.4 Matric certificate
   2.5 Tertiary certificate
   2.6 Tertiary Diploma
   2.7 Other (please specify)
   _____

3. Have you received any training to do your current job of providing Primary health care outreach services?

   3.1 Yes
   3.2 No

If you answered No to question 3, please do not answer question 4 and go directly to question 5

4. ***If you answered yes to question 7 above: please tell me more about*** the type of training you received for providing primary health care outreach services

Type of training	**Tick if you have had this training**
1.1 Have you received the 69 days training that is provided by the department of health?	
1.2 Have you had phase one Orientation and Training by the National Department of Health?	

1.3 If you have had training but it is not any of these in the list above, please write the training that you received in the box under here	**Who provided this training?**	**When was this training? (Month / Year)**	**How long was this training?(How many days**

2. Did you work as a community health worker before you started this job

   5.1 Yes

   5.2 No [if you answered No, ***skip question 10 and go straight to question 11***]

3. How long did you work in your previous job as a community health worker?

   _____ Years and _____ Months

B. <u>Support and Supervision</u>

Please kindly answer the next two questions by following the instructions in the boxes

	Circle yes or no	***Circle only one answer***
4. Do you meet with your team leader as **an individual** to plan what work you need to do?	1. Yes 2. No	**If you answered 'Yes' to question 11** How often do you meet with your team leader? 1. Daily 2. 2-3 times per week 3. Once per week 4. Once in two weeks 5. Once a month

5. For this question I have written down some statements and I would like you to please read each statement and then tick the box to show whether you agree with the statement ,strongly agree (agree very much), disagree with the statement or strongly disagree with the statement.

	Tick this box if you strongly agree with the statement	***Tick this box if you agree with the statement***	***Tick this box if you disagree with the statement***	***Tick this box if you strongly disagree with the statement***
5.1 My team leader helps us to work together as a team				
5.2 If my team leader is not available, other members of my team are able to assist me				
5.3 My team leader gives me feedback as **an individual** about how I am doing with my work				
5.4 My team leader gives us feedback **as a team** about how we doing with our work as a team				
5.5 The health promoter at the clinic helps me when I need assistance with health promotion				
5.6 My team leader conducts household visits with me to supervise my work				
5.7 My team leader provides in service training when we require it.				

C. Knowledge of PHC outreach work related to maternal and child health

The next few questions will focus only on maternal and child health issues. Please answer the following questions

15.1 How would you calculate the expected estimated date of delivery for a pregnant woman with a pregnancy wheel?

_____
_____

6. How do you calculate the expected date of delivery for a pregnant woman if you don't have a pregnancy wheel?

_____
_____

7. During your first visit to a household you see a pregnant woman who is HIV positive. List 4 things you should do?

1. _____
2. _____
3. _____
4. _____

8. List 3 things you should check for in a newborn during a postnatal home visit
1. _____
2. _____
3. _____

9. How would you explain to a mother who has a child with diarrhoea how to prepare a sugar salt solution for her child?

_____
_____
_____
_____

10. If during a household registration visit a community health worker (CHW) finds that a child in the household has missed some vaccinations, what should the CHW do?

	Tick this box if this **TRUE**	Tick this box if this is **NOT TRUE**
10.1 The CHW should refer the child to the clinic at the follow-up visit		
10.2 The CHW should refer the child to the clinic and return to the household to follow up.		
10.3 The CHW should first talk about it with the team leader and then refer the child to the clinic		

D. CHW Resources for the provision of maternal and child health services

11. In the last three months has there ever been a time when you did not have any of the following supplies? :		**Answer yes or no**	**If you answered 'yes', for how long did you not have the supplies? (Number of days)**
11.1	A pregnancy wheel		
11.2	A tape measure		
11.3	A disposable thermometer		
11.4	Cotton balls		
11.5	Referral forms		

12. Where do you get supplies from when you run out?

_____

The End

Thank you for completing the questionnaire. I appreciate the time you have taken to answer the questions

Appendix C: Outreach team leader interview

An Evaluation of the Ward Based Primary Health Care Outreach Teams in the Ekurhuleni Health District: A Process Evaluation

Ward Based PHC Outreach Team Leader Interview

Participant code			
Date of interview:	DD	MM	YYYY

Introduction

Thank you for agreeing to participate in this study. I have some questions to ask you about the PHC outreach team program in your district, and specifically about your team and your role in the team. There are no right or wrong answers to the questions I will ask you. Please feel free to tell me your own ideas, and what you really think.

A. Characteristics of the ward based PHC outreach team leader

1. How old are you? _____ Years

2. Sex
   2.1. Male
   2.2. Female

3. What is the highest educational qualification you have attained (specify qualification name)
   3.1. Undergraduate diploma (_____)
   3.2. Honours degree (_____)
   3.3. Undergraduate degree (Bachelors) (_____)
   3.4. Postgraduate degree (_____)

4. Have you had any primary health care training since qualifying as a nurse?
   4.1. Yes
   4.2. No
   4.3. If yes:
      4.3.1. When was the training: _____
      4.3.2. What was the training: _____

5. What are you currently registered as:
   5.1. Professional Nurse
   5.2. Staff nurse
   5.3. Enrolled nurse
   5.4. Midwife
   5.5. Community nurse
   5.6. Psychiatric nurse
   5.7. Other (specify) _____

6. I would like to know about your current job and where you worked before.

   6.1 What is your current job title at the health facility?
   _____

   6.2 How long have you been in this current position at the facility? _____Years ____Months

7 When were you appointed as a PHC outreach team leader? ____(Month) / _____(Year)

8. I know some personnel have undergone training to facilitate implementation of the PHC outreach services. Have you had any training to prepare you for implementing the ward based PHC outreach teams?

8.1 Yes
8.2 No

9 ***If answered YES to question 8*:** Please tell me about the training you have had

Description of the training	**Who provided the training?**	**When was this training?** ***Specify month/year***	**How long was this training?**
9.1 Training 1:			
9.2 Training 2:			
9.3 Training 3:			

10. What was your most recent job before your current position at the health facility?

_____

10.1 How long were you there? _____

10.2 What work did you do in that job? _____

11. And before that job where did you work?

_____

11.1 How long were you there? _____

11.2 What work did you do in this job? _____

B. Composition of ward based PHC outreach teams

12. How many CHWs do you have in your ward based PHC outreach team?
_____

13. Are any other cadres of health workers included in the team?
13.1 Yes
13.2 No

14 ***If Yes to Q 13***:

Cadre of health worker	**Number included in the team**	**What is their role in the team?**
14.1 How many Health promoters?		
14.2 How many Environmental health officers?		
14.3 Other (specify)_____		

C. Health Workforce

15 How many households are allocated to your team? _____

16 How many households are allocated per CHW? _____

17 When did you start your household registrations – as a team?
_____(mm/yy)

18 How long does it take for a community health worker to complete registration of all her/his allocated households? _____

19 Would you say this amount of time is just right? Or is it too short or too long? Pease explain?

_____
_____

D. Support and Supervision

		If 'Yes' to Q 21 or 22 How often do you meet with the CHW"s?
1. Do you meet with i**ndividual** CHWs to plan what work they need to do?	1. Yes 2. No	1. Daily 2. 2-3 times per week 3. Once per week 4. Once in two weeks 5. Once a month
2. Do you ever meet with your entire **team** to plan what work they need to do?	1. Yes 2. No	1. Daily 2. 2-3 times per week 3. Once per week 4. Once in two weeks 5. Once a month

3. I know the community health workers go out to do household visits. Can you tell me is there a way of providing support and supervision to CHW's? Please explain.

_____
_____
_____
_____
_____
_____
_____

Follow-on / probe questions

- can you tell me about your role?
- what happens when you are away?
- how do they get feedback on their work?
- do you conduct supervised home visits? How often
- is in-service training provided? Who provides it?

4. How do you ensure that the CHWs are doing their activities?

_____
_____

Follow-on / probe questions

- Meetings
- checking forms

5. Are there any challenges in proving support to CHWs? Please explain

_____
_____
_____
_____
_____
_____
_____

6. Could you please tell me about support for YOU?

26.1 Who do you go to when you need support with your work as a team leader?

_____

26.2 What support are you given when you go this person?

_____
_____
_____

26.3 Do you get support from anyone / anywhere else? Please explain?

_____
_____
_____

Follow-on / probe questions

- Kinds of support received?
- Any support from colleagues at clinic?

27 What challenges do you experience with getting support to do your work as a team leader?

_____
_____
_____
_____

28 Could you please tell me about supervision for YOU?

28.1 Can you tell me who supervises your work as a team leader?

_____

28.2 How do you feel about the supervision you receive?

_____
_____

29 What are the challenges you experience with getting supervision?

_____
_____

E. Service Delivery

30 The national implementation toolkit, states four main categories of activities to be done by the CHWs at household level. I would like to know more about these activities done by the CHW. Focussing on maternal and child health,

30.1 The first category is -screening, assessment and, referral.

- Is the team doing screening, assessment and referral for MCH? Please describe what they do._____
- How is the team doing in providing these services?_____
- What are the challenges in delivering these services?_____

30.2The second category is information and support.

- Is the team providing information and support for MCH? Please describe the kinds of activities they do._____
- How is the team doing in providing these services? _____
- What are the challenges in delivering these services? _____

30.3 The third category is psychosocial support

- Is the team providing psychosocial support for MCH? Please describe the kinds of activities they do._____
- How is the team doing in providing these services? _____

- What are the challenges in delivering these services? _____

30.4 The fourth category is management of common illness

- Is the team providing services to manage common illnesses for MCH? Please describe the kinds of activities they do._____
- How is the team doing in providing these services? _____
- What are the challenges in delivering these services? _____

31 What is your role as team leader in delivering these services?

_____
_____
_____

32 What are you doing to address the challenges?

_____
_____
_____

F. Referral linkages with the clinic Facility

33 Can you tell me how CHW's in your team refer patients to the clinic

Probe questions

- Do they know where to refer? How do they know?
- Referral forms
- Feedback

_____
_____
_____
_____

34 What happens after the referral?

-Back referral
-Follow up

_____
_____

35 What challenges do you face in referring patients to the clinic?

_____
_____
_____
_____

G. Resources

36 There are certain supplies that the CHW needs to provide maternal and child health services. In the last three months has there ever been a time when CHWs in your team did not have the following supplies?

		YES	NO
36.1	Pregnancy wheel		
36.2	A tape measure		

36.3	A disposable thermometer		
36.4	Cotton balls		
36.5	Referral forms		

37 Where do you get these supplies from?

_____

_____

_____

38 What happens if a CHW does not have:

38.1	A pregnancy wheel	
38.2	A tape measure	
38.3	A disposable thermometer	
38.4	Cotton balls	
38.5	Referral forms	

39 Is there space for your team to meet?

_____

40 Where do you meet? _____

41 Do you have access to a car for yourself to do home visits?

_____

The End

Thank you for participating in the interview. I appreciate the time you have taken to answer the questions.

Appendix D: Facility manager and NGO manager interview

Implementation of the Ward Based Primary Health Care Teams in the Ekurhuleni Health District: A Process Evaluation

Facility Manager and NGO Manager Interview

Participant code			
Date of interview:	DD	MM	YYYY

Introduction

Thank you for agreeing to participate in this study. I have some questions to ask you about the PHC outreach team program in your district, and specifically about your team and your role in the team. There are no right or wrong answers to the questions I will ask you. Please feel free to tell me your own ideas, and what you really think.

A. Participant Characteristics

1. How old are you? _____ years
2. Sex
   2.1 Male
   2.2 Female

B. Role of Managers

3.1 Have you been involved with implementing the PHC outreach teams in your ward/clinic?
_____

3.2 How have you been involved?
_____
_____
_____

C. Support and Supervision

NGO

4. I would like to understand more about your role in the program

Please kindly answer the following questions

4.1 Do you provide the CHW with a stipend? **Y/N**_____

4.2 Have you experienced challenges with providing CHW with the stipend?
Y/N_____

4.3 Can you provide examples? _____
_____

4.4 How have you addressed these challenges? _____
_____

4.5 Do you supply the CHW with uniforms?
Y/N_____

4.6 Do you supply the CHW with name tags?
Y/N_____

4.7 What challenges do you have with providing supplies to the CHWs_____

4.8 How do you address these challenges
_____

Facility Manager

5. What do you understand to be your role as a facility manager in the clinic to which the PHC outreach team is linked?
_____
_____
_____

Please kindly answer the next two questions by following the instructions in the boxes

	Circle yes or no	**If you answered 'Yes' to Q 6. Or 7** How often do you meet? ***Circle only one answer***
6. Do you meet with the team leader, to discuss her work and progress with the teams	6.1. Yes 6.2. No	1. Daily 2. 2-3 times per week 3. Once per week 4. Once in two weeks

		5. Once a month
7. Do you ever meet with the CHWs in the team to discuss their work and progress	7.1. Yes 7.2. No	1. Daily 2. 2-3 times per week 3. Once per week 4. Once in two weeks 5. Once a month

Please kindly answer the following questions

7. How do you provide support and supervision to the outreach team?

_____

_____

_____

_____

Follow-on/ Probe questions:

-Team work

-staff involvement

- When the team leader is away

-providing feedback

8. What are your challenges in proving support and supervision to the teams?

_____

_____

_____

_____

9. Who do you go to when you need support with outreach teams?

_____

10. What support are you given when you go this person?

_____

_____

_____

11. What challenges do you experience with getting support from your seniors?

_____

_____

12. Are you satisfied with the support you receive? **Y/N**_____
13. Please state why to your answer above?

_____

_____

_____

D. Service Delivery

NGO and Facility Manager

14. What is your role as an organization /Health facility in ensuring that the team provides health services within the community ?

_____

_____

_____

15. Are you aware of the challenges experienced with the teams providing services within the community?

    _____
    _____
    _____

16. Can you provide some examples?

    _____
    _____
    _____

17. How have you addressed these challenges?

    _____
    _____

E. Referral linkages to clinic facilities

Facility Manager

18. Can you explain how CHW's refer patients to the clinic?

    _____
    _____
    _____
    _____

19. Is the staff at the clinic aware of these referrals **Y/N?**_____

20. If you answered yes to the above , how does the staff manage these referrals ?

    _____
    _____
    _____
    _____

21. Do the staffs provide feedback to the team leader about the referrals? **Y/N**

    _____

22. If you answered yes to the above, what feedback is provided to the team leader?

    _____
    _____

23. How do you address the challenges you face with referrals from the CHW's?

    _____
    _____
    _____

24. Are referring patients to the clinic adding any value? **Y/N** _____

25. Can you give examples?

    _____
    _____
    _____

F. Resources

26. What happens when the outreach teams don't have the supplies they need?

_____
_____
_____

27. Where do you get the supplies from?

    _____

28. Is there space for the teams to meet at the clinic?

    _____

29. Where do they meet?

    _____

30. What role does the clinic play in proving supplies to the CHW's

    _____

The End

Thank you for participating in the interview. I appreciate the time you have taken to answer

Appendix E: Checklist

Checklist for PHC Outreach teams proving maternal and child health services.

Tool to verify the supplies available in the CHW's kit bag (supplies to deliver maternal and child health services).
Date checked: _____

Antenatal Activities	**Supplies needed**	**Available (Y/N)**
Counselling	CHW Checklist	
Breast feeding techniques	CHW checklist	
Follow up visits	MCH record forms	
Referral for early antenatal booking	Referral forms	
Calculate EDD	Pregnancy wheel	
Post-natal Activities		
Breastfeeding techniques	CHW Checklist	
Counselling	CHW Checklist	
Follow up visits to the household	MCH record forms	
Under 5 Activities		
Vitamin A supplementation	Referral forms	
De worming	Referral forms	
Immunization status	Referral forms	
Child under 5 assessment	MCH forms	
Oral rehydration Therapy	CHW Checklist	
Hand washing	CHW Checklist	
Assessment of malnutrition	Tape measure	
Assessment of minor illness	Disposable thermometer	

Appendix F: Antenatal visit data extraction sheet

Data Extraction Tool for Antenatal Visits
Date of data extraction: _____
Data for pregnant women who had a first assessment done during January to June 2013 – data also collected for a 6 month period after the first assessment

Antenatal woman assessed by CHW (study ID No.)	Household Address	Date of Household Registration visit	Gestational Age at Household registration visit	EDD at Household registration visit	Date of 1st ANC home visit	Date of 2nd ANC home visit	Date of 3rd ANC home Visit	Date of 4th follow-up visit	No. Of clinic referrals at any of the ANC home visits	No. Of clinic referrals with referral outcome documented	DOB of Baby

Appendix G: Postnatal visits data extraction sheet

Data Extraction Tool for Postnatal Home visits

Date of data extraction: _____

Data for postnatal women who had a first assessment done during January to June 2013 – data also collected for a 6 month period after the first assessment

Postnatal woman Assessed by CHW (study ID No.)	Household Address	Date of household registration visit	Date and time of 1st home visit after delivery	Date of 2nd Home Visit	Date of 3rd Home Visit after delivery	Date of 4th Home Visit after delivery	Date of 5th Home Visit after delivery	No. of clinic referrals at any of the post natal home visits	No. of clinic referrals with referral outcome documented	DOB of baby

Appendix H: Unimmunized children under five data extraction sheet

Data Extraction Tool for unimmunized children under 5
Date of data extraction: _____

Data for children under 5 who had a first assessment done during January to June 2013 – data also collected for a 6 month period after the first assessment

Child under 5 assessed by CHW (study ID No.)	Date of Household Registration survey done	RTHC checked (Y/N)	Immunizations up to date? (Y/N)	Referred if immunization schedule not up to date (Y/N)	Home visit done within 2 weeks of referral (Y/N)	Child Immunized (Y/N)

Appendix I: Ethics approval

R14/49 Dr Carmen Whyte et al

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M130713

NAME: (Principal Investigator)	Dr Carmen Whyte et al
DEPARTMENT:	Community Health Ekurhuleni Health District
PROJECT TITLE:	Implementation of the Ward Based Primary Health Care Outreach Teams in the Ekurhuleni Health District: A Process Evaluation
DATE CONSIDERED:	26/07/2013
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	M Kawonga/L Thomas
APPROVED BY:	Professor PE Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	13/11/2013

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**.

Principal Investigator Signature

Date 15/11/2013

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES