

**COST AND EFFECTIVENESS OF HIV TESTING AND COUNSELING SERVICE  
DELIVERY STRATEGIES IN NAMIBIA**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT**

**OF THE REQUIREMENTS FOR THE DEGREE OF**

**MASTER OF PUBLIC HEALTH**

**OF**

**THE UNIVERSITY OF NAMIBIA**

**BY**

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**APRIL, 2016**


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## DEDICATION

I dedicate this study to my late grandmother **Magdalena Bobeje** who always encouraged me to pursue my dreams. Her encouragement, love and support throughout my life have been my inspiration to complete many a task. May her soul rest in eternal peace.

Secondly, I would like to sincerely thank my mother **Christina Pietersen** who has been my pillar of strength and inspiration to complete my studies; her unwavering support, concern and love got me through those difficult days.

## ACKNOWLEDGEMENTS

I would like to give my gratitude to the **Almighty God** who gave me the strength, wisdom and good health to be able to conduct my study and complete it.

Thank you to my Research Supervisors, **Dr. L. Haoses Gorases and Dr. S. Kuugongelwa** for their tireless efforts in coaching, guiding and directing me throughout the entire process.

I would also like to appreciate and thank **Dr. N. Taffa, Mr. Micheal De Klerk and Mr. E. Dzinoteyiweyi** for their technical inputs.

Additionally, I would like to thank my Mother, **Christina Pietersen** who has been my rock, my father Mr. S. Pietersen who has encouraged me to complete my studies, my brothers and sisters **Mercia Pietersen, Lionel Pietersen, Benedictus Bobejé, Frankie Vries** for their understanding, patience, cooperation and unwavering support.

I would like to thank my two beautiful little girls, **Angelina and Amor**, who have been my inspiration to complete this course.

I would like to extend my gratitude to the entire MPH Program Staff-UNAM/I-TECH, especially **Ms. Rochelle Van Wyk, the MPH Course Administrator**, for her continuous support throughout my years of study.

I would also like to thank all the HIV testing and counseling partners who have provided their data towards this study.

Lastly, I would like to thank each and every one who assisted me in one way or another to make this research study a success.

## **ABSTRACT**

HIV Testing and Counseling (HTC) remains an important entry to HIV Prevention, treatment, care and support services. According to the Namibian 2013 Demographic Health Survey (DHS), HTC services among 15-49 year old showed a marked increase, with 79% females and 61% males ever tested against the 2006/7 DHS results with 51% and 32% among females and males respectively. However although testing rates have increased the 2015 WHO HIV Testing Services (HTS) Consolidated Guideline indicates that there are still significant gaps remaining in reaching undiagnosed HIV infected people and effectively linking them to treatment, care and support services with efficient use of limited available resources. The purpose of this study was to determine the cost and effectiveness of delivering different HTC service delivery strategies in Namibia to inform program implementation and efficient resource utilization. The HIV Testing and Counseling Strategies under investigation is facility based strategies including Provider Initiated Testing and Counseling, Integrated Voluntary Counseling and Testing and standalone services (Client initiated testing). Community based strategies such as mobile/outreaches to workplaces and national testing day events was also investigated. A retrospective review of HTC service and expenditure records was done for the Namibian Government (GRN) Financial Years 2010/11-2012/13. Data was analyzed using Epi info version 7.

Results indicated that 72% of all HIV tests reported to the Ministry of Health and Social Services (MoHSS) were conducted at Public Health Facilities (PHF). National Testing Day (NTD) and Standalone facilities conducted 15% and 12% of the tests respectively with workplaces recording the lowest proportion of 0.9%. The highest HIV positivity rate of 21% was identified at workplaces followed by PHF with 9% and 5% for NTD.

Workplace had the highest proportion of males tested with 65% and standalone facilities reached the highest proportion of couples tested at 18%. The estimated cost per HIV positive client identified indicated that NTD and PHF recorded the lowest cost with 247 US\$ and 297 US\$ respectively. Standalone and Workplace had the highest cost per positives identified at 718 US\$ for Standalone and 3,791 US\$ for Workplace.

PHF presents the best strategy to reach more clientele at a low cost. PHF have opportunities to maximize this potential with the ongoing expansion of Provider Initiated Testing and Counseling (PITC) in Namibia. If alternative modalities to reduce service costs are applied, workplace HTC services have significant potential to reach men who are hard to reach through mainstream services and are more likely to be HIV positive. Standalone HTC strategies have potential to improve efficiency while strengthening their ability to reach more couples. NTD identified the lowest cost per positive client identified but because of a high number of repeat HTC testers, this approach needs better targeting to find new HIV positive clients. In conclusion this study indicates that PHF reach more clients with HTC and was effective in identifying HIV infected people at a lower cost in Namibia. However, there is a need to complement this strategy with the other service delivery strategies whose efficiency needs to be strengthened in order to remain relevant in contributing to the National HTC Strategy.

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**LIST OF ABBREVIATIONS**

<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>ANC</b>	Antenatal Care
<b>ART</b>	Antiretroviral Treatment
<b>ARV</b>	Antiretroviral
<b>CAA</b>	Catholic AIDS Action
<b>CDC</b>	Centers for Disease Control
<b>DAPP</b>	Development Aid from People to People
<b>FBO</b>	Faith Based Organization
<b>GF</b>	Global Fund
<b>GRN</b>	Government of the Republic of Namibia
<b>HBHTC</b>	Home Based HIV Testing and Counseling
<b>HTC</b>	HIV Testing and Counseling
<b>HFC</b>	Health Facility Census (2009)
<b>HIS</b>	Health Information System
<b>HIV</b>	Human Immunodeficiency Virus
<b>IEC</b>	Information, Education and Communication
<b>IP</b>	Implementing Partner
<b>MOHSS</b>	Ministry of Health and Social Services
<b>MOYNSSC</b>	Ministry of Youth and National Service
<b>MTCT</b>	Mother to Child Transmission of HIV
<b>NABCOA</b>	Namibia Business Coalition on AIDS
<b>NAPPA</b>	Namibia Planned Parenthood Association
<b>NASA</b>	Namibia AIDS Spending Assessment
<b>NDHS</b>	Namibia Demographic and Health Survey

<b>NGO</b>	Non-Governmental Organization
<b>OMA's</b>	Offices, Ministries and Agencies
<b>PEPFAR</b>	President's Emergency Plan for AIDS Relief
<b>PHC</b>	Primary Health Care
<b>PHF</b>	Public Health Facilities
<b>PITC</b>	Provider Initiated Testing and Counseling
<b>PMTCT</b>	Prevention of Mother to Child Transmission
<b>RTD's</b>	Rapid Diagnostic Tests
<b>SRH</b>	Sexual and Reproductive Health
<b>STI</b>	Sexually Transmitted Infections
<b>UNAIDS</b>	Joint United Nations Programme on HIV/AIDS
<b>UNICEF</b>	United Nations Children's Fund
<b>USAID</b>	United States Agency for International Development
<b>VCT</b>	Voluntary Counseling and Testing
<b>WHO</b>	World Health Organization

## **CHAPTER 1 INTRODUCTION AND BACKGROUND**

### **1.1. INTRODUCTION**

This chapter contains the orientation of the study, a statement of the problem, purpose of the study, objectives of the study, the significance of the study, limitations of the study, delimitations of the study and definitions of terms that were prominently used in the study. This paper will report the findings of a comprehensive study to ascertain the cost and effectiveness of HIV Testing and Counseling service delivery strategies in Namibia.

### **1.2. BACKGROUND**

Namibia has a population of 2.104,900 million people and covers approximately 840 000 square kilometers MoHSS (2011) and is also described as the country with the second lowest population density in the world (2.5 inhabitants per square kilometer) which poses significant challenges in delivering health services. According to the Namibia Population and Housing Census (2011), 43% of the population is under the age of 15 and 60 % of the population live in the North Central and North Eastern parts of the country with two thirds of the population living in rural areas. Namibia is also described as one of the countries with the highest income inequalities in the world evidenced by a Gini Coefficient of 0.6 whilst classified by World Bank as a upper middle income country with a Gross national income per capita of US\$8,800 for 2008 with 37% unemployment (MoHSS 2010).

HIV remains one of the biggest public health challenges globally and especially in Sub Saharan Africa and in Namibia. The UNAIDS (2014) fact sheet on Global Statistics indicate that to date 15 million people are accessing antiretroviral therapy (ART) by March 2015, 36.9 million people globally were living with HIV, 2 million people became newly infected with HIV and 1.2 million people died from AIDS related illness. Sub- Saharan Africa has 25.8 million people living with HIV, of which women account for more than half the total number of people living with HIV (UNAIDS, 2014). It is estimated that 1.4 million new infections in 2014 and these new infections account for 60% of the global total of new infections. Namibia has achieved high treatment coverage of 86% using the CD4 count of 350 with 50% decreases in estimated new infections and number of AIDS related deaths (MoHSS 2012/2013).

According to UNAIDS, Namibia remains one of the sub Saharan countries hardest hit by the HIV epidemic. The MoHSS (2013) results of the Demographic Health Survey indicates that the HIV prevalence amongst adults aged 15-49 stands at 14.0% and HIV prevalence is higher among females aged 15-49 at 16.9% and for males at 10.9%. According to the 2013 DHS, HIV prevalence in Namibia peaks in the age groups 35-49 for both females (30.9%) and males (22.6%). The MoHSS(2014) Sentinel Surveillance among pregnant women estimates the National HIV prevalence at 16.9% with geographic variations with the highest HIV prevalence recorded in Katima Mulilo (36%) and Rundu (24.1%) with Opuwo recording the lowest HIV prevalence at 3.9%. Namibia's HIV epidemic is characterized as a generalized, mature epidemic throughout society primarily transmitted through heterosexual means (MoHSS 2012). According to MoHSS (2009) the

key drivers of the epidemic in Namibia are related to underlying social, economic and cultural factors, which include multiple and concurrent sexual relationships and low risk perception of HIV infection amongst others. The National HIV response, to date has seen significant decreases in the number AIDS related deaths and HIV incidence reductions (Spectrum, 2014). The National HIV response is articulated in the national strategic framework outlining all the key strategies including HIV testing.

According to the MoHSS (2010) the Namibia Strategic Framework (NSF) 2010-2017 for HIV and AIDS guides the implementation, coordination, management, monitoring and evaluation of the National Multi-sectorial and decentralized HIV and AIDS response. The overall objective of the NSF is to facilitate improvement of the quality of life, prevent new infections and reduce AIDS related deaths. Furthermore, the NSF Framework has defined national priorities and targets, and articulated prioritized Prevention and Treatment strategies with HIV Testing and Counseling as one of the key priority interventions for the HIV response in Namibia. The NSF articulates a combination of interventions targeting behavioral, biomedical and structural drivers of the epidemic including the rapid scale up of HIV Testing and Counseling services (HTC). Domestic Funding for the HIV response have increased over the years with marked decreases seen in terms donor funding.

The UNAIDS (2013) report showed that the Namibian Government during the financial year 2008/09 funded 45.5% of the nation's HIV response amidst external donors' slow withdrawal from funding the remaining 54.5% in 2008/2009. However according to the MoHSS (2014) Namibia AIDS

Spending Assessment (NASA) report, dramatic increases in domestic funding have been observed which is standing at 64% for the 2013/14 financial year. The NASA report indicates that the spending by Government was the highest in the two periods 2012/13 and 2013/14. In 2012/13 fiscal year spending by government was \$111,050,386 and \$136,620,606 in 2013/14 making up 55% and 64% respectively of total expenditures in both financial periods. This equates to an increase of 23% from the 2012/13 expenditure of \$111,050,386 to 2013/14 expenditure of \$136,620,606.

This increase in domestic funding clearly demonstrates the Namibian Government's commitment to finance the HIV response.

**Table 1.1: HIV Funding sources, MoHSS (2014)**

<b>SOURCE</b>	<b>2012/13</b>	<b>2013/14</b>
<b>Public Funds</b>	55%	64%
<b>International</b>	44%	35%
<b>Private</b>	1%	1%
<b>Total</b>	100%	100%

**Table 1.1** above illustrates the decrease in international funding for HIV and the increase in public funds with only a one percent contribution from the private sector

Although domestic funding levels have increased, the MoHSS (2014) NASA emphasizes the need for a more in-depth spending and cost benefit analysis that would enable the government and partners to invest in programs that yield the highest impact. This means that in line with the MoHSS strategic direction this implies investments made with programmes that help strengthen the identification of new HIV infections. Furthermore the MoHSS



(2014) state that once such studies are done that it would also ensure that data is available to inform future decisions on resource allocation and spending. Resch (2015) investigated the funding of AIDS programmes in the era of shared responsibility: an analysis of domestic spending in 12 low-income and middle-income countries. The study found that nearly all 12 countries studied fall short of the proposed expenditure benchmarks. They further show that if they met these benchmarks fully, domestic spending on AIDS would increase by 2.5 times, from US\$2.1 billion to \$5.1 billion annually, covering 64% of estimated future funding requirements and leaving a gap of around a third of the total \$7.9 billion needed. So this means that even with increases in domestic funding there are still significant gaps remaining to fund the epidemic.

According to WHO (2012) HIV Testing and Counseling remains an important entry for individuals and couples to HIV prevention, treatment, care and support services. It empowers individuals and couples to adopt measures to prevent the transmission or acquisition of HIV infection. WHO further reiterate that without knowledge of HIV status, treatment initiation cannot be realized for HIV positive individuals. Cohen et al (2011) investigated the benefits of immediate versus delayed antiretroviral therapy (ART) initiation in sero discordant couples and the study results indicate a 96% prevention benefit for the HIV negative partner if the HIV positive partner is initiated early and adhered to the ARV treatment. This research gave birth to the concept of Treatment as Prevention which means that at population level if ARV treatment coverage is high HIV incidence is likely to drop. To achieve timely ART initiation and high ART coverage early identification of HIV positive people remains crucial which would require effective HIV Counseling and testing programming. Mgori (2015) investigated HIV and/or

AIDS-related deaths and modifiable risk factors: A descriptive study of medical admissions at Oshakati Intermediate Hospital in Northern Namibia and found that 85% of HIV related hospital deaths were late presenters therefore the ongoing and timely identification of cases remains critical.

Globally, according to UNAIDS (2014) half of all people living with HIV (48%) know their HIV status. In countries with the highest burden of HIV infection, knowledge of HIV status among people living with HIV is higher than before. According to WHO (2015) approximately 150 million children and adults in 129 low- and middle-income countries received HIV testing services in 2014. WHO attributes this growth to the expansion of provider-initiated testing and Counseling (PITC) in clinical settings, the introduction of more community-based HTC and the ability to provide same-day test results, and often diagnosis, using rapid diagnostic tests (RDTs). HIV Counseling Testing in Namibia has increased both in geographic and client coverage as evidenced in the DHS 2013 results. The National Demographic Health survey (DHS) results of 2013 revealed that 61% of males were ever tested and 79% of females were ever tested, which shows a dramatic increase in uptake against the DHS results of 2006/7 with 32% male and 51% females ever been tested for HIV. A higher uptake both for males at 38% and females at 49% has been recorded for the 12 months prior to the survey compared to the 2006/7 DHS results for females 29% and males at 18% respectively. However WHO (2012) cautions that although more people are tested there is about 55% of people with HIV remaining unaware of their status, and testing continues to be delivered without specifically aiming to reach those most at risk and as yet undiagnosed.

Therefore the WHO calls for more efforts to reach undiagnosed HIV positive people who could benefit greatly from the lifesaving anti-retroviral treatment. Therefore Namibia crafted a National Strategy and action plan to reach specific target populations with testing programmes.

Namibia's goal for the HIV testing and counseling programme is to reach out to more people between the ages of 15- 49 years particularly those with undiagnosed HIV infection and aims to successfully link them to treatment, care and support services as per the National HIV Testing and Counseling Strategy 2013/14-2016/17. The National HTC strategy also identified the following objectives:

- To increase the percentage of unwell children aged 0-14 attending health facilities whose HIV status is known to 100% by 2016/17.
- To increase the percentage of adults aged 15-49 attending health facilities who know their HIV status from to 80% by 2016/17.
- To increase the proportion of individuals counseled, tested and receiving results as couples from 10% to 30% by 2016/17.
- To increase the percentage of men aged 15-49 reporting ever been counseled, tested and received results from 32% to 75% by 2016/17.
- To increase the percentage of adolescents and young people aged 10-24
- counseled, tested and received results from 25% to 75% by 2016/17.
- To increase the number of HTC service delivery points for key populations from 8 to 12 by 2016/17.
- To increase the percentage of newly diagnosed HIV positive individuals effectively linked to care and treatment services to 90% by 2016/17

Namibia subscribes to delivering mixed HIV Testing and Counseling service delivery strategies ranging from facility based and community based strategies to reach various target populations. Chapter 2 outlines the key populations reached through various HTC service delivery models. Pietersen et al (2013) concluded that implementation of a mixed HTC service delivery strategies allows for HTC service delivery to different segments of the population in Namibia but also calls for additional research to establish the cost effectiveness of such approaches. WHO (2012), suggests that providing HTC to all who could benefit requires a variety of approaches especially in countries with generalized epidemics. They further contend that one HIV counseling and testing service delivery strategy would not be able to address the different sections of the population adequately. Given the expansion of different HIV Testing and Counseling service delivery strategies the UNAIDS(2012) Global AIDS report highlights the need for HIV Counseling and Testing approaches that are cost effective to achieve maximum impact by identifying people who could benefit from treatment and linking people at higher risk of HIV infection with prevention interventions. Therefore this report indicates that WHO and UNAIDS supports the adoption of a combination of innovative and cost effective HIV Counseling and Testing strategies and therefore advocates for prioritizing HTC approaches that are cost-effective to achieve maximum impact. WHO (2015) contend that with mixed HTC strategies the mix should aim to maximize yield, efficiency, cost-effectiveness and equity.

They further explain that equity does not mean that HIV Testing Services (HTS) should be provided equally across a country or population; rather it should focus HTS on populations at greatest risk for HIV and who are underserved. They further contend that the mix should support timely and complete linkage to prevention, treatment, care and support services for those testing HIV positive.

### **1.3. PROBLEM STATEMENT**

Namibia currently delivers HTC services utilizing mixed HTC strategies. This is done within the context of limited available financial resources to sustain the HIV response as donor funding declines. It is increasingly challenging for the HIV Counseling testing programme to budget effectively. Given the expansion of HTC service delivery strategies over the years no systematic cost and effectiveness analysis has been conducted in Namibia to inform the efficient use of the available limited resources. It is therefore not known which strategies are currently the most effective service delivery in terms of uptake costs and programme outputs such as reaching out to couples, first time testers and in identifying HIV infected people. It is assumed that if that information is known it would help the HTC programme in particular and the MOHSS in general to budget accordingly. Therefore this study seeks to fill that gap and inform policy related to provision of cost effective HTC services in Namibia.

#### **1.4. PURPOSE OF THE STUDY**

The purpose of the study was to determine the cost of delivering HTC services as well as to determine the effectiveness of different HTC strategies.

#### **1.5. SPECIFIC OBJECTIVES:**

- To describe HTC output data across HTC service delivery strategies
- To describe input costs per HTC service delivery strategy
- To calculate and compare the cost per client tested for HIV delivered using different HTC strategies disaggregated by:
  - cost per positive HIV individuals identified for each service delivery strategy;
  - cost per new client tested for HIV infection
  - cost per couples tested

#### **1.6. SIGNIFICANCE OF THE STUDY**

This study will inform policy makers of the Ministry of Health and Social Services on ways to improve the efficiency of HTC service delivery. The ability to target HTC modalities to appropriate population groups may optimize the effectiveness of testing programs in terms of increasing uptake, reaching high-risk populations, and creating successful linkages to HIV prevention, treatment and care services. Furthermore, the results of this study will close the literature gap that currently exists on a systematic cost and effectiveness analysis of the HIV Testing and Counseling programme service delivery strategies in Namibia.

### 1.6.1 Definitions of Key concepts

- **Client Initiated Counseling and Testing:** - Client-initiated Counseling and testing involves individuals, couples, or families actively seeking HCT in a setting that offers these services. (MoHSS, 2011).
- **Cost – Effectiveness Analysis (CEA):** Used for health care planning and evaluating HIV interventions by comparing the net monetary costs of an intervention with a measure of health impact or outcome (Paxton A, Carvalho N, 2013).
- **Cost Effectiveness for HIV Testing and Counseling:** WHO (2011) define cost-effectiveness of HIV Testing and Counseling that are measured by the number of infections newly identified for the number of tests performed.
- **Couples:** WHO (2012) defines couples as two persons in an ongoing sexual relationship; each of these persons is referred to as a “partner” in the relationship.
- **Generalized HIV epidemics:** HIV prevalence is consistently over 1% in pregnant women. (WHO 2007).
- **HIV Testing and Counseling (HCT) :** HCT is defined as a service that is offered to clients who wish to know their HIV status. HIV Counseling is a confidential dialogue between a counselor and an individual, couple or family. The common components are pre- test, testing, post-test and ongoing support (MoHSS, 2011).

- **Key populations** : are defined as those populations at higher risk of HIV (those populations disproportionately affected in all regions and epidemic types, specifically sex workers, men who have sex with men, transgender people and people who inject drugs (WHO, 2013)
- **Lay provider**: any person who performs functions related to health-care delivery and has been trained to deliver specific services but has not received a formal professional or paraprofessional certificate or tertiary education degree (WHO ,2015)
- **Provider Initiated HIV Testing and Counseling**: Provider- initiated HCT means that health care workers recommend HIV testing to patients as part of routine health care services.(MoHSS, 2011).
- **Rapid diagnostic test (RDT)**: in vitro diagnostic of immunochromatographic or immunofiltration format for, in the case of HIV diagnosis, the detection of HIV-1/2 antibodies (WHO,2015).
- **Retesting**: There are certain situations in which individuals should be retested after a defined period of time: (1) HIV-negative people with recent or on-going risk of exposure, (2) people with an HIV- inconclusive status and (3) HIV-positive people before they enrol in care or initiate treatment. (WHO, 2015)
- **Serodiscordant couple**: A serodiscordant couple is a couple in which one partner is HIV-positive and one partner is HIV-negative (WHO, 2011).



- **Strategy:** According to the Oxford Advanced Learner's Dictionary a strategy is a plan of action designed to achieve a long-term or overall aim.
- **Testing algorithm:** the combination and sequence of specific assays used within HIV testing strategies (WHO, 2015).

### **1.7 CONCEPTUAL FRAMEWORK FOR DATA ANALYSIS:**

WHO (2011) provides a framework for understanding HIV Testing and Counseling service delivery strategies which is divided in two broad categories namely community based and facility based strategies.

### **1.8 ETHICAL CONSIDERATIONS**

Permission to conduct the study and ethical approval was granted by the University of Namibia postgraduate committee and also by the MoHSS research committee prior to the commencement of the study as indicated in Annexure A, B and C respectively. To protect the identity of clients de identified data was utilized for the purpose of the study.

### **1.9 SUMMARY**

HIV Testing and Counseling (HTC) remains an important entry to HIV Prevention, treatment, care and support services is identified in the National Strategic Framework as one of the priority interventions in Namibia's HIV Response. Namibia implements mixed HTC strategies including Facility based: Public Health Facilities and Standalone VCT centers as well as various community based approaches including Home based testing, School Based testing, Workplace testing and testing

campaigns. Donor funding declines have been experienced however remarked increase in Government funding to the HIV response is also observed with 64% at present. However literature also indicates that there may still be funding gaps and therefore indicate that there is a global call for cost efficient utilization of resources hence the call for HIV programmes to conduct cost efficiency studies to determine any cost savings and achieve more with fewer resources. Therefore this study seeks to investigate these HTC programme service delivery strategies in terms of uptake costs and programme outputs such as reaching out to couples, men and first time testers and in identifying HIV infected people. The next chapter will discuss the literature and conceptual framework related to the provision of HIV Counseling and Testing Service delivery.

## **CHAPTER 2**

### **LITERATURE REVIEW AND CONCEPTUALISATION**

#### **2.1. INTRODUCTION**

Effective research is based on past knowledge. Therefore literature reviews provide useful hypotheses and helpful suggestions for significant recommendations for significant investigation. This study will therefore be conducted with this in mind, thus the literature provided (Best and Kahn 2006). This chapter briefly discusses the literature related to this research and also describes the different HTC delivery strategies and conceptual framework. These strategies include facility based testing approaches including Provider Initiated Testing strategies, Client Initiated testing strategies delivered at Public Health Facilities as well as New Start standalone VCT centers. Additionally community based strategies including mobile/outreach testing to workplaces and national testing day campaigns. Key words include; Public Health Facilities, Workplace testing, Standalone New Start and National Testing days.

#### **2.2. BACKGROUND HIV TESTING AND COUNSELING**

HIV Testing and Counseling (HTC) is described by the WHO and others as the “gateway” to other treatment, care, support and prevention services. According to MoHSS (2011) HTC is defined as a service that is offered to clients who wish to know their HIV status. The guidelines further indicate that HIV Counseling is a confidential dialogue between a counselor and an individual, couple or family and the common components are pre-test, testing, post-test and ongoing

support. According to WHO (2012) most people with HIV do not know that they are infected; they indicate that population surveys in 2007–2008 in low- and middle-income countries revealed that knowledge of HIV status is still low among people with HIV, with a median of 40% in 10 countries (12) and those who do know often test late; and poor linkages from HTC to care mean that many people start antiretroviral therapy (ART) when they are already significantly immune compromised, resulting in poor health outcomes and ongoing transmission. They contend that a successful public health response to HIV requires robust HTC services however it remains imperative to ensure successful linkages to HIV care and treatment. Therefore WHO indicate that the value of HTC depends on linking people to services that are acceptable, accessible and effective.

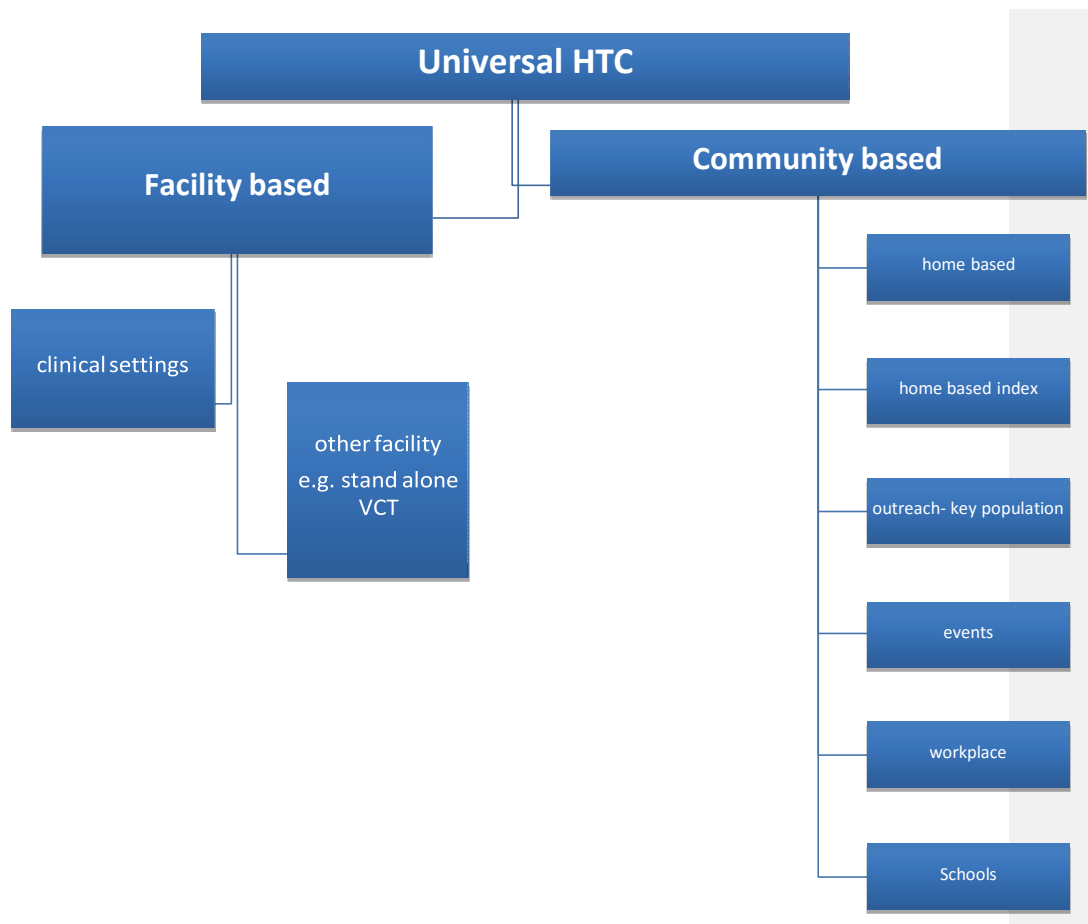
According to Paxton and Carvalho (2013) HIV testing and Counseling (HTC) is recognized as an essential entry point for initiating care and treatment for those who are infected with HIV. It can also be linked to other prevention services, including male circumcision, prevention of mother-to-child transmission of HIV, and enhanced prevention support for sero-discordant couples. Paxton et al (2013) further indicate that it has become increasingly important to define the role that HTC can play in the overall response to HIV and AIDS and more importantly which mix of service delivery modes is most strategic, and the drivers of the unit costs per service delivery strategy. They further contend that once the most strategic mix and drivers of unit costs is known, policymakers and program managers can guide decision-making processes toward the pursuit of cost effective, quality HTC service delivery modalities that

can potentially expand coverage, especially among key populations, and get people into treatment at an earlier stage of infection.

### **2.3 HTC SERVICE DELIVERY STRATEGIES**

WHO (2011) recommends a rapid scale up of alternative community based strategies in HIV Testing and Counseling service provision besides facility based HTC services to ensure equitable access to such services given the country's epidemic, cost effectiveness of HCT approaches and available resources including the provision of same day results. WHO (2011) provides the following framework for understanding HIV Testing and Counseling service delivery strategies which is divided in two broad categories namely community based and facility based HIV Testing and Counseling service delivery strategies:

**Figure 2.1: WHO (2011) HIV testing and Counseling Strategies Framework**



*α. In the index strategy, HIV testing and Counseling is offered to the household members of an individual with HIV or TB, also known as the index patient.*

### **2.3.1. FACILITY -BASED HIV TESTING AND COUNSELING**

In clinical settings HIV Counseling is primarily characterized by the Provider Initiated Testing and Counseling approach and in some instances an integrated Voluntary Counseling and Testing approach. Other health facility based approaches outside clinical settings includes the VCT standalone centers.

### **2.3.1.1. PROVIDER INITIATED TESTING AND COUNSELING (PITC)**

WHO (2007) defines Provider –initiated HIV testing and Counseling as HIV testing and Counseling which is recommended by health care providers to persons attending health care facilities as a standard component of medical care. The major purpose of such testing and counseling is to enable specific clinical decisions to be made or specific medical services to be offered. This approach is especially recommended by WHO for countries with generalized epidemics. WHO(2007) further state that although health facilities represent a key point of contact with people with HIV who are in need of HIV prevention , treatment and care support many opportunities to diagnose and counsel individuals at health facilities are missed. WHO (2012) indicates that implementation of PITC has been limited in many countries but has been successfully implemented in Anti Natal Care (ANC) and TB settings. They further explain that coverage levels are high in ANC settings because of supportive policies by many countries in which they prioritized the routine offer of HIV testing whereas some sections such as inpatients and outpatients departments of the health facilities do not prioritize HTC and therefore PITC is often low in those settings. WHO (2015) indicate that PITC is less often offered in clinical settings, even in high burden countries and describe it a major missed opportunity. In general clinical settings, PITC can have high rates of uptake and of new diagnoses.

Roura et al. (2013) conducted a review of studies in Sub Saharan Africa related to the implementation of Provider initiated approach and their findings show that the routine offer of an HIV test during patient–provider encounters is gaining momentum within HIV treatment and prevention

programmes. They contend that the widespread adoption of PITC for HIV provides an unprecedented opportunity for identifying HIV-positive individuals who are already in contact with the health services, with the introduction of PITC in diverse settings, the uptake of HIV testing has increased remarkably.

However the study indicate that there are substantial missed opportunities related to implementing the policy, with wide variations in the rates of acceptance of the test and high proportions of individuals failing to access subsequent HIV treatment and care services as well as failing to access further screening for conditions such as STI's or TB. They further recommend that, to reap the expected health benefits, PITC programmes should incorporate measures aimed at strengthening health systems and fostering the normalization of HIV at community level.

PITC has been implemented in Namibia in particular for pregnant women attending antenatal care services (ANC) at public health facilities as well patients diagnosed with tuberculosis (TB) as part of the services offered. PITC has traditionally been offered at public health facilities however this approach can also be utilized in community settings. According to the MoHSS (2013) report Namibia continues to see high uptake of HIV testing services by pregnant women attending ANC services with 90% reported for the period 2013/14 and 84% TB patients tested. PITC services are currently offered at public health facilities especially at clinics for pregnant women



attending ANC.

Davyduke et al (2015) investigated enablers and barriers to the uptake of provider-initiated testing and counseling for HIV (PITC) in Namibia and opportunities for strengthening provider-initiated testing and counseling for HIV in Namibia. This study found that PITC in Namibia was largely delivered by lay counselors operating in designated rapid testing rooms located in health facilities and found a large number of missed opportunities for HIV testing through this model. They also found that nurses did not see it as PITC as an integral part of their role. Nurses also indicated that they were not aware of HIV testing and counseling policy and felt inadequately trained and supported amidst staffing shortages.

Therefore the study recommends wider dissemination and implementation of policy, increasing privacy of consultation spaces and community sensitization are simple measures that represent opportunities for strengthening this response and ensuring that symptomatic individuals who are unaware of their HIV status do not fall through the net. HIV testing and counseling have been task shifted from the nurses to lay counselors since 2004 to address the need for a dramatic increase in quality counseling and testing services with the introduction of the ART and PMTCT programmes in 2004 (MoHSS 2004). Pietersen et al (2009) concluded that high quality services can be rendered by lay counselors provided that they have adequate training and supervision.

### **2.3.1.2 INTERGRATED VOLUNTARY COUNSELING AND TESTING**

Integrated voluntary Counseling and testing (VCT) is defined by WHO as VCT which is integrated into clinical settings. This approach allows for clients/patients who wish to be tested in clinical settings to have access to such services which means patients actively requests for HIV testing services as opposed to PITC where an offer for HIV testing is made by the provider to patients attending a health facility. WHO (2011) indicate that these VCT services have proved acceptable and effective in some clinical settings to support access to testing and to HIV prevention and treatment services however, the preferred strategy in clinical settings is to offer a more integrated routine approach (PITC).

### **2.3.1.3 OTHER FACILITY BASED TESTING: STANDALONE VCT CENTERS**

Stand-alone sites are usually situated in the community and is thus more accessible to their target populations than health-care facilities. They often offer the more comprehensive counseling, same-day results, staffing, and linkages typical of community-based services. According to FHI (2005) stand-alone sites, also known as freestanding sites, are generally operated by nongovernmental organizations (NGOs) and are not associated with medical institutions. They continue to explain that with a client-initiated approach importance of voluntarism and informed consent and established standards for the ethical conduct of HTC is stressed. This strategy conventionally has consisted of three primary components: individual pre- and post- test Counseling, written informed consent, and measures to protect confidentiality. This HIV testing service delivery makes use of the Client

Initiated Approach which is defined by WHO (2012) as involving individuals actively seeking HIV Testing and Counseling at a facility that offers these services. WHO (2011) indicate that the target populations for this approach includes the general population and can also be accessible for key populations.

Namibia introduced the client initiated approach or voluntary counseling and testing approach in 2004 with the introduction of New Start Centers franchise model. Since the rapid expansion of testing services in public health facilities, the number of New Start Centers has been decreased to only five Centers. These New Start Centers are situated in Windhoek: Central Business District and Council of Churches New Start Center, Rundu New Start Center, Tonateni New Start center in Oshakati and the Oshikango New Start Center. These New Start centers are implemented by various Faith Based Organizations and NGO's and are funded mainly by the Presidents Emergency Plan for AIDS relief (PEPFAR) through USAID. Since 2010 the VCT centers have been provided with HIV Rapid Testing commodities including HIV rapid tests and supplies by the Namibian Government.

### **2.3.2 COMMUNITY BASED HIV COUNSELING AND TESTING**

WHO (2012) indicates that Community-based strategies offer “**great potential**” to reach people and places not previously served as well as identify infections earlier. These approaches would include Home Based HTC, Mobile/Outreach, Testing Campaigns and School Based HTC. A recent systematic review and meta-analysis of community-based approaches found that community-based HTC approaches were successful in reaching populations early in the course of HIV infection and that earlier HIV

diagnosis supports timely access to ART, which could improve life expectancy and reduce HIV transmission (Suthar et al 2013). The latest WHO (2015) guidelines on HIV Testing and Counseling Services indicate that Community-based HTS include a number of approaches – door-to-door/home-based testing and mobile outreach campaigns and testing in workplaces, parks, bars, places of worship and educational establishments. They further contend that it is an important approach for increasing early diagnosis, reaching first-time testers and people who seldom use clinical services, including men and adolescents in high prevalence settings and people from key populations in all settings. According to the MoHSS (2012) Namibia have been implementing various community based HTC service delivery strategies including National Testing Days (NTD), Home Based HIV Testing and Counseling (HBHTC), workplace testing , Mobile/Outreach testing and school based HTC.

#### **2.3.2.1 HOME BASED HIV TESTING AND COUNSELING**

WHO (2012) defines Home-based HIV testing and Counseling (HBHTC) as HIV testing and counseling (HTC) services conducted by trained HTC service providers in someone's home. They describe the main purpose of HBHTC as HTC services brought to households and contend that it will overcome some of the barriers of access to testing services and providing testing to persons who might not otherwise seek services according to WHO (2012). WHO (2011) cites a study conducted in Kenya which showed that people who were diagnosed as HIV-positive through Home based HIV testing and Counseling had significantly higher median CD4 cell counts when entering HIV care than those who tested positive through other points of entry. This implies that antiretroviral therapy can be initiated in a timely manner; in this context provided that the referral and linkages to Treatment,

Care and support is strong. This study continues to support the notion that earlier identification makes possible earlier treatment, which in turn yields better treatment and prevention outcomes. Home Based HCT has three approaches namely the Door to Door approach, Index patient approach and self-testing, that are described in more detail below. WHO indicate that this strategy is suitable for general population (if door-to-door) or partners, parents, children, other household members of known or suspect HIV or TB index patients, provided consent has been obtained from the index-patient.

#### **2.3.2.1.1 DOOR TO DOOR HIV TESTING AND COUNSELING**

The door-to-door strategy refers to an approach that aims for high coverage of services within a specific community or geographic location. The primary objective of a door-to-door strategy is to offer HTC to every eligible resident of every homestead or household (WHO, 2012). According to WHO (2012) benefits of this approach include the potential to reach more men, children, and couples as compared to traditional voluntary Counseling and testing (VCT) and provider initiated testing and counseling (PITC) in health facilities and it helps to reach marginalized groups, such as disabled people.

Namibia has implemented the Door To Door approach since 2011. According to the Home based HTC Evaluation report (DAPP, 2013) Namibia piloted Home based HIV Testing and Counseling the Door to Door approach in two regions namely Oshana and Kavango Regions respectively. According to the evaluation report (DAPP, 2013) the results from the pilot have shown increased proportion of males tested, couples and first time testers and that this approach is feasible for implementation in Namibia. This approach has now been scaled up to six more, high burden (high HIV prevalence) and densely populated regions. This approach is implemented by the following

community based organizations namely: Development AID from People to People (DAPP) also known as Total Control of the Epidemic (TCE) in the following six regions Oshana, Ohangwena, Oshikoto, Omusati, Zambezi, Kavango and Khomas regions respectively and Catholic AIDS Action who is operational in Erongo Region. The Door to Door HTC service providers are receiving HIV Rapid Testing kits from the Namibian Government.

#### **2.3.2.1.2 INDEX PATIENT HIV TESTING AND COUNSELING**

WHO (2012) defines the index-patient strategy (sometimes referred to as ‘targeted testing’) as HTC service providers visiting the homes of people diagnosed with HIV or TB and offering HTC to their sexual partner(s) and other family members. One of the major benefits of this approach is that it can target testing of people at high risk for HIV as well as it may facilitate detection of high numbers of HIV-positive people and linking them to treatment and care (WHO 2012). Namibia has not implemented this approach yet.

## **2.4 SELF TESTING**

WHO (2013) indicate that Home-based self-testing may increase universal access to HTC, addressing the desire for convenience and confidentiality. According to WHO (2012) three main approaches are being explored: firstly, self-testing programs specifically secondly targeting health workers and their partners, and finally marketing of self-testing kits through registered vendors (such as pharmacists or chemists), and supervised distribution of self-test kits through community-based programs. WHO (2015) indicate there is little

experience with community-based self-testing, and as such, scale-up of this strategy from research to broader community access –will require an evidence-base both to optimize delivery and referral systems and to design strategies to minimize adverse effects and maximize positive social impacts. The meeting report of first International Symposium on HIVST consensus statement by Baggaley et al (2013) indicate that HIV Self-Testing (HIVST) has potential to increase access to testing and meet the needs of general populations and health workers in high prevalence settings, individuals in sero discordant relationships and other priority populations in all settings. They further recommend that countries should actively explore HIVST as a complementary strategy to increase knowledge of status and uptake of prevention, care and treatment and that National testing algorithms should be adapted to incorporate HIVST, regulate markets, assess accuracy and facilitate further testing following self-testing. They also however caution that the use of RDTs for HIVST requires a regulatory framework that ensures quality diagnostics that give accurate results in the hands of the intended users. They also recommend that consideration of ethical, human rights and legal issues is required. Assessment of Over-the-Counter HIV Rapid Test Kits in Namibia was conducted by Nersesian et al (2013) and found that the desk review found that current Namibian regulatory documents and HIV guidelines do not address HIV self-testing or HIV RTKs sold over the counter at pharmacies explicitly. However, HIV RTKs fall under the regulatory framework for medical devices. Most pharmacies operate within the private sector in Namibia. AIDSTAR-One conducted surveys in 53

private pharmacies (47 percent of the total). 68 percent of those surveyed reported selling HIV RTKs over the counter. Fifty percent of those began selling the kits in 2012. AIDSTAR-One provides recommended actions for next steps regarding the sale of HIV RTKs over the counter at private pharmacies in Namibia, including putting in place appropriate policies, guidelines, and regulations; exploring task-shifting for HCT; ensuring community engagement; establishing authorized private sector distributors; and addressing ethical considerations. Further, AIDSTAR-One identifies recommended future research on HIV RTKs sold over the counter in Namibia.

## **2.5 MOBILE/OUTREACH TESTING**

According to WHO (2011) Mobile/ Outreach HTC can be offered in a variety of settings in the community, either as outreach to community sites or through mobile vans or tents. MoHSS (2011) define outreach HCT as services offered outside of fixed sites such as utilizing health facilities with spare rooms but no HCT provision and utilizing pre-existing community facilities such as a church, school, university, or market building and using tents as Counseling rooms. Outreach HCT can be conducted at night to reach working populations, including taxi and truck drivers and sex workers who are more available for HCT at night which is also called “Moonlight HCT”.

This strategy of testing may set up services temporarily, but perhaps regularly, in community sites such as churches or other faith settings, places of entertainment such as bars and clubs, or schools or workplaces, and it may be linked to events, such as sporting, music, theatre, or agricultural events.



According to WHO (2011) the mobile testing approach show higher testing uptake, especially among younger clients as well as reaching a higher proportion of individuals who are not aware of their HIV status as compared to facility based testing. Outreach HTC services provided in community settings aim to improve access to and coverage of HTC services among rural and marginalized populations underserved by the formal health care system.

### **2.5.1 WORKPLACE AND EDUCATIONAL ESTABLISHMENT-BASED TESTING AND COUNSELING**

WHO (2011) defines workplace testing and school based testing as HTC services in a workplace or school which seek to serve individuals—in many contexts mostly men—whose formal employment or school commitments make it hard to go to health facilities and therefore a mobile/ outreach approach is best suited to reach men. Corbett et al (2006) investigated the uptake of workplace HIV Counseling a cluster randomized trial in Zimbabwe which found an HIV prevalence of 19.8% and 18.4% and they also concluded that VCT at the workplace offers potential for high uptake when offered onsite and linked to basic HIV care. They further contend that the element of convenience and accessibility appear to have critical roles in the acceptability of community based VCT. The study also found that periodic outreach VCT may be almost as effective as providing a continuous service.

In Namibia workplace testing is primarily offered through the Namibia Business Coalition on AIDS (NABCOA) now known as Health Works Namibia as per mandate stipulated in the National Strategic Framework for HIV and AIDS (2010) as well as the Medium Term Plan for HIV. NABCOA offers HIV testing services as part of a wellness package and as a standalone

service. They primarily offer HIV testing through a Mobile/Outreach approach and operate in all corners of the country as per company requests. Workplace testing is also done at all military bases however these data are not readily available.

### **2.5.2 SCHOOL-BASED TESTING**

According to WHO (2011) School Based Testing addresses sexually active youth, typically individuals ages 12 or 13 and older. This effort is intended to provide early access to treatment, care and support services for adolescents who test HIV-positive and to HIV prevention services for individuals who test HIV-negative. WHO (2015) indicate that sub-Saharan Africa adolescents (10–19 years of age) are less likely than adults to be tested, to obtain care, to remain in care and to achieve viral suppression. Statistics show that between 2005 and 2012 the number of HIV-related deaths among adolescents increased by 50% (32). Based on Demographic and Health Surveys and Multiple Indicator Cluster Surveys from 2008 to 2012 in the WHO African Region, less than one of every five girls ages 15–19 years were aware of their HIV status. They further indicate that because uptake of HIV testing among adolescents is low and services for adolescents are of poor quality or in many settings have not yet been developed, there is often little support for adolescents to overcome barriers, adhere to treatment and stay in care. To find this particular target group Namibia piloted School Based Testing in 2014 at 16 Secondary Schools in the Oshana and Omusati Regions. This pilot was done in conjunction with Ministry of Education with technical support and financial support from UNICEF and DAPP Namibia. According to UNICEF (2014) the pilot results showed a high uptake of HTC among learners with more than 60% testing as first time testers.

This evaluation has demonstrated that providing HTC in schools can increase uptake of testing amongst adolescents and youth and that a computer tablet is an excellent tool to motivate adolescents and youth to take up the test. The cost analysis that the highest calculated cost per test would be USD76.50 and the lowest USD17.40 which is seen within the normal ranges of cost per client tested (UNICEF, 2014). The National Steering committee is in the process to discuss the way forward for this approach.

### **2.5.3 TESTING CAMPAIGNS**

WHO (2011) indicates that a number of countries have organized national campaigns to encourage HIV testing, increase knowledge of HIV status, and facilitate referral to treatment and prevention services. In the implementing countries where this approach was followed showed a “greater-than-expected increase” in the number of people seeking to know their HIV status. The Malawi experience is highlighted in that with their three consecutive annual one-week campaigns (2006–2008) positive responses resulted in reaching more than double the targets as in the case of the Namibian experience. According to WHO given evidence gathered countries that implemented this strategy have created an enabling environment in normalizing HIV Testing as well as reaching higher numbers of clients especially from remote, underserved areas.

National Testing Day has been implemented in Namibia since May 2008 until 2012. According to the (MoHSS, 2012) this strategy aimed to create more awareness amongst the general population on HIV Testing services and to provide more opportunities for people to be tested more especially after hours and over weekends at certain hotspots. A National Steering Committee

was established which included all HIV Testing and Counseling National partners and was primarily funded by PEPFAR (Centers for Disease Control in Namibia and USAID) and the Global Fund. The Testing days ranged from 3 days- 1 day events over the years. Incentive or overtime allowances have been paid to staff working after hours during National Testing days. The National Testing Day has since been discontinued to focus on specific regions and certain target populations that are underserved with the other service delivery strategies. HIV Testing services during NTD's were offered at all public Health facilities including designated outreach points.

## **2.6 TARGET POPULATIONS: HIV TESTING AND COUNSELING SERVICE DELIVERY STRATEGIES**

According to WHO (2011) the table below which is adapted for the purpose of this study can help countries determine which HTC delivery strategy that may be most appropriate based on local epidemiological context or populations that are key and, therefore, need to be targeted specifically.

**Table 2.1: Target populations for HIV Testing and Counseling service delivery Strategies**

Strategy of HTC Delivery	General Epidemic	Men	Young people <24 years	MSM	SW	Rural	Urban
VCT (Standalone VCT)	xx	x	x	-	-	NR	x
PITC	xx	x	Not required	x	x	-	x
Door to Door HBC	xx	xx	xx	-	--	xx	x
Index Patient : HBC	xx	xx	xx	--	-	xx	x
Mobile/Outreach	x	xx	xx	xx	xx	xx	x
Workplace	x	x	Not required	-	-	x	x

**MSM = men who have sex with men;** According to WHO (2011) the ratings provided for each category are based on a review of published and unpublished literature and the experiences of programme.

### Key

- **X:** Recommended. For Conditions for implementation: Required.
- **XX:** Highly recommended and should be considered a key strategy. For Conditions for implementation: Highly required.
- **Not Required (NR):** Not considered effective in this context/for this population. For Conditions for implementation: Not required.
- Where no symbol appears, there are insufficient data or experience.

WHO (2011) indicate that these strategies as shown in table 2.1 above are mutually reinforcing and complementary, with each model of delivery addressing specific populations that are a priority within distinct epidemic types. The strategic expansion of HTC should involve a combination of these strategies of delivery. They contend that each model should be implemented strategically, where it will most effectively increase coverage and uptake by populations that are not making use of currently available services. According to WHO (2015) key priority populations include adolescents, couples, children, men, pregnant women and key populations (Men having sex with men, Commercial sex workers). The following priority populations discussed below relates to the study and more so the priority populations according to Namibia's National HTC Strategy.

### **2.6.1 TESTING MEN**

WHO (2015) HIV Testing and Counseling Guidelines indicate that in high prevalence settings fewer men than women report ever testing for HIV and therefore they contend that as a consequence men are more likely to start ART at later stages of HIV infection and thus experience higher morbidity and mortality after starting ART therefore they recommend that greater emphasis on reaching men is required in many high prevalence settings. WHO (2015) further contend that the lower HTC uptake of males is because HTC is conducted mainly in reproductive health services, including antenatal care (ANC), where the routine offer of HIV testing is generally the norm. Therefore it is recommended that additional approaches are needed to increase uptake of HTS among men, including the provision of HTC in settings that are more appropriate and acceptable to men, and to devise ways to encourage testing of male partners in high prevalence settings and of

couples and male partners of women with HIV in all settings. Although testing uptake of men ever tested in Namibia significantly increased as per DHS results 2013 61% from 31% in 2006/7 much still needs to be done to find men and test them timely.

### **2.6.2 TESTING COUPLES**

WHO (2015) indicate that in most countries the proportion of couples and partners who test together is less than 20% and that the prevalence of sero discordance is estimated at one-half to two-thirds of cohabitating couples or partners where one partner has HIV yet they contend that many people do not know their partner's HIV status. Cohen et al (2012) indicate that if the negative partner in a sero discordant relationship is immediately initiated on ART treatment, there is a 96% prevention benefit for the negative partner in reducing risk of HIV infection by the HIV positive partner. Therefore identification of HIV sero discordant couples remains a key priority for HIV Testing and Counseling programming. WHO, UNAIDS (2011) recommends the increased offering of couples HIV testing and Counseling in generalized epidemics. According to the 2013 DHS couples tested show that only 25% of individuals were tested as couples and that there is a 13% discordance rate amongst those tested as couples. The DHS 2013 highlights that couples testing uptake is low in all regions of the country however majority of clients responded that they are willing to get tested as couples.

### **2.6.3 TESTING NEW CLIENTS**

WHO (2012) indicate that to expand the number of people who know their HIV status, programmes should prioritize first-time testing and set targets for it. However they further indicate that retesting should remain readily available for those at continued risk of infection, as are many people in key populations.

## **2.7. HIV TESTING AND COUNSELING SERVICE DELIVERY STRATEGIES: COST AND EFFECTIVENESS**

### **2.7.1 INTRODUCTION**

This section outlines the theories on economic evaluations and highlights some cost effectiveness studies especially in the area of HTC programming as well as literature regarding cost effectiveness of HTC service delivery strategies.

Paxton et al (2013) indicate that for countries to have the greatest impact in averting new HIV infections and preventing AIDS-related deaths, it is essential that policymakers and program planners make optimal use of available resources. They contend that financial investments in HIV care and prevention need to be both efficient and effective. To this end, they contend that policymakers have placed new emphasis on evaluating the efficiency of HIV programs and services. They further reiterate that these efforts require timely and accurate data on the cost and cost-effectiveness of programs and services. Zeng et al. (2012) conducted an evaluation of National HIV/ AIDS programs in transforming funding into services and they also wanted to identify determinants of their efficiency in 68 low and middle income



countries. The results of this study show that the average efficiency in implementing HIV/AIDS programs was moderate (49.8%). Their study concluded that there may be substantial opportunity for improving the efficiency of AIDS services, by providing more services with existing resources.

Paxton et al (2013) further defines economic evaluation (EE) is a set of research techniques that systematically and objectively collect and calculate the costs and outcomes of health interventions. They contend that it can help identify which investments will yield the best results in terms of reaching more people with services, or better target services to reach the right populations and make the greatest impact. The four main types of economic evaluations: 1) cost analysis, 2) cost-effectiveness analysis, 3) cost-utility analysis, and 4) cost-benefit analysis. Each method includes explicit measurements of inputs (costs) and outcomes (benefits), but they differ in the way in which the health outcomes are valued. They explain that a cost analysis – involves determining the costs of interventions, allowing program planners to calculate budgetary requirements and determine whether an intervention is affordable, and to understand the current and future cost requirements of a program. The results of a cost analysis are often expressed as a total program cost and/or a unit cost (cost-per-patient or cost-per-encounter, for example). Cost analysis is the basis for other economic evaluations, and the technique is consistent for each evaluation type. They contend that HIV programs can differ dramatically depending on the nature of the intervention. Paxton et al (2013) continue to explain that by analyzing the unit costs identified as critical inputs for service delivery, the planner can identify “cost drivers” (aspects of the program that require the most resources), which can help identify potential cost savings through increased efficiencies in the future.

They further content that this information can help program planners understand whether it is prudent to continue a program or service, and/or cost-effective ways to expand the program or service.

Cost effectiveness is described by Paxton et al (2013) as analysis: to compare interventions with similar outputs. The outcomes measured in this approach is expressed as the Cost per program outcome(infections averted, patients successfully treated, etc.) and the application of this economic evaluation is expressed as evaluating interventions by combining project costs and outcomes and comparing interventions with similar goals. WHO (2011) describes cost effectiveness for HIV Testing and Counseling approaches as measured by the number of infections newly identified for the number of tests performed. WHO (2015) indicate that cost estimates and budgets can now be informed by actual expenditure analysis, not only at the national level but even at the site or facility level. They recommend that countries use all available data, as well as tools for analysis and mapping, to help inform strategic decision-making. This includes decisions about how to maintain wide coverage of essential testing services, such as for pregnant women and clients with TB and STIs, as well as how to increase focused coverage for populations at high risk and for groups previously underserved.

### **2.7.2 HIV TESTING COUNSELING AND TESTING COST AND EFFECTIVENESS PUBLISHED STUDIES**

According to the UNAIDS (2012) Global AIDS report there is limited published data on the costs of various HTC strategies. This report indicates that traditional Voluntary Counseling and Testing may be a more expensive strategy than other community based approaches and provider initiated testing. Outlined below are some studies cited which aims to determine cost effectiveness of various HTC strategies. WHO (2015) indicate that in addition to the health system, local context, epidemiology, current testing coverage and available financial and human resources and what the intended clients want, will determine the appropriate mix of HTS approaches to reach populations at high risk and geographic areas with largely undiagnosed HIV infection. In addition to the factors mentioned above FHI (2005) indicate that in choosing the best HTC service delivery strategy to deliver the programme goals should also be considered.

Factors which could affect effectiveness and cost of delivering HIV Testing services include health system, local context, epidemiology, current testing coverage and available financial and human resources and what the intended clients want, will determine the appropriate mix of HTS approaches. Additionally, this could include the provision of same day testing results as opposed to lab based ELISA testing.

Obure et al. (2012) investigated the cost efficiencies between PITC services versus VCT services in low resource settings in Kenya and Swaziland with a high HIV prevalence and concluded that there may be potential for substantial gains in efficiency in the provision of HTC services.

This study concluded that the cost per client and per person testing HIV positive is lower for PITC than VCT across all facility types in Kenya with an average cost per client for PITC ranged from US\$4.81 - US\$6.11. The results for Swaziland indicate that the average cost for PITC ranged from US\$6.92 to US\$13.51. The average cost per client for VCT ranged from US\$5.05 to US\$16.05 in Kenya and US\$8.68 to US\$19.32 in Swaziland. Obure et al (2012) therefore recommend that considerations of how to deliver services efficiently need to be informed by local contextual factors, such as prevalence, service demand and availability of human resources. De Beer et al(2015) investigated the cost of mobile voluntary counseling and testing at the workplace versus facility based voluntary counseling and testing in Namibia. The study results show that in 2009, the average cost per person tested for HIV at the Bophelo! mobile clinic was an estimated US\$60.59 (US\$310,451 for the 5124 people tested). Private employer contributions to the testing costs reduced the public cost per person tested to US\$37.76. They further found that the cost of testing one person for HIV in 2009 at the New Start centers was estimated at US\$58.2. They concluded that mobile clinics can provide cost-effective wellness testing services at the workplace and have the potential to mobilize local private funding sources.

In contrast another study conducted to determine the cost effectiveness of four HIV Testing and Counseling strategies (Standalone, Health Facility Based, Home Based Index and Homebased Door to Door) in Uganda indicated that all testing strategies had relatively low per client costs (Menzies et al 2009). They concluded that hospital-based HTC most readily identified HIV-infected individuals (27% prevalence) eligible for treatment, whereas home-based strategies more efficiently reached populations with low rates (>90% of all clients) of prior testing and HIV- infected people with higher CD4 cell counts. This study thus suggests that multiple HTC strategies with different costs and efficiencies can be used to enable populations to easily access

HTC. Costs per client (2007 USD) were \$19.26 for stand-alone HCT, \$11.68 for hospital-based HCT, \$13.85 for household-member HCT, and \$8.29 for door-to-door-HCT.

Suthar et al. (2013) conducted a systematic review and meta-analysis of community-based approaches on PubMed and clinical trial registries were searched as well as Embase and the World Health Organization Global Index Medicus were searched for studies including community-based HTC (i.e., HTC outside of health facilities). Randomized controlled trials, and observational studies were eligible if they included a community-based testing approach and reported one or more of the following outcomes: uptake, proportion receiving their first HIV test, CD4 value at diagnosis, linkage to care, HIV positivity rate, HTC coverage and cost per person tested. Similarly to aforementioned studies this meta-analysis of Community based approaches showed increased HTC uptake, the proportion of first-time testers, and the proportion of participants with CD4 counts above 350 cells/ml, and obtained a lower positivity rate relative to facility-based approaches. The study also found that in low and middle-income countries, the cost per person tested ranged from US\$2– US\$126. The study concluded that although few comparative cost data exist on the various HTC approaches, the reported estimates indicate that several community-based testing approaches are cheaper or similarly priced compared to facility-based HTC. They contend that the lower yield of people with HIV relative to facility-based HTC approaches appears to be offset by increasing knowledge of status at the population level, which, combined with timely linkage to treatment and prevention services, could have population effects on life expectancy and HIV transmission.

A study conducted by Mabuto et al (2014) investigated HTC utilization and HIV diagnosis using four strategies of HTC delivery namely; clinic based, urban mobile, rural mobile and standalone. This study concluded that client characteristics varied by HTC strategy and that rural and urban mobile units reached more men, first time testers and clients who considered themselves to be low risk for HIV. Urban mobile units had the highest proportion of male clients (52%). Rural mobile units reached the highest proportion of clients with no prior HCT (61%) and reporting no perceived HIV risk (64%). Overall, 10,862 clients (9.3%) tested HIV-positive.

Grabbe et al(2010) study compared client volumes, demographics, test results, and cost of 3 mobile HTC approaches with existing standalone HTC in Kenya. They concluded that adding mobile HTC to existing standalone HTC seems to be a more cost effective approach for expanding HCT coverage to reach different target populations including women and young people and for identifying people with newly diagnosed HIV infection. The study also shows a higher uptake of couples at standalone facilities as opposed to Mobile HCT. The study results indicate that mobile HTC reported a higher proportion of clients with no prior HIV test than standalone (88% vs 58%). Standalone HTC reported a higher proportion of couples than mobile HTC (18% vs 2%), and a higher proportion of discordant couples (12% vs 4%). The incremental cost effectiveness of adding mobile HTC to standalone services was US\$14.91 per client tested vs 26.75 for standalone HTC, 16.58 per previously untested client vs 43.69 for standalone HTC and 157.21 per HIV positive individual identified vs 189.14 for standalone HTC.

Touré et al (2013) investigated Public sector services for the prevention of mother-to-child transmission of HIV infection: a micro-costing survey in Namibia and Rwanda. This study found estimated costs to the providers of PMTCT, for each mother–infant pair, were US\$ 202.75–1029.55 in Namibia and US\$ 94.14–342.35 in Rwanda and that adult testing and counselling accounted for the highest proportions of the national costs (37% and 74% in Namibia and Rwanda, respectively), followed by management and supervision. The study concluded that the costs involved in the PMTCT of HIV varied widely between study countries and in accordance with the protocols used. However, they found that since the per-capita costs were relatively low, the scaling up of PMTCT services in Namibia and Rwanda should be possible which includes Provider Initiated Testing and Counseling.

An earlier study by Dandona et al (2005) examined the cost and efficiency of VCT services in India and found that increasing the number of VCT's could yield even higher benefits if the demand for these services was enhanced, as this would increase the number of clients served and reduce the cost per client. Although this is a very different setting from that of Namibia in that HIV prevalence is lower and access to testing at the time was an issue these findings shed some light on possible ways to reduce cost. Forstythe et al (2002) indicate that integrating services into centers can significantly reduce the cost of VCT furthermore, they postulate that if health center staff are hired to perform the Counseling additional cost reductions maybe feasible.

This study revealed that the incremental cost from the government's perspective of adding VCT is approximately 16 US\$ dollars per client this cost estimate according to the researcher may be partly attributed to the integration of VCT services into existing health centers rather than standalone sites. They suggest that the cost of VCT services may be further reduced to as little as 8 US\$ dollars per client if a government health worker could perform the counseling. Although this study is very old their findings shed some light on integration of services and the possible reductions and cost savings with such an approach. Remme et al (2014) assessed the scope for cost savings and efficiency gains in HIV services in low and middle income countries and found that cost efficiency may be improved by reducing input prices, task shifting and improving client adherence. They further contend that HIV programs need to optimize the scale of service provision to achieve efficiency and investigate the potential of integrated service delivery which they contend could be more efficient than standalone services.



2.7.3 Table 2.2: Summary of cost per client

Study	HTC Strategy	Cost per positive client identified.	Study year	Conclusion	Populations reached
Forstythe et al 2002	VCT- Integrated Health Services	\$16 \$8	2002	Integrating VCT services into health facilities can significantly reduce the cost of VCT furthermore, he postulate that if health center	Not indicated
Dandona et al (2005)	Not indicated	Not indicated	2005	increasing the number of VCT's could yield even higher benefits if the demand for these services was enhanced, as this would increase the number of clients served and reduce the cost per	Not indicated
Menzies et al 2009	Standalone	\$19.26	2009	Standalone, Hospital Based, Home based testing strategies had relatively low per	Not indicated
Menzies et al 2009	Hospital Based	\$11.68	2009	Same as above	More readily identified HIV positive Patients
Menzies et al 2009	Home Based: Door to Door	\$8.29	2009	Same as above	home-based strategies more efficiently reached populations with low rates (>90% of all clients) of prior testing and HIV- infected people with higher CD4 cell counts
Menzies et al 2009	Index patient	\$13.85	2009	Same as above	Same as above

Grabbe et al 2010	Mobile HTC	\$157.21	2010	They concluded that adding mobile HTC to existing standalone HTC seems to be a more cost effective approach for HCT people with newly diagnosed HIV infection coverage to reach different target populations including women and young people and for identifying	HTC reported a higher proportion of clients with no prior HIV test than standalone (88% vs 58%).
Grabbe et al 2010	Standalone	\$189.14	2010	Same as above	Standalone HTC reported a higher proportion of couples than mobile HTC (18% vs 2%, and a higher proportion of discordant couples (12% vs 4%).
Obure et al 2012	PITC	\$ 4.81- 13.5	2012	Cost per client and per person testing HIV positive is lower for PITC than VCT	Not indicated
Obure et al 2012	VCT	\$ 5.05- 19.03	2012	Same as above	Not indicated
Mabuto et al 2014	Urban Mobile Unit	Not indicated	2014	This study concluded that client characteristics varied by HTC strategy and that rural and urban mobile units reached more men, first time testers	Urban mobile units had the highest proportion of male clients (52%).

Mabuto et al 2014	Rural Mobile Unit	Not indicated	2014	Same as above	Rural mobile units reached the highest proportion of clients with no prior HCT (61%) and reporting no perceived HIV risk (64%).
De Beer et al (2015) Namibia	mobile clinic	US\$60.59 US\$37.76 (After private employer contributions deducted)	2015	They concluded that mobile clinics can provide cost-effective wellness testing services at the workplace and have the potential to mobilize local private funding sources.	Not indicated
De Beer et al (2015) Namibia	Standalone Centers (New Start Centers)	New Start centers was estimated at US\$58.2	2015	Not indicated	Not indicated

## 2.8 SUMMARY

The abovementioned literature shows an array of outcomes suggesting that cost per client ranges from lowest \$4.81 to the highest- \$189. The literature also indicates that different strategies can reach different sub populations with varied cost implications with the potential to have greater treatment and prevention benefits.

This literature review shows that the PITC approach (facility-based strategy) more readily identifies a higher proportion of HIV positive clients and appears less costly than traditional VCT standalone approaches. Facility-based testing inclusive of PITC and Integrated VCT also see a higher uptake of females as opposed to males. Standalone VCT centers costs appears to be higher than health facility-based HTC, however the Standalone HTC reported a higher proportion of couples than mobile HTC (18% vs 2%, and a higher proportion of discordant couples (12% vs 4%). Some studies indicate that community based approaches are similarly priced or cheaper compared to Health facility based strategies additionally community based approaches showed an increased number of clients tested, higher proportion of first time testers and higher CD4 cell counts among HIV positive clients which implies that clients tested through community based approaches if initiated earlier on treatment and successfully linked effectively to treatment, care and support services would have better treatment outcomes and prevention benefits. Other studies however show that all facility based and community based approaches had relatively low per client costs. Whilst other studies indicate that integrating VCT services into health centers can significantly reduce the cost (if health center staff perform the counseling) additional cost reductions may be feasible.

Other studies indicate that with mobile approaches to urban areas more men and first-time testers as well as clients who consider themselves to be low risk for HIV can be reached.

The literature review shows that National Testing Day campaigns generally attract higher numbers of clients. Costing for this approach varies based on the strategies utilized such as when testing is included as a part of other disease campaigns vs standalone testing campaigns. Workplace testing mostly done through mobile outreach approaches as well as other approaches and is known to attract higher proportions of men and higher proportions of HIV positives and costs vary depending on context.

In conclusion the literature shows that various key target populations can be reached with various HTC Strategies at various costs depending on the country context. Additionally, Remme et al (2014) postulates that costing studies should be compared cautiously as different costing methods lead to different estimates and this will have policy implications and further states that depending on which methods is used, conclusions on a program's cost-effectiveness and eligibility for resource allocation could differ. They further contend that different methods can respond to different questions, but when comparing the relative value for money of interventions, it is important to understand if the costing methods underpinning the economic evaluation are comparable.

Finally, WHO (2015) indicates that the challenge is that cost effectiveness analyses may not be widely generalizable across settings and that the cost of a programme, and hence its relative cost-effectiveness, depends greatly on the details of the programme itself. The next chapter outlines the study methodology.

## **CHAPTER 3 RESEARCH METHODOLOGY**

### **3.1. INTRODUCTION**

This chapter describes the operational approaches and research methodology. According to Best and Kahn (2006), research can be divided into two broad categories: quantitative research and qualitative research. In quantitative research, the researcher collects data which is analyzed numerically. On the other hand, qualitative research describes events without the use of numerical data. This study made use of the quantitative method to collect and analyze data.

### **3.2. STUDY DESIGN**

This is a quantitative non experimental, retrospective descriptive research study design. According to Brink (2006) a quantitative research design is described as focusing on measurable aspects of human behavior as well as focusing on a relatively small number of concepts which are concise and narrow and analyses numeric information through statistical procedures. Brink (2006) describes a non-experimental design as the non-manipulation of the independent variable and therefore there is no intervention; nor is the setting controlled. A retrospective descriptive design is defined by Brink (2006) as a design that measure variables that have occurred in the past. A retrospective analysis of HTC service data and program financial information on different HTC service delivery strategies implemented in Namibia between for the following three financial years 2010-2011, 2011-2012 and 2012-2013 was conducted. The HTC service strategies of interest are all Public Health Facilities, New Start Standalone Centers, National Testing day campaigns, and workplace testing done by Healthworks/ Pharmaccess.

Routinely collected HTC service statistics data for HTC strategies in Namibia contains individual socio-demographic data, previous HIV testing experiences, sexual partner's HIV testing, outcome of the HIV test amongst others. This data was compared with HTC program expenditure information for each HTC service delivery strategies.

### **3.3. STUDY POPULATION**

Data relating to all clients who received HIV testing in each of the specified HTC service strategies during the period between the financial years 2010/11 -2012/13 and programme expenditure information for one financial year 2012/13 was included in the analysis.

### **3.3. SAMPLE AND SAMPLING PROCESS**

National Data was used therefore no sampling procedure followed. All the tests reported nationally for each HTC service delivery strategy were analyzed.

### **3.4. RESEARCH INSTRUMENTS**

Programme output data was obtained from existing databases for three financial years 2010/11, 2011/2012 and 2012/13. Programme expenditure information was obtained from financial reports and extracts for the financial year April 2012-March 2013 across HTC service delivery strategies.

### 3.5. DATA COLLECTION PROCEDURE

There following procedures were followed per study objectives:

#### **Objective 1: To describe HTC output data across HTC service delivery strategies**

Firstly, Programme output data across service delivery areas were extracted from the original databases and converted into Microsoft Excel. Once data was converted, the data was converted according to codes as per the standard HIV Testing MoHSS register 2010 version. The data was then cleaned and merged into one file. This programme output data across service delivery strategies was analyzed by using the EPI info 7 computer programme. The database for workplace testing and standalone New Start Centers were incomplete for the financial year 2012-2013 hence monthly summary reports were used to complete this data and the data was then manually added to the EPI Frequencies. Finally tables and graphs were then produced in Microsoft excel.

The following variables were analyzed per HTC service delivery strategy:  
following variables across service delivery areas:

- Proportion of clients counseled, tested and received results
- Proportion of HIV infected individuals identified
- Proportion of first time testers identified
- Proportion of couples tested
- Proportion of men tested



**Objective 2: To describe input costs per HTC service delivery strategy**

Secondly, programme input costs per service delivery area was extracted from available financial reports and extracted from existing financial databases to coincide with the Government financial years. Only input data for the financial year 2012-2013 was readily available hence the input analysis is only for that period. The financial inputs were divided according to the following cost categories:

- **Salaries of all personnel:** contributing to the work in HTC site including fringe benefits was computed.
- **Recurrent goods:** include HIV test kits and supplies, male condoms, behavioral and communication materials, stationary and some miscellaneous items
- **Capital Goods:** include furniture, electrical fixtures, air conditioners, refrigerators, lockable cabinets, computer etc.
- **Rentals:** For all HTC services provided in Public Health facilities no rent is paid. Rent for other organizations was computed
- **Recurrent services** include training of staff, cleaning, building maintenance, electricity, water, telephone, gas/oil, waste disposal, photocopying, printing, postage and courier, and some miscellaneous items. The cost for staff training was calculated by including travel fare, per diem allowances, trainer fees, training materials and training facility cost. Costs of telephone and other recurrent services were calculated based on actual usage.

**Objective 3: To calculate and compare the cost per client tested for HIV delivered using different HTC strategies**

Financial expenditure input cost data and programme output data for the financial year 2012-2013 was utilized to compute the: cost per client tested, cost per HIV positive client identified, cost per couples tested and cost per first time testers identified. The expenditure data was computed in Namibian Dollars and also converted to US\$ dollars. The average exchange rate in respect to the United States Dollars 9.254 for reporting period 2012-2013 was used for this study (MoHSS 2014). The Namibian dollar amounts contained in the data is converted to US dollar using these exchanges rates, irrespective of the month in which the expenditure was incurred. Cost per client was determined using the following method:

- Total expenditure per HTC Service delivery area divided by the Number of clients counseled and tested for the financial year 2012-2013
- Total expenditure per HTC Service delivery area divided by the Number of HIV positive individuals for the financial year 2012-2013
- Total expenditure per HTC Service delivery area divided by the Number of Newly tested individuals for the financial year 2012-2013
- Total expenditure per HTC Service delivery area divided by the Number of Couples tested for the financial year 2012-2013

### 3.6 ETHICAL CONSIDERATIONS

Permission to conduct the study and ethical approval was granted by the University of Namibia postgraduate committee and also by the MoHSS research committee prior to the commencement of the study as indicated in Annexure A, B and C respectively. To protect the identity of clients de identified data was utilized for the purpose of the study.

### 3.7 VALIDITY

Validity is defined by Brink et al (2006) as being concerned with the accuracy and truthfulness of scientific findings. There are two types of validity namely internal and external validity. **Internal validity** is described by Brink et al (2006) as the extent to which conclusions effectively represent empirical reality and, secondly, assessing whether constructs devised by researchers represent or measure the categories of human experience that occur. **External validity** is further described as the degree to which the results of a study can be generalized to other people and settings. The following paragraphs describe efforts made in this study to ensure internal and external validity.

#### 3.7.1 Firstly, the internal validity was ensured through use of standardized data collection tool.

**HTC service output data:** This is a standardized database used by MOHSS for collecting routine HIV testing service data captured in a standardized HIV Testing Register available across public and non-public service delivery models.

This tool has standardized variables which were fielded after an initial piloting for their validity and relevance.

**Input expenditure data:** Expenditure data is not reported to the MOHSS in a standardized format hence itemization of cost data differs across service delivery strategies. The researcher however categorized the expenditure data according to the cost categories as per the study objectives.

**3.7.2 Secondly, the internal validity with regards to sample size and sampling strategy:**

The MoHSS standard electronic database was utilized to obtain output service data for three fiscal years across all HTC strategies. The principle investigator obtained this data in full without a need for applying sampling techniques or interviews thus limiting the chances of introducing bias in the study findings which might be attributable to sampling and data collection procedures.

**3.7.3 Thirdly, the internal validity with regards to the Data analysis is as follows:**

This study used univariate and bivariate data analysis techniques to describe frequencies and proportions. Some variables did not have sufficient statistical power to allow measurement of associations of different outcome/independent variables to HIV test yield or cost of HTC service strategies using multi-variate analysis.

**3.7.4 Fourthly, the External validity with regards to Sampling is as follows:** The output service data utilized for this study was obtained from the HTC services which were operational at the time of which Public Health facilities remain the largest provider of testing services in Namibia. However there could be sampling bias which can be attributed to the fact that the study focused on clients attending these services (self-selected) and not those clients found in the community as would be the case in a population based study.

### **3.8 RELIABILITY**

Reliability is described by Brink et al (2006) as being concerned with the consistency, stability and repeatability of the informant's accounts, as well as the researchers' ability to collect and record information accurately. Reliability with regards to the service output data would be fairly accurate as the HIV test yield rate would most likely remain the same if the study is repeated sometime in the future due to the stable nature of HIV epidemic in Namibia.

However one might find different outcomes with regard to analysis expenditure due to variations of data capturing approaches for different HTS service providers and the measures underpinning costing. Additionally, there may be an under or over representation of cost per HIV positive client identified due to reporting differences and omission of some financial data by some service delivery organizations.

### **3.8 SUMMARY**

This chapter described the research methodology which includes study design and population and data collection procedures which was utilized for this study. This section also discusses the the measures taken to ensure validity and reliability of the study. The next chapter presents the research findings and discussions.

## **CHAPTER 4**

### **PRESENTATION OF THE RESEARCH FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

In the previous chapter the research methodology and design were discussed. In this chapter the data is presented, analyzed and interpreted in three sections as per the study objectives: **Section 1:** Describes HTC output data across service delivery strategies; **Section 2:** Describes HTC input expenditure costing data across service delivery strategies; **Section 3:** Describes cost per client tested, cost per HIV positive identified, cost per first time tester identified and cost per couples and men identified across HTC service delivery strategies. The Namibian Government reporting and financial years is coded as follows: FY11 is for the reporting period April 2010-March 2011, FY12 is for the reporting period April 2011- March 2012 and FY13 is for the reporting period April 2012- March 2013.

#### **SECTION 1: HTC OUTPUT DATA ACROSS HTC SERVICE DELIVERY STRATEGIES FOR FINANCIAL YEARS (FY) 2011-2013.**

##### **4.2. Proportion of HIV tests conducted per HTC service delivery strategy FY 2011-2013**

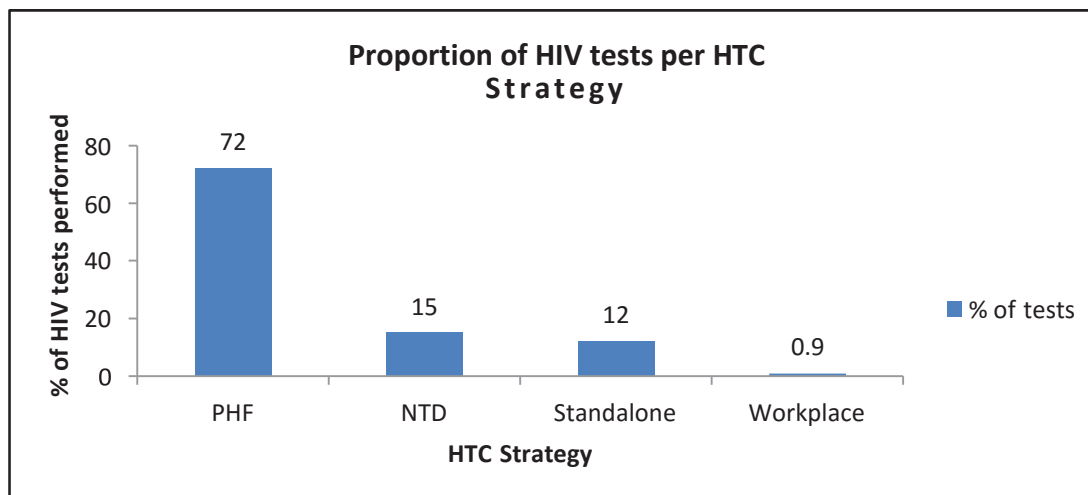
**Figure 4.1: Proportion of tests per HTC Strategy for FY 2011-2013**

Figure 4.1 above illustrates that the highest proportion of tests done are recorded for Public Health Facilities (72%) followed by NTD (15%) with the lowest proportion of tests conducted at the workplace (0.9%).

#### 4.2.2 Number of HIV Tests per HTC Strategy for each Financial Year 2011-2013

**Table 4.2: Number of Tests per HTC Strategy for FY 2011-2013**

FY	PHF	NTD	Standalone	Workplace
FY11	124289	39858	25000	4849
FY12	227569	35307	26197	1324
FY13	214294	44134	25343	683
<b>Total</b>	<b>566152</b>	<b>119299</b>	<b>76540</b>	<b>6856</b>

Table 4.2 above illustrates the number of tests per HIV Testing Strategy for the Financial Years 2011-2013 with the highest number of cumulative tests conducted at the Public Health Facilities with 566 152 and the least amount tested at the workplace with 6856 tests conducted. Below the trend of HTC uptake per HTC strategy is discussed.



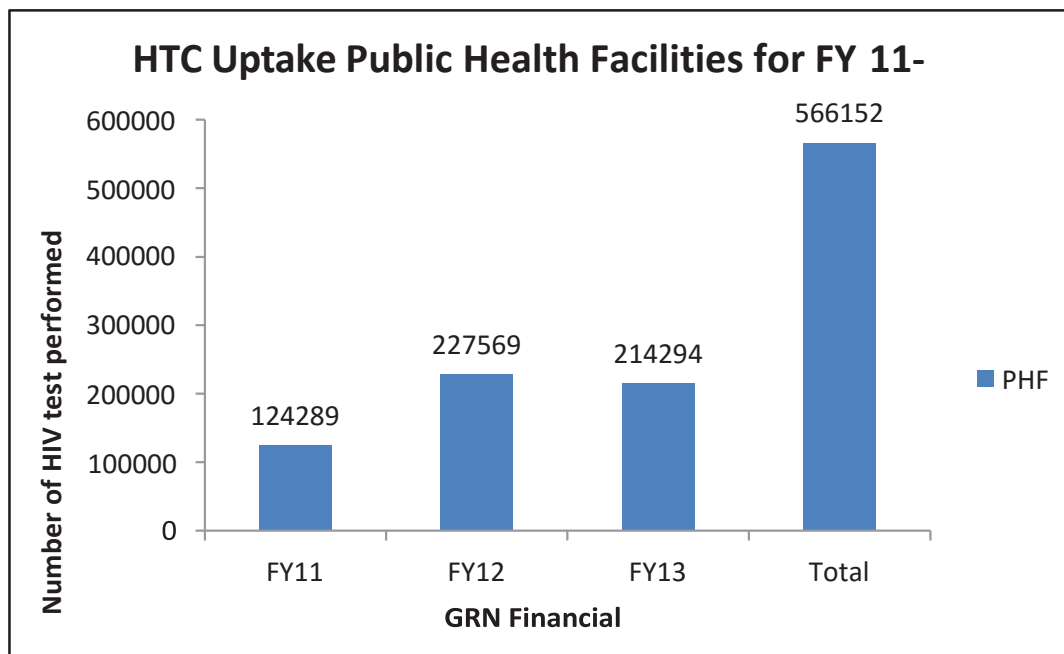
**423 Trend of HIV tests performed at Public Health Facilities FY 2011-2013****Figure 4.2: HTC Uptake at Public Health Facilities for FY 2011-2013**

Figure 4.2 above illustrates the trend for HIV testing in public health facilities which shows an increase in uptake from FY11 to FY12 with a cumulative number of tests amounting to 566 152 tests performed over three years (FY 11-13). The expansion of geographical coverage of HIV Rapid Testing services at public health facilities has ensured greater access to testing services hence the increase in the number of clients tested over the years.

#### 424 Trend of HIV test performed during NTD for each Financial Year 2011-2013

Figure 4.3: HTC Uptake during NTD FY 11-13

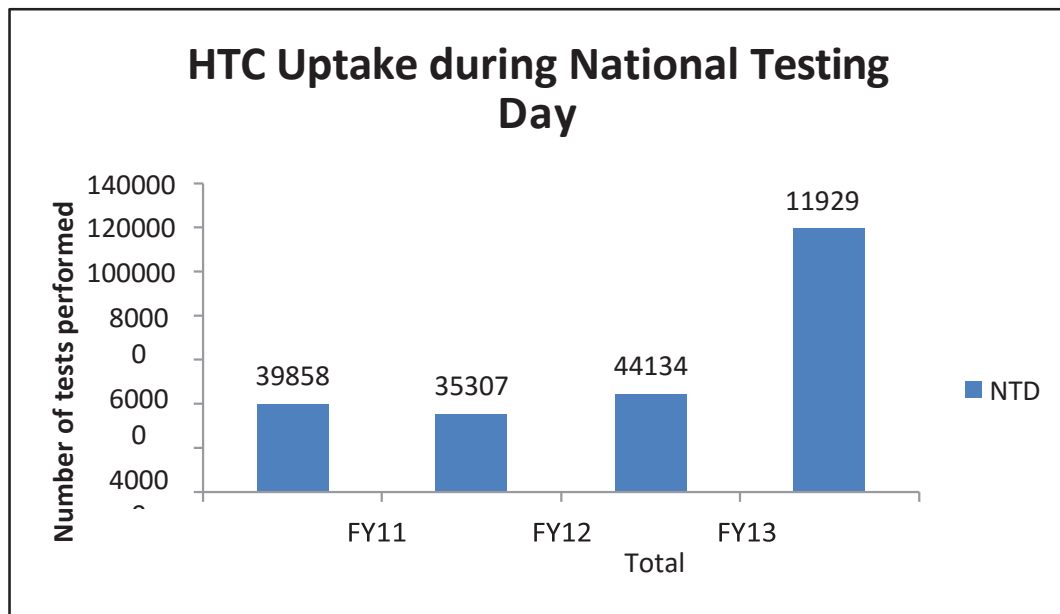


Figure 4.3 above shows that the number of tests performed during NTD ranging from 35 000- 44 000 for the FY11-13. The National Testing days were conducted between 1-3 days.

#### 4.2.5. Trend of HIV tests performed at Standalone centers FY 11-13

Figure 4.4: HTC Uptake at Standalone centers FY11-13

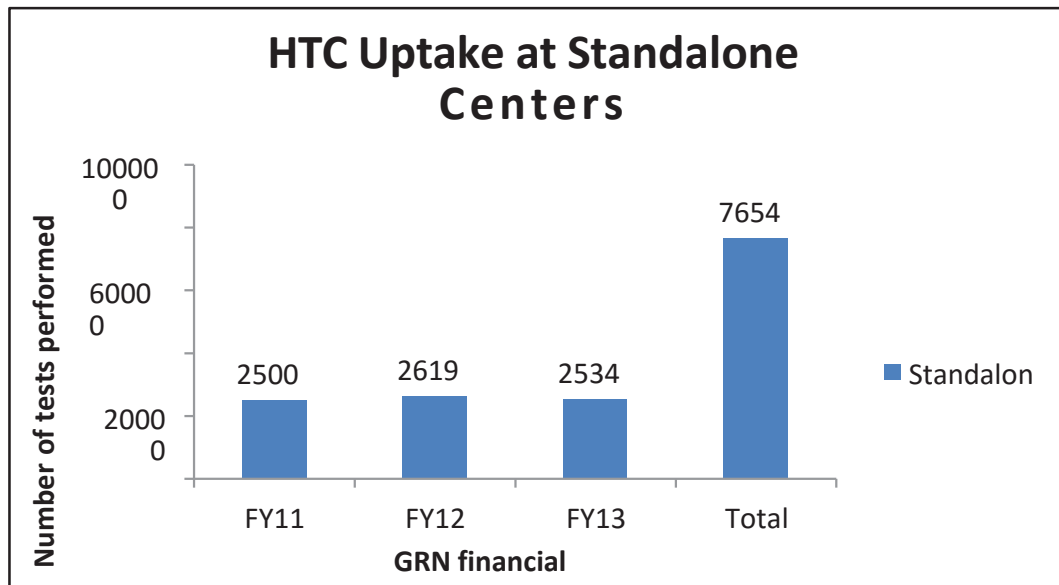


Figure 4.4 above indicate that the number of tests performed at standalone facilities ranged between 25000-26000 for each of the financial years 2011-2013.

#### 4.2.6 Trend of HIV tests performed at workplace for each financial year FY2011-

2013

Figure 4.5: HTC Uptake at workplace FY 11-13

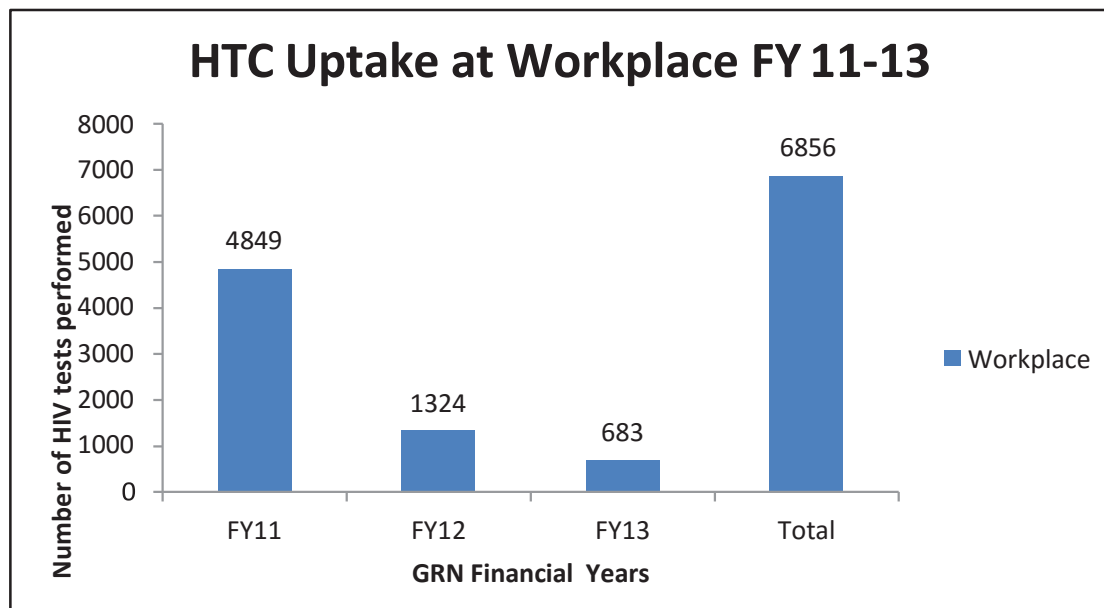


Figure 4.5 above indicate that the highest number of tests which was 4849 were performed during FY11 and have since declined to only 683 tests performed during FY13. This dramatic decrease in uptake needs further investigation.

### 4.3.1 HIV Positivity per HTC Strategy

**Figure 4.6: Proportion of HIV positive Tests per HTC Strategy for FY11-13**

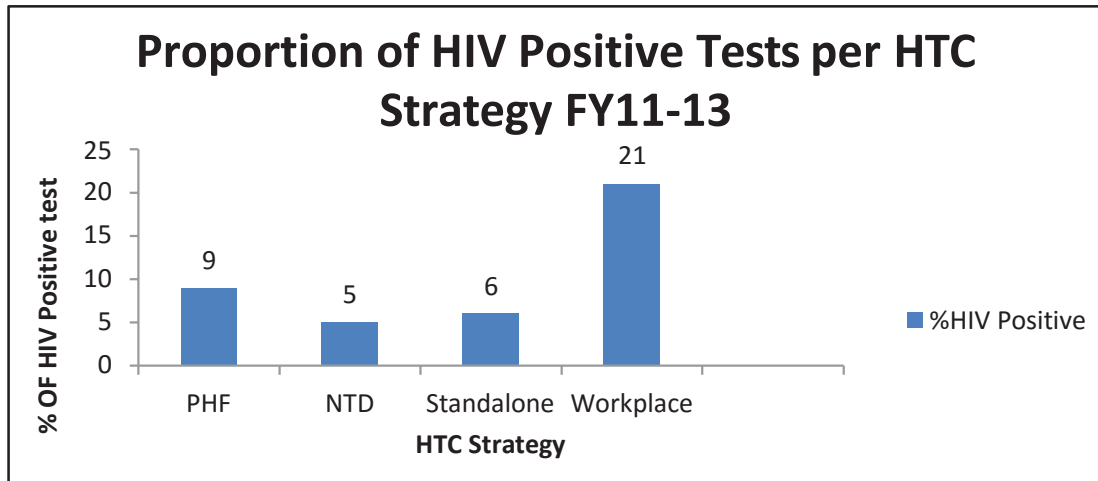


Figure 4.6 above illustrates that the highest proportion of HIV positives for the period FY11-13 is observed at workplaces with 21% followed by 9% at Public Health Facilities (PHF) with the lowest positivity rate observed for National Testing Days at 5%. The workplace positivity yield results show a twofold difference as opposed to Public Health Facilities.

### 4.3.2 First Time Testers per HTC Strategy

Figure 4.7: Proportion of First Time testers per HTC Strategy FY11-13

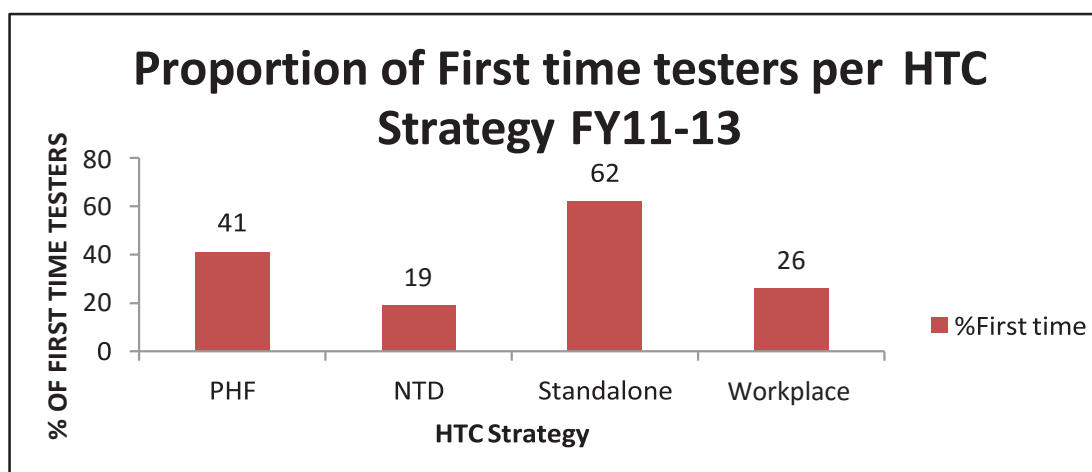


Figure 4.7 above shows that the highest proportion of first time testers for the Financial Years 11-13 is observed at Standalone VCT centers with 62% and the lowest proportion of first time testers was recorded for National Testing Days with 19%. WHO (2012) indicate that to expand the number of people who know their HIV status, programmes should prioritize first-time testing and set targets for it.

### 4.3.3 Individuals tested as couples per HTC Strategy

**Figure 4.8: Proportion of individuals tested as Couples per HTC Strategy FY 11- 13**

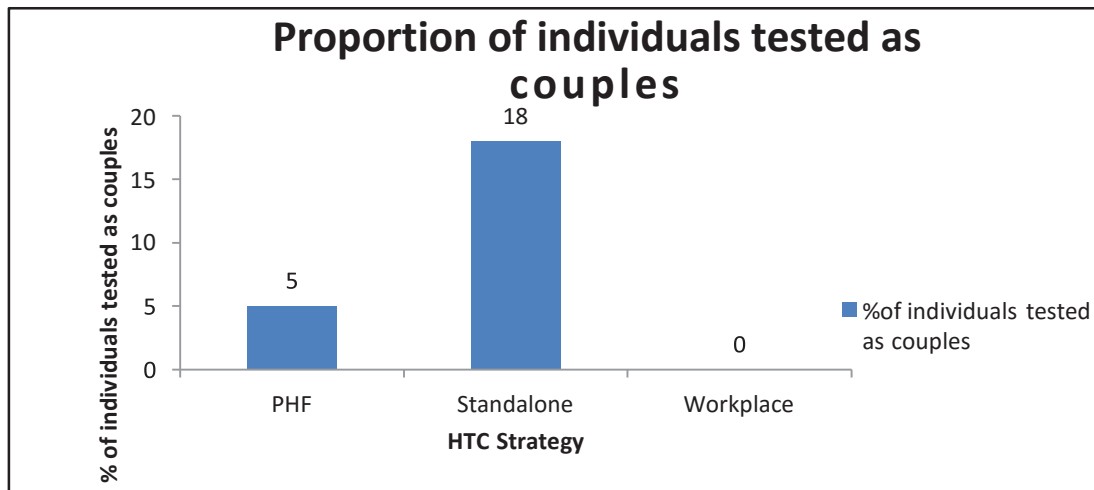


Figure 4.8 above indicates that the highest proportion of individuals tested as couples for Financial Years 11-13 is observed at standalone VCT centers with 18% and Public health facilities (5%) and (0%) individuals tested as couples in the workplaces.

#### 4.3.4 Males tested per HTC strategy

**Figure 4.9: Proportion of males tested per HTC Strategy FY11-13**

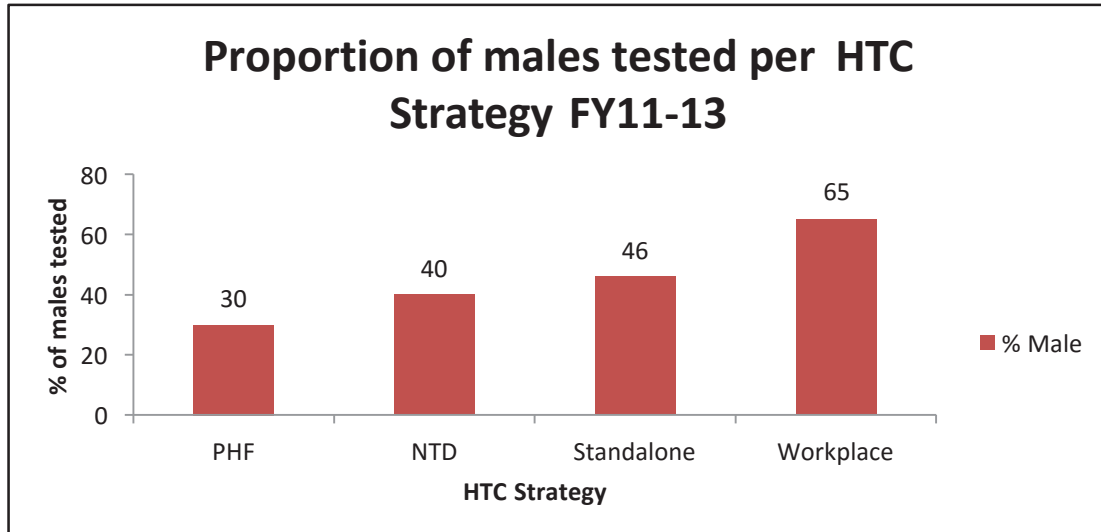


Figure 4.9 above illustrates that the highest proportion of males tested during the financial years 11-13 was observed in the workplace at 65% followed by Standalone VCT centers at 46% and the lowest proportion of males tested was recorded for Public Health Facilities at 30%.

#### 4.4 Summary of Output Result and discussion

The output results show that 72% of all HIV tests conducted for all the study HTC service delivery strategies conducted for FY 11-13 were conducted at public health facilities and the lowest number of tests conducted in workplaces with 0.9%. The DHS (2013) results indicate about 70% of HIV testing occurs at public health facilities which confirms this study finding. The highest positivity rate is observed at workplace testing with 21% however with the least amount of clients tested through this model and the lowest proportion of first time testers.



This could mean that some of the positives identified through this strategy may not be newly diagnosed. Corbett et al (2006) also found high positivity ranging 19.8% and 18.4% in a randomized trial to assess uptake workplace uptake of HTC. They also concluded that VCT at the workplace offers potential for high uptake when offered onsite and linked to basic HIV care. Standalone VCT centers had the highest proportion of first time testers with 62% and the lowest proportion of first time testers were recorded for National Testing Days (19%). This low proportion of First time testers during NTD remains a concern because one of the key objectives for NTD was and is to identify first time testers. Workplace Testing recorded the highest proportion of males tested at 65% and the lowest proportion of males tested were recorded at Public Health Facilities at 35%. WHO (2015) contend that the lower HTC uptake of males is because HTC is conducted mainly in reproductive health services therefore they recommend additional approaches to increase uptake of HTS among men, including the provision of HTC in settings that are more appropriate and acceptable to men. The high uptake of men testing at the workplace coupled with a high positivity rate of 21% show that there is potential in reaching more HIV positive men through the workplace testing approach.

The highest proportion of individuals tested as couples were recorded at Standalone VCT centers for the FY 11- 13 at 18% and 5% in public health facilities with no couples tested in the workplace. These findings are consistent with Grabbe et al (2010) who found that Standalone HTC reported a higher proportion of couples than mobile HTC (18% vs 2%, and a higher proportion of discordant couples (12% vs 4%). WHO (2015) recommends that couples and sex partners to be tested together as this may result in better treatment and prevention outcomes given the compelling evidence in the HTPN 02 study.

The following section will show the input results. These results is consistent with literature in that it shows that the different service delivery models reach different target populations and depending on the programme goals each service delivery strategy can contribute meaningfully to the National scale up of HTC.

## 4.5 SECTION 2: ESTIMATED INPUT COSTS PER HTC SERVICE DELIVERY STRATEGY FOR FINANCIAL YEARS (FY)2011-2013.

### 4.5.1 Introduction

This section indicates the results and discussions related to the input cost for each of the HTC service delivery strategies.

### 4.5.2 Estimated Input Costs per cost category

**Table 4.3 Public Health Facilities Input Cost for FY 13**

Cost categories	FY 13 PHF	FY 13 PHF	%
	N\$	US\$	
Salaries & Fringe benefits	17,835,42 9.94	1,927,3 21.15	39
Recurrent goods	18,781,35	2,029,5	41
Capital goods	5,049,325 10	545,637 .03	11
Rentals	0	-	0
Recurrent services	3,912,557 .04	422,796 .31	9
<b>Total</b>	<b>45,578,66 5.00</b>	<b>4,925,2 93.5</b>	<b>10 0</b>
<b>Exchange Rate: 9.254 (average US\$ for FY13)</b>			

The table 4.3 above illustrates that the highest expenditures for Public Health Facilities during the Financial Year 2012/13 was incurred in the cost category recurrent goods (41%) and salaries and fringe benefits (39%) with the 9% expenditure incurred for recurrent services.

#### 4.5.2 Estimated Input Costs per cost category

**Table 4.4: National Testing Day Input Cost for FY 13**

Cost categories	FY13 NTD	FY 13 NTD	%
	N\$	US\$	
Salaries & Fringe benefits	193,557.43	20,916.08	5
Recurrent goods	3,153,115	340,729.9	74
Capital goods	0	0	0
Rentals	0	0	0
Recurrent services	898,637.43	97,108	21
<b>Total</b>	<b>4,245,310</b>	<b>458,753.9</b>	<b>100</b>
<b>Exchange Rate: 9.254 (average US\$ for FY13)</b>			

The table 4.4 above illustrates that expenditures for recurrent goods (74%) were the highest followed by 21% for recurrent services and the lowest expenditure incurred were for salaries and fringe benefits (5%).

#### 4.5.3 Estimated input costs per cost category

**Table 4.5: Standalone VCT Centers input costs for FY13**

Cost categories	Total 4 Standalone facilities FY 13 (NAD)	Total 4 Standalone facilities FY 13 (US\$)	%
Salaries & Fringe	4,401,844.7	475,669.41	52
Recurrent goods	2,556,312.0	276,238.6	30
Capital goods	2,248.18	242.94	0.03
Rentals	740,606.90	80,031.00	9
Recurrent services	807,089.66	87,215.22	9
<b>Total</b>	<b>8,508,101.4</b>	<b>919,397.17</b>	<b>100</b>
<b>Exchange Rate: 9.254 (average US\$ for FY13)</b>			

The table 4.5 illustrates that the highest expenditures for the 4 standalone VCT Centers for the Financial Year 2012/13 were incurred in the cost category salaries and fringe benefits (52%) followed by recurrent goods (30%) with the lowest expenditures incurred for capital goods and recurrent goods (0.3%).

#### 4.5.4 Estimated Input Costs per cost category: Workplace Testing FY13

**Table 4.6: Workplace Testing input costs for FY 13**

Cost categories	FY 13 NABCOA	FY 13 NABCOA	%
	N\$	US\$	
Salaries & Fringe	1,256,500.00	135,779.12	5
Recurrent goods	328,591.20	35,508.02	1
Capital goods	590,000.00	63,756.21	2
Rentals	0	-	0
Recurrent services	0	-	0
<b>Total</b>	<b>2,175,091.20</b>	<b>235,043.35</b>	<b>1</b>
<b>Exchange Rate: 9.254 (average US\$ for FY13)</b>			

The table 4.6 above illustrates that the highest expenditures for workplace testing for Financial Year 2012/13 is in the cost category of salaries and fringe benefits (58%) with 0% expenditures incurred for rentals and recurrent services.

#### 4.6 Summary of Estimated Input Costs

**Table 4.7: Summary of Percentage contribution per cost category per  
HTC Strategy FY 2012/13**

<b>Cost categories</b>	<b>PHF (%)</b>	<b>NTD (%)</b>	<b>Standalone (%)</b>	<b>Workplace (%)</b>
Salaries & Fringe benefits	39	5	52	58
Recurrent goods	41	74	30	15
Capital goods	11	0	0.03	27
Rentals	0	0	9	0
Recurrent services	9	21	9	0

Table 4.7 above illustrates the percentage contribution per cost category for each HTC service Delivery Strategy for the financial year 2012/2013. Salaries and recurrent goods show the highest expenditures for almost all strategies which is indicative of the cost drivers.

#### 4.6.1 Percentage contribution for Salaries and Fringe benefits

**Figure 4.10: Percentage of Salaries and fringe benefits expenditure per HTC delivery Strategy FY 13**

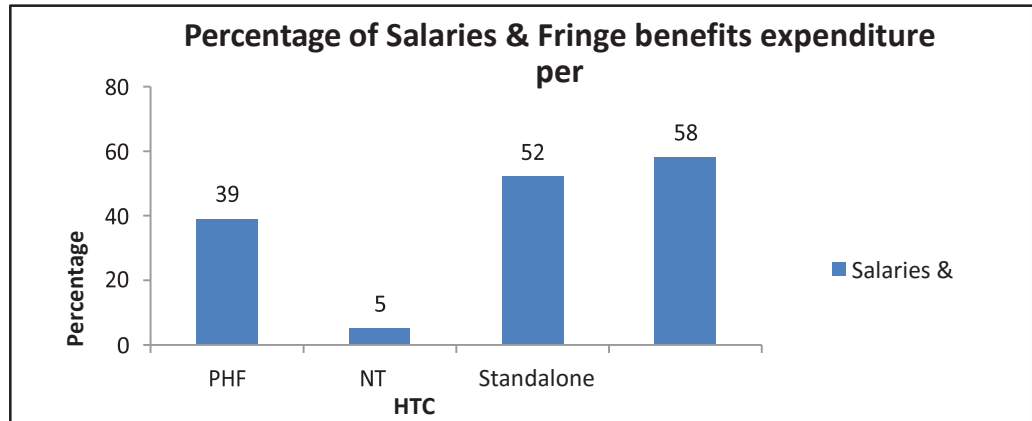


Figure 4.10 above illustrates that the highest expenditure for this cost category was incurred at the workplace 58% followed by PHF (52%) with NTD spending the least on salaries and fringe benefits with 5(%). These results show that both workplace and standalone facilities could benefit from understanding this cost driver better in their context and explore alternative strategies to lower expenditures in this cost category.

#### 4.6.2 Percentage contribution for recurrent goods

**Figure 4.11: Percentage contribution for recurrent goods per HTC strategy FY13**

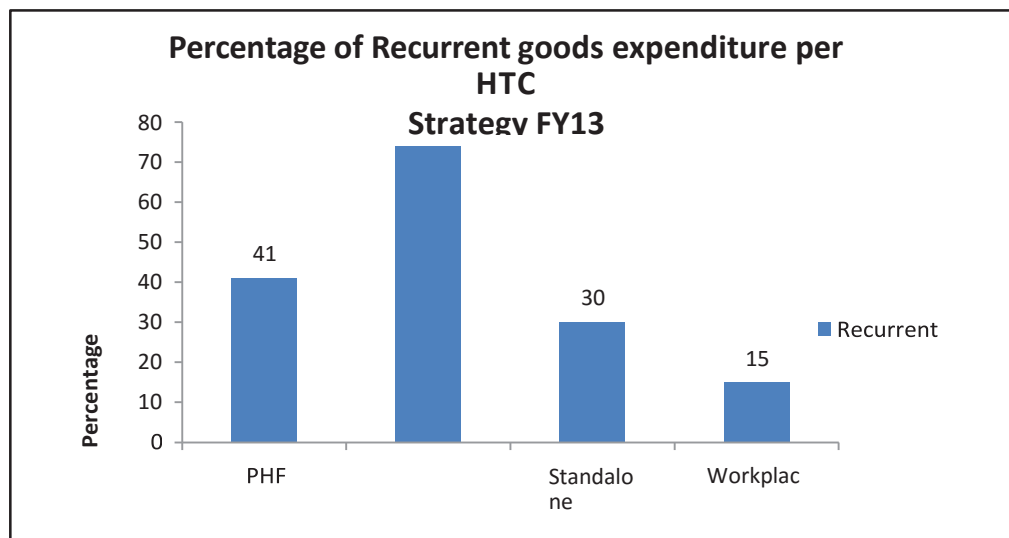


Figure 4.11 above illustrates that the highest expenditure in this cost category was for NTD (74%) followed by Public Health Facilities (41%) and the lowest expenditure in this cost category was at the workplace (15%). The cost driver for this category is the HIV Rapid Testing kits.



#### 4.6.3 Percentage of Capital Goods expenditure

**Figure 4.12: Percentage of Capital Goods expenditure per HTC Strategy FY13**

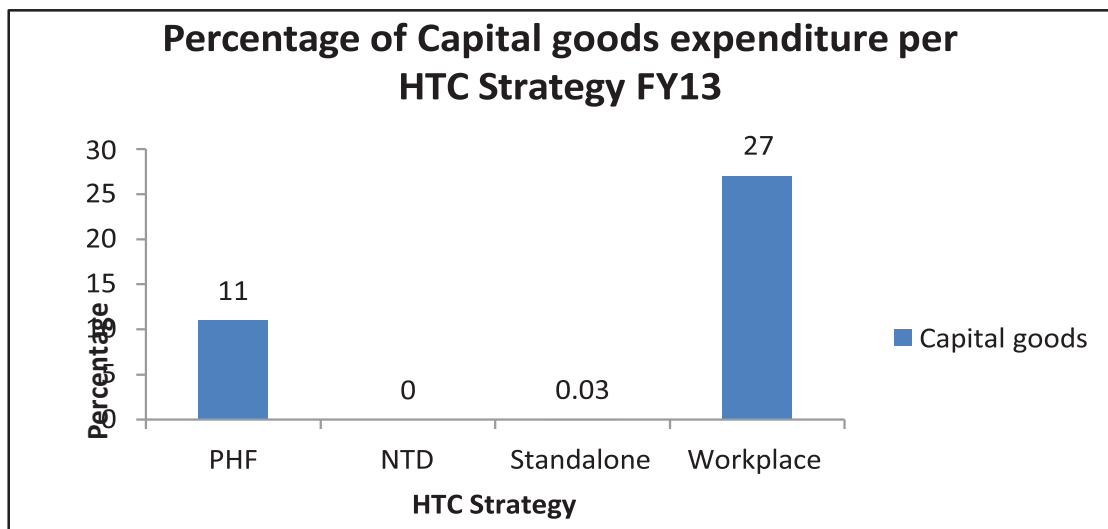


Figure 4.12 above illustrates that the highest expenditure in this cost category was with workplace (27%) followed by PHF (11%) and the lowest expenditure in this cost category was during the NTD (0%). NTD had the lowest expenditure for this cost category because existing infrastructure is used when these campaigns are conducted. The high expenditures for capital goods at workplace could possibly include the procuring of mobile vans which seems to be very costly.

#### 4.6.4. Percentage of Rentals expenditure

Figure 4.13: Percentage of rentals expenditure per HTC Strategy FY 13

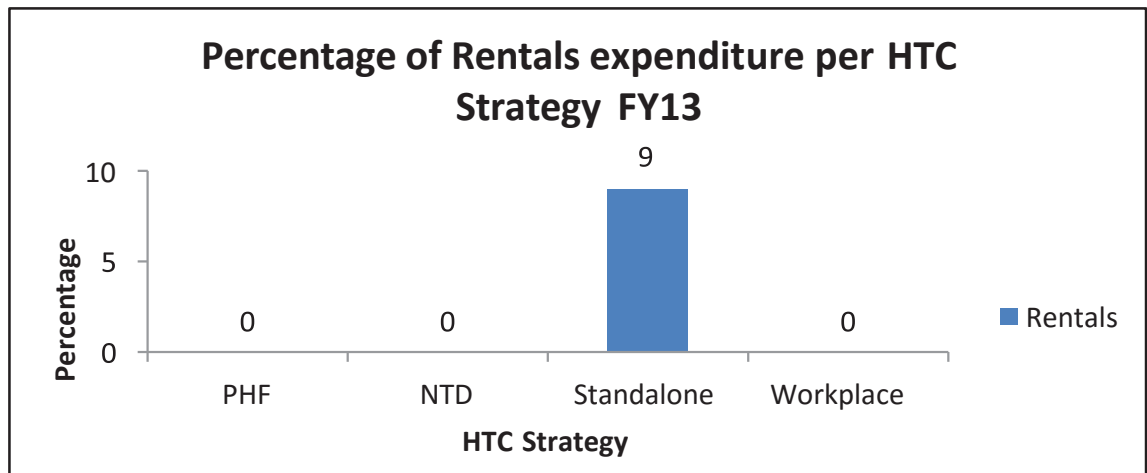


Figure 4.13 above illustrates that no rentals were paid for workplace, NTD and at PHF except for standalone facilities spending about 9% on rentals.

Standalone facilities have been renting buildings therefore they may look into alternative strategies to reduce expenditures on this cost category by looking into integration approach amongst other strategies.

#### 4.6.5 Percentage of Recurrent Services expenditure

**Figure 4.14: Percentage of Recurrent services expenditures per HTC strategy FY13**

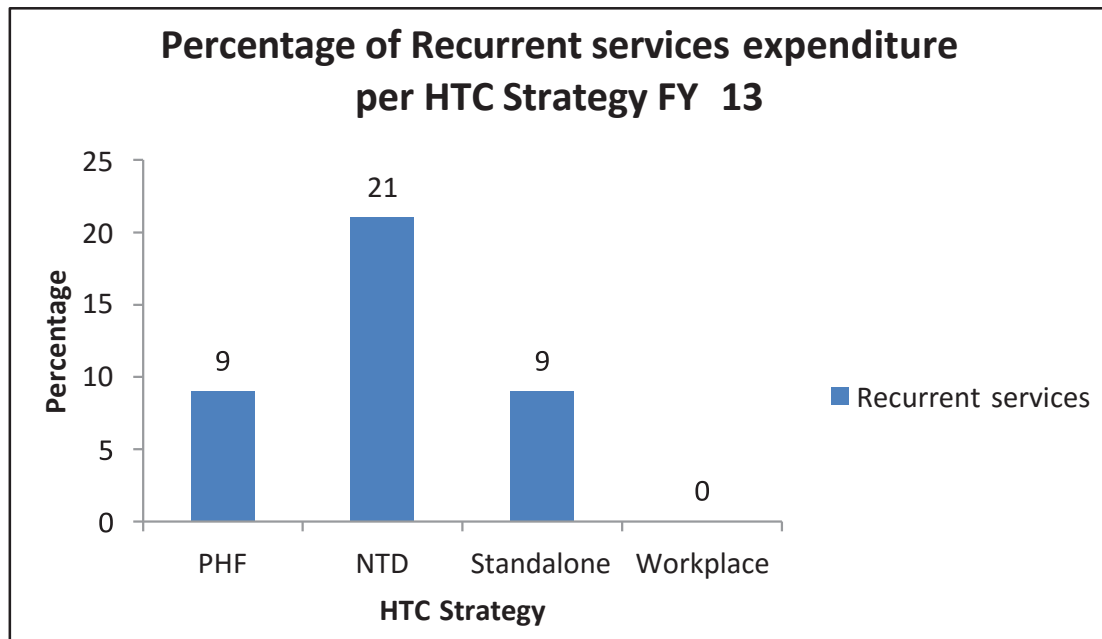


Figure 4.14 above illustrate that NTD incurred the highest expenditure for recurrent services (21%) followed by Standalone and PHF with 9% expenditure for both with the lowest expenditure incurred for this cost category at workplace with (0%).

#### 4.6 Summary for estimated input cost analysis

The highest expenditure for the cost category salaries and fringe benefits was incurred at the workplace with 58% on salaries and fringe benefits followed by PHF (52%) with NTD expending the least on salaries and fringe benefits with (5%). The highest expenditures for the cost category recurrent goods were incurred during NTD with 74%, followed by Public Health Facilities (41%) and the lowest expenditure in this cost category was at the workplace with 15%.

The highest expenditure for the cost category capital goods was incurred at workplace (27%) followed by PHF (11%) and the lowest expenditure in this cost category was during the NTD (0%). The highest Expenditure in the cost category rentals was incurred at standalone facilities (9%) and no rentals charged for the other strategies. The highest expenditure in the cost category recurrent services show that the NTD incurred the highest expenditure for recurrent services (21%) followed by Standalone and PHF with 9% expenditure for both and the lowest expenditure incurred for this cost category was for workplace (0%).

Obure et al (2012) obtained similar results and found that staff salary costs make up a significant proportion of total costs across all services (15% to 65%). Other costs which include diagnostics and supplies (35%-85%) are high in both Kenya and Swaziland. The Forstythe (2002) study conclusions indicate that an integrated approach by training existing staff may help to reduce cost or through a task shifting approach recommended by WHO (2015). The NTD approach utilized existing staff to conduct the testing with a small incentive for additional hours worked hence the low expenditure on salaries and fringe benefits. Additionally, the biggest contributor to the high recurrent goods is the procurement of HIV Rapid Testing kits to save cost on this particular line item Namibia can adopt the serial testing algorithm as per 2015 WHO recommendations as opposed to the current parallel testing algorithm.

In conclusion, the estimated crude cost analysis provides some insight into the expenditures for the FY13 and also show that for the various HTC service delivery strategies cost category expenditures varied.

High expenditures are recorded for salaries and fringe benefits for most of the HTC strategies except for National Testing Day and this could be attributed to the fact that NTD is a campaign and a once off event in a year and not a routine service that is offered daily as well as utilizing existing human resources to provide these services. PHF also show some efficiency in this cost category due to the use of the task shifting policy to allow lay counselor to conduct testing in public health facilities. There is also very high cost experienced for recurrent goods including procurement of HIV Rapid Testing Kits across all testing strategies. There is potential for saving substantial costs on procurement of test kits for Namibia by adopting the WHO recommendations for countries with generalized HIV epidemics with more than 5% HIV prevalence to consider a serial testing algorithm instead of a parallel testing algorithm (WHO, 2015). The following section will provide the cost per client analysis for the FY 13.

### **SECTION 3: COSTS PER CLIENT ANALYSIS PER HTC SERVICE DELIVERY STRATEGY**

#### **4.7.1 Introduction**

To describe the cost per client analysis the output results below in actual numbers were computed for the financial year 2012- 2013. The cost per client analysis was computed with the total expenditure divided by number of positives, couples and first time testers per HTC Strategy for the Financial year 2012-2013.

#### 4.7.1.1 Output results for FY 13

**Table 4.8: Output results for FY13**

Output results for FY 13	PHF	NTD	Standa lone	Workpl ace
Number of tests	214	4413	25343	683
Number of HIV Positives identified	16582	1859	1280	62
Number of first time testers identified	85350	0	23672	94
Number of Males	6288	1723	11926	385
Number of individuals	9606	-	4319	0

Table 4.8 above shows the output results in numbers for the Financial Year April 2012- March 2013 for the purposes of calculating cost per client tested, cost per positive identified, cost per first time testers identified and cost per individuals tested as couples identified.

#### 4.6.5 Cost per client tested per HTC Strategy

**Table 4.9 : Cost per client tested per HTC service delivery Strategy FY13**

HTC Strategy	Total number of clients FY13	Total expenditure FY13 (NAD)	Total expenditure FY13 (US\$)	Cost per client tested (NAD)	Cost per client tested (US\$)
PHF	21429	45,578,6	4,925,	213	23
NTD	44134	4,245,31	458,75	96	10
Standalo	25343	8,508,10	919,39	336	36
Workpla	683	2,175,09	235,04	3,185	344

Table 4.9 above illustrates that the cost per client tested was the lowest for National Testing day at 10 US\$ and followed by Public Health Facilities with 23 US\$ with the highest recorded for workplace testing at 344 US\$ per client tested.

#### 4.6.6 Cost per HIV positive individuals identified per HTC Strategy

**Table 4.10: Cost per HIV positives identified for HTC service delivery strategy FY13**

HTC	Number of HIV Positive	Total expenditure FY13	Total expenditure FY13	Cost per Positive	Cost per Positive
P	16582	45,578,6	4,925,29	2749	297
N	1859	4,245,31	458,753.	2284	247
Stan	1280	8,508,10	919,397.	6647	718
Wor	62	2,175,09	235,043.	35,082	3,791

Table 4.10 above shows that the lowest cost per positive client identified was for the National Testing days with 247 US\$ per positive client identified and followed by Public Health Facilities at 297 US\$ with the highest cost per positive clients identified at the workplace 3,791 US\$.

#### 4.6.7 Cost per new client tested for HIV infection per HTC Strategy

**Table 4.11: Cost per new client tested for HIV for HTC service delivery strategy FY13**

HTC Strategy	Number of New clients FY13	Total expenditure FY13 (NAD)	Total expenditure FY13 (US\$)	Cost per new client identified (NAD)	Cost per new client Identified (US\$)
PHF	85350	45,578,665.08	4,925,293.5	534	58
NTD	0	4,245,310.00	458,753.98	0	0
Standalone	23672	8,508,101.48	919,397.17	359	39
Workplace	94	2,175,091.20	235,043.35	23,139	2,500

Table 4.11 above indicate that the lowest cost per new client tested was recorded at standalone VCT centers at 39 US\$ and public health facilities 58 US\$ with no new clients tested during the National Testing days and the highest cost per new client tested was at workplace 2,500 US\$.

#### 4.7.5. Cost per individuals tested as couples

**Table 4.12: Cost per individuals tested as couples per HTC service delivery strategy FY13**

HTC Strategy	Number of individuals tested as couples FY13	Total expenditure FY13 (NAD)	Total expenditure FY13 (US\$)	Cost per individuals tested as couples(NAD)	Cost per individuals tested as couples(US\$)
PHF	9606	45,578,665.08	4,925,293.5	4745	513
Standalone	4319	8,508,101.48	919,397.17	1970	213
Workplace	0	2,175,091.20	235,043.35	0	0

Table 4.12 above indicate that the lowest cost per individuals tested as couples were recorded at standalone VCT centers at 213 US\$ and the highest were recorded at Public health facilities 513 US\$ and no couples tested at workplaces. NTD couples data not available for analysis.

#### 4.8 Summary of Cost per Client

The lowest cost per client tested was recorded for NTD at 10 US\$ followed by Public Health Facilities at 23 US\$ per client tested with the highest cost per client tested recorded at the workplace with 344 US\$. National Testing Day also recorded the lowest cost per positive client identified at 247 US\$ followed by Public Health Facilities at 297 US\$ with the highest cost per positive identified recorded for workplace with 3,791 US\$. The lowest cost per new client tested was recorded for Standalone at 39 US\$ followed by Public health Facilities (58 US\$) with the highest recorded at workplace 2,500 US\$. Finally, the lowest cost per couples tested was recorded for standalone at 213 US\$ and the highest recorded at PHF with 513US\$ and no couples tested at workplace.



## **CHAPTER 5**

### **CONCLUSION, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY**

#### **5.1 INTRODUCTION**

Chapter 4 presented the results of the study and discussions making comparisons to other research studies. Whereas this chapter outlines the conclusions of the study, the limitations that were encountered, and recommendations based on the findings of the study.

#### **5.2 CONCLUSIONS FROM THE STUDY**

The purpose of the study was to determine the cost of delivering HTC services as well as to determine the effectiveness of different HTC strategies. To achieve this , the following objectives were formulated: the first was to describe HTC output data across HTC service delivery strategies the second was to describe input costs per HTC service delivery strategy and the last was to calculate and compare the cost per client tested for HIV delivered using different HTC strategies disaggregated by: 1.cost per positive HIV individuals identified for each service delivery strategy; 2.cost per new client tested for HIV infection for each service delivery mode 3.cost per couples tested for each service delivery strategy.

##### **5.2.1 Conclusion for Objective 1: To describe HTC output across HTC service delivery strategies:**

Results indicated that 72% of all HIV tests reported to the Ministry of Health and Social Services (MoHSS) were conducted at Public Health Facilities

(PHF). National Testing Day (NTD) and Standalone facilities conducted 15% and 12% of the tests respectively with workplaces recording the lowest proportion of 0.9%. The highest HIV positivity rate of 21% was identified at workplaces followed by PHF with 9% and 5% for NTD. Workplace had the highest proportions of males tested with 65% and standalone facilities reached the highest proportion of couples tested at 18%. PHF presents the best strategy to reach more clients. Workplace HTC services have significant potential to reach men who are hard to reach through mainstream services and are more likely to be HIV positive. Standalone HTC strategies have potential to reach more couples.

### **5.2.2 Conclusion for Objective 2: To describe HTC input costs across HTC service delivery strategies:**

High expenditures are recorded for salaries and fringe benefits for most of the HTC strategies except for National Testing Day and Public Health Facilities. NTD utilize existing staff and infrastructure therefore very little funds are expended to pay for additional hours worked. Public Health facilities show some efficiency as well and could be attributed to the recruitment of lay counselors to do testing in public health facilities. There is also very high cost experienced for recurrent goods mostly for procurement of HIV Rapid Testing Kits across all HTC strategies in relation to other cost categories. There is potential for saving substantial costs on procurement of test kits for Namibia by adopting the WHO recommendations for countries with generalized HIV epidemics with more than 5% HIV prevalence to consider a serial testing algorithm instead of a parallel testing algorithm (WHO, 2015).

### **5.2.3 Conclusion for Objective 3: To and compare the cost per client tested for HIV delivered.**

The lowest cost per client tested was recorded for Public Health facilities at 23US\$ with the highest cost per client tested recorded at the workplace with 344US\$. The estimated cost per HIV positive client identified indicated that NTD and PHF recorded the lowest cost with 247 US\$ and 297 US\$ respectively. However NTD show a low number of first time testers which indicate that this strategy needs to be improved to find more first time testers.

Standalone and workplace had the highest cost per positives identified at 718 US\$ for Standalone and 3,791 US\$ Workplace respectively. Standalone facilities had the lowest cost per new client tested 39 US\$ and couples identified at 213US\$. Standalone facilities were effective in reaching more couples and first time testers at a lower cost. Although workplace identified more HIV positive males the cost at which these services are delivered is very high.

In conclusion, PHF reach more clients with HTC and was effective in identifying HIV infected people at a lower cost in Namibia. However, there is a need to complement this strategy with the other service delivery strategies whose efficiency needs to be strengthened in order to remain relevant in contributing to the National HTC strategy.

### **5.3 RECOMMENDATIONS**

#### **5.3.1 Introduction**

There are several recommendations which originated from this study. These recommendations for the Ministry of Health and Social as well HTC implementing partners are to provide insight in the cost and effectiveness of HIV Testing Counseling service delivery Strategies as well recommendations on further research.

#### **5.3.2 RECOMMENDATIONS**

- The MoHSS should consider expediting the expanded implementation of Provider Initiated HIV Testing and Counseling approach to improve on the identification of HIV positives in Public Health facilities to maximize on this strategy's ability to test majority of clients.
- Workplace programmes should consider exploring alternative implementation modalities to maximize on their potential to reach men who are hard to reach through mainstream services and are more likely to be HIV positive.
- Standalone programming should consider alternative implementation modalities to improve efficiency while strengthening their ability to reach more couples and first time testers.
- The MOHSS and HTC implementing partners should consider improving on efficiency of the NTD strategy by better targeting for NTD's to find new HIV positive clients.
- The MoHSS should consider the introduction of serial testing algorithm to reduce cost for HIV Rapid Test kits as per WHO normative guidance for low and middle income countries.

- HTC partners should consider the integration of other Health services with HIV Counseling and Testing to reduce cost per clients tested, and possibly save cost on salaries and fringe benefits.
- HTC partners to ensure that they keep updated financial information and report regularly.
- HTC partners to migrate financial and reporting systems to the Government financial year

### **5.3.3 Recommendations for future research**

- Further HIV Testing and Counseling programme opportunity cost analysis studies recommended

## **5.4 STUDY LIMITATIONS**

The following were the limitations pertaining to this study:

- Tonateni New Start Center Output data not available – excluded from the study

Existing databases for the Standalone sites and workplace programmes for the period April 2012- March 2013 did not have complete data hence the researcher had to utilize monthly summary forms.

- Monthly summary forms especially for Workplace data were not accurately Computed
- National Testing day couples data not available.
- Financial expenditures for Financial Years April 2010-March 2012 were not available.
- There was a difference in fiscal years of different organizations noted and as a result data had to be extracted from existing financial databases for the period April 2012-March 2013 hence an overlap of costing data for some periods.

- Financial records not readily available and incomplete. This is a finding also highlighted in the (MoHSS 2014) National AIDS spending assessment.
- HTC QA expenditure data and HIV Rapid Testing training data not obtained from partner organizations.
- Not all the workplace data included: only NABCOA financial data, hence only NABCOA input data was utilized.

## **5.5 SUMMARY OF THE STUDY**

The purpose of the study was to determine the cost of delivering HTC services as well as to determine the effectiveness of different HTC strategies in Namibia to inform program implementation and efficient resource utilization. The study thus sought to describe HTC output data, input costs per HTC service delivery strategy as well as to calculate and compare the cost per client tested, cost per positive HIV individuals identified, cost per new client tested and couples tested for each service delivery strategy. This is a quantitative non experimental, retrospective descriptive research study design. A retrospective review of HTC service and expenditure records was done for the Namibian Government (GRN) Financial Years 2010/11-2012/13. Data was analyzed using Epi info version 7.

This study found that PHF reached most of the HIV Testing clients at a lower cost whereas workplaces identified the highest proportion of men with higher positivity however the service costs for this strategy is very high. Standalone facilities reached the highest proportion of couples whilst NTD had the lowest cost per positive client however they had a high number of repeat testers. This study therefore concludes that PHF reach more clients with HTC

and was effective in identifying HIV infected people at a lower cost in Namibia. However, there is a need to complement this strategy with the other service delivery strategies whose efficiency needs to be strengthened in order to remain relevant in contributing to the National HTC Strategy.

The key limitations of the study are that it did not include all HTC strategies and costing data was not readily available. However this study contributed to the body of literature in Namibia in providing an initial investigation of cost and effectiveness of different HTC strategies on a national scale in a time where programmes are challenged with ensuring sustainability coupled with the increasing urgency to identify HIV positives. Secondly, this study may assist programmers in their prioritization given the limited available resources. Finally, this study therefore recommends that more detailed cost effectiveness studies be done.

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## ANNEXURES

### ANNEXURE A: UNIVERSITY OF NAMIBIA POST GRADUATE COMMITTEE APPROVAL LETTER

(+264 61) 206 3111  
Website: [www.unam.na](http://www.unam.na)



340 Mandume Ndemufayo Avenue  
Private bag 13301  
Windhoek  
NAMIBIA

Inspiring minds & shaping the future

#### RESEARCH PERMISSION LETTER TEMPLATE

Date: 02 July 2014

#### TO WHOM IT MAY CONCERN

#### RE: RESEARCH PERMISSION LETTER

1. This letter serves to inform that student: **Ismelda Pietersen** (Student number: **9832770**) is a registered student in the Department of **Public Health** at the University of Namibia. His/her research proposal was reviewed and successfully met the University of Namibia requirements.
2. The purpose of this letter is to kindly notify you that the student has been granted permission to carry out postgraduate studies research. The School of Post- graduate Studies has approved the research to be carried out by the student for purposes of fulfilling the requirements of the degree being pursued.
3. The proposal adheres to ethical principles.

Thank you so much in advance and many regards.

Yours truly,

Name of Main Supervisor: Dr S. Kuugongelwa

Signed: 

Dr. C. N.S. Shaimemanya

Signed: 

Director: School of Postgraduate Studies

Tel: 2063523

E-mail: [cshaimemanya@unam.na](mailto:cshaimemanya@unam.na)

## ANNEXURE B: ETHICAL APPROVAL FROM THE UNIVERSITY OF NAMIBIA POSTGRADUATE COMMITTEE



### ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: SEC/SonPH/42/2014

Date: 23 June, 2014

This Ethical Clearance Certificate is issued by the University of Namibia Research Ethics Committee (UREC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the Faculty/Centre/Campus Research & Publications Committee sitting with the Postgraduate Studies Committee.

**Title of Project:** Cost And Effectiveness Of The HIV Counseling And Testing Service Delivery Strategies in Namibia

**Nature/Level of Project:** Masters

**Principal Researcher:** Ismelda Pietersen(Student Nr: 9832770)

**Host Department & Faculty:** School of Nursing and Public Health

**Supervisor :** S. Kuugongelwa(Main) P. Angula(Co)

Take note of the following:

- (a) Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the UREC. An application to make amendments may be necessary.
- (b) Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the UREC.
- (c) The Principal Researcher must report issues of ethical compliance to the UREC (through the Chairperson of the Faculty/Centre/Campus Research & Publications Committee) at the end of the Project or as may be requested by UREC.
- (d) The UREC retains the right to:
  - (i). withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,
  - (ii). request for an ethical compliance report at any point during the course of the research.

UREC wishes you the best in your research.

A handwritten signature in black ink, appearing to read 'I. Mapaure', written over a circular stamp.

Prof. I. Mapaure  
UNAM Research Coordinator  
ON BEHALF OF UREC

## ANNEXURE C: MINISTRY OF HEALTH AND SOCIAL SERVICES APPROVAL LETTER

9 - 0/0001



### REPUBLIC OF NAMIBIA

#### Ministry of Health and Social Services

Private Bag 13198  
Windhoek  
Namibia

Ministerial Building  
Harvey Street  
Windhoek

Tel: 061 - 203 2125  
Fax: 061 - 222558  
E-mail: [msimasiku@mhss.gov.na](mailto:msimasiku@mhss.gov.na)

#### OFFICE OF THE PERMANENT SECRETARY

Ref: 17/3/3  
Enquiries: Mr. M. Simasiku

Date: 18 September 2014

Ms. Ismelda Corlia Pietersen  
P.O. Box 10560  
Khomasdal  
Namibia

Dear Ms. Pietersen

Re: "Cost and Effectiveness of HIV Counselling and Testing service Delivery strategies in Namibia".

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
  - 3.1 The data to be collected must only be used for purpose stated in proposal and the permission Requesting letter;
  - 3.2 No other data should be collected other than the data stated in the proposal;
  - 3.3 A quarterly report to be submitted to the Ministry's Research Unit;
  - 3.4 Preliminary findings to be submitted upon completion of the study;
  - 3.5 Final report to be submitted upon completion of the study;
  - 3.6 Separate permission should be sought from the Ministry for the publication of the findings.

Yours sincerely,

  
Andrew Ndishishi (Mr)  
Permanent Secretary

"Health for All"