The feasibility and yield of HIV screening among adult trauma patients attending emergency department At Muhimbili National Hospital Dar Es Salaam, Tanzania

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THE FEASIBILITY AND YIELD OF HIV SCREENING AMONG ADULT TRAUMA PATIENTS ATTENDING EMERGENCY DEPARTMENT AT MUHIMBILI NATIONAL HOSPITAL DAR ES SALAAM, TANZANIA.

By

JumaRamadhani

A Dissertation Submitted in Partial Fulfilment of the Requirement for the Degree of Masters of Medicine in Emergency Medicine of the

Muhimbili University of Health and Allied Sciences
October, 2018

CERTIFICATION

The undersigned certify that they have read and hereby recommend for examination by Muhimbili University of Health and Allied Sciences a dissertation titled **"the feasibility and yield of HIV screening among adult trauma patients attending Emergency Department at Muhimbili National Hospital Dar es salaam, Tanzania"** in (partial) fulfilment of the requirement for the degree of Masters of Medicine in Emergency Medicine of Muhimbili University of Health and Allied Sciences.



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DECLARATION

AND

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I, **JumaRamadhani** declare that this **dissertation** is my original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award

Signature..... **Date**.....

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DEDICATION

To my beloved family for their love, prayers, support and encouragement over the years.Thank you for understanding that I had to stay away from you so as I can achieve this important milestone in my life.

I would like to dedicate and express my deepest appreciation to my aunt, Miss ChausikuJuma for believing in me, loving me and for her support.

ABSTRACT

Introduction: Human Immunodeficiency Virus (HIV) remains the major global health problem, affecting over 36.7 million people, causing over 1.1 million deaths in 2015. In Tanzania, the prevalence of HIV was estimated to be 4.8% by the end of August 2017. The World Health Organization (WHO) and Tanzanian National Guidelines for HIV and acquired immune deficiency syndrome (AIDS) management, require provider initiated testing and counseling for HIV at the point of contact, however there has been no study done in Tanzania looking the feasibility of routine HIV testing and its yield in among acutely ill patients in the Emergency Department (ED).

Aim of the study: The objective of the study wasto determine the feasibility and yield of HIV screening among adult trauma patients attending the Emergency Department (ED) at Muhimbili National Hospital (MNH).

Materials and Methods: This was a prospective cohort study of consecutive adult trauma patients presenting to ED-MNH between March 2017 and September 2017.Eligible patients who consented to be in the study received pre and post HIV testing counseling by a trained research assistant. They were asked if they would undergo point of care (POC) HIV testing. Testing was done as per the current Tanzanian National Guidelines for HIV and AIDS Management.A finger prick blood sample was tested with SD Bioline; a negative result was recorded as free of HIV, and all positive results were confirmed by a positive POC UNIGOLD test. Negative UNIGOLD tests were considered inconclusive and confirmation was done by taking their blood sample to the central laboratory for HIV ELISA testing.Structured case report forms were completed, documenting demographic information, acceptability of the test, test results and readiness to receive test results.The study data was summarized with descriptive statistics, including means and standard deviations, medians and interquartile ranges (IQR), counts, percentages, and 95% confidence intervals, as appropriate.

Results: We enrolled326 (11.5%)out of 2,848 trauma patients screened for eligibility to participate in study.The median age was 33 (IQR 25-42 years) and 248 (76.0%) patients were male.Of those enrolled in the study, 250 (76.7%) patients agreed to be tested for HIV, and 247 (98.8%) were ready to receive their test results after testing. Out of those tested, 14 (5.6%) tested positive for HIV at EMD. None of the enrolled patient were tested for HIV by the physician as part of their regular care.Two months post hospital discharge, 6 (42.8%), of the HIV positive patients had attended Care and Treatment Clinics (CTC) for HIV treatment.

Conclusion & Recommendations: Routine HIV screening among adult trauma patients is feasible, acceptable and results in identification of previously undiagnosed cases of HIV and subsequent follow up in continuous HIV and AIDS care. Future studies should focus on factors affecting the linkage to CTC among HIV positive patients identified at the ED.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AMS	Altered Mental Status
ARV	Antiretroviral Treatment
CITC	Client Initiated HIV Testing and Counselling
CTC	Care and Treatment Clinics
ED	Emergency Department
ELISA	Enzyme-linked Immunosorbant Assay
EMD	Emergency Medicine Department
GCS	Glasgow Coma Scale
HDI	Haemodynamic instability
HIV	Human Immunodeficiency Virus
HTC	HIV Testing and Counselling
IRB	Institutional Review Board
MNH	Muhimbili National Hospital
MUHAS	Muhimbili University of Health and Allied Sciences
PITC	Provider Initiated Treatment and Counseling
PLHIV	People Living with HIV
SPSS	Statistical Package for Social Science
TB	Tuberculosis
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

DEFINITION OF TERMS

1. **Adult person**

   Person above 18 years old

2. **AIDS**

   Disease of immune system, characterized by increased susceptibility to opportunistic infections

3. **Acceptability**

   Pleasing to receive, agreeable, satisfactory

4. **Altered mental status**

   General changes in brain function such as confusion, memory loss, loss of alertness, disorientation, defects in judgment or thought, unusual or strange behavior.

5. **Feasibility**

   How easy or difficult it is to do some thing

6. **SD Bioline**

   A rapid and point of care diagnostic test for HIV

7. **Trauma patient**

   A person who has suffered a physical injury that might be minor, serious or life-threatening.

8. **Uni-gold**

   Range of rapid point-of-care test devices consists of high-quality, single use immunoassays to aid in the diagnosis of HIV.

1. Background

1.1 Introduction

HIV continues to be a major world public health problem, having claimed more than 35 million lives so far. In 2015, over 1.1 million people died from HIV-related causes globally(1).

There were about 36.7 million people living with HIV at the end of 2015 with 2.1 million people becoming newly infected with HIV in 2015 in the world.(1)An estimated 0.8% [0.7-0.9%] of adults aged 15–49 years worldwide are living with HIV, although the burden of the epidemic continues to vary considerably between countries and regions(2)
Sub-Saharan Africa is the most affected region; in 2015 there were 25.6 million people living with HIV. Sub-Saharan Africa accounts for two-thirds of the global total of new HIV infections.(1)

Globally the most affected groups are men having sex with men, prostitutes, intravenous drug abusers and uncircumcised men. (3–7)

About 1.4 million people are living with HIV (PLHIV) in Tanzania, with prevalence of 4.8%(8). In 2015, 54,000 people were newly infected with HIV mainly between the age group between 15-49 years, and 36,000 people died from an AIDS-related illness.(7,9)Heterosexual intercourse is the main mode of transmission and women being at a higher risk of infection than men.(7). The risk groups are female prostitutes, but also y men having sex with men, intravenous drug abusers, and uncircumcised male are at high risk.(7) It is estimated that 21%-30% of PLHIV in Tanzania have registered at CTC, and 69% of eligible adults are receiving anti-retroviral therapy (ARVs).(7)

HIV and AIDS reduce economic growth and therefore hinder the ability of countries and individuals to sustain adequate responses to the epidemic, due to a weak economic base.(7) HIV and AIDS appear to affect more of the population that is economically and socially disadvantaged, including women, youth and other marginalized groups.(7) AIDS is widespread in both urban and rural communities and affects persons at the peak of their

productive lives. Their death means loss of family's main source of income.(7)Poor health status and death due to AIDS are reported to have reduced the agricultural working force,production and disposable incomes in many families and rural communities.(7)

The HIV/AIDS pandemic interacts with other underlying public health problems, particularly tuberculosis (TB), which is one of the principal causes of death in persons with HIV infection. TB was initially well controlled, but since the arrival of HIV, e TB cases have risen more than six folds.(7)

The World Health Organization (WHO), and Tanzanian National Guideline for Management of HIV and AIDS recommend routine HIV testing in all health facilities.(7, 10). Of all people living with HIV at the moment globally, it is estimated that only 60% know their status. The remaining 40% or over 14 million people need to access HIV testing services(1). Through provider initiated testing and counseling, people living with HIV might be identified early and they can then be enrolled into the management system(10). In Tanzania, people access HIV treatment, care, support and prevention services through means of HIV testing and counseling.(7)All forms of HIV testing and counseling are done voluntary and adhere to the five C's: Consent, Confidentiality, Counseling, Correct test results and Connections to care, treatment and prevention services.(7) The HIV testing and counseling (HTC) follow the following approaches,

*Provider Initiated Testing and Counselling (PITC)**:***Through PITC, the health care providers offer *HTC* to individuals, couples, families, or groups attending clinical services in public or private health facilities.(7)It is recommended that health care providers recommend HIV testing as a standard of care to all patients attending a health care facility regardless of whether they have sign or symptoms of HIV infection.(7) This allows health care providers to make specific medical decisions that would not be possible without knowledge of the patient's HIV status.(7)

*Client Initiated HIV Testing and Counselling (CITC)**:***In this approach, also known as Voluntary Counselling and Testing (VCT), client(s) voluntarily make the decision to learn their HIV status as an individual, couple, or family and seeks counselling and testing services out of his or her own will for the purpose of prevention of HIV infection and personal life decision making.(7)

Community-Based HIV Testing and Counselling: HIV testing and counselling can be offered in a variety of settings including home-based testing, mobile outreach (including in workplaces, schools, universities, special testing campaigns and events) and multi-disease campaigns tailored to epidemiological and social contexts.

HIV screening should be offered to patients whenever they are attending clinical services in the public or private health facilities.(7). EMD as the point of entry for clinical service has the role to accomplish that goal. Offering routine HIV screening in Emergency department care is a good opportunity to identify people with HIV infections who otherwise would not seek care. By knowing their status they may change their sexual behaviours and get enrolled in HIV management systems.(11)In other countries, a good number of positive HIV patients who have been unaware of their status have been identified through the provider initiated testing and counselling done at the EMD.(12,13)Subsequent attendance to HIV clinics by those new HIV positive patients identified at the EMD has been satisfactory.(11, 13)

Routine HIV screening testing at the EMD provides an opportunity for early recognition of positive HIV patients.(1, 15) Identifying them early will provide the opportunity of initiating treatment early so as to stop the progression to AIDS.(14) Also they will be able to find means of protecting their partners since they are now aware of their HIV status(14)

About a quarter of all patients attending acute settings in Tanzania are trauma patients. These traumas result a from motor vehicle accidents, motorcycle accidents, pedestrians versus automobiles, assaults, gunshot wounds, falls and burns.(15)The existence of HIV among trauma patients attending our acute setting is very significant in several ways. A substantial risk of exposure to HIV exists in health workers who care for these patients.(16)For trauma patients needing both surgical and non-surgical management, their HIV status may determine the speed of recovery; HIV positive trauma patients with low CD4 have slower recovery.(17).Trauma patients are also at risk of transmitting HIV from one to another during their transport to hospital. (18)

1.2 Literature review

Studies on the feasibility of HIV screening in acute setting have been done all over the world, and all of them have shown that it is feasible to have HIV screening tests in the emergency departments.

A study done by Nakanjako, D. et al. at the Emergency Department ofMulagoNational Referral Hospital in Uganda assessing the acceptance of HIV screening test and its yield, showed that 95% accepted testing. Half the patients were HIV infected and 77% of these were newly diagnosed during the study.(12)Another study conducted in Zambia by Stephanie M Topp et al in 2004 which examined Opt-out provider-initiated HIV testing and counseling in primary care outpatient clinics in Zambia, showed that of41 861 approached for HIV testing, 31 197 (75%) agreed to be tested(10)

Despite a wide acceptance rate, other studies have shown challenges still exist. In the study identifying barriers to HIV testing done by Sandra Schwarcz et al, at the San Francisco Department of Public Health in USA, fear was the most frequently cited barrier to testing. Other barriers included being unaware of improved HIV treatment.(19)In another study done by Jeffrey L. et al which looked at reasons for refusal of HIV testing found that the main reason for refusal to have the test was that the patients thought that they were not at risk of acquiring the virus.(20)

The yield of routine HIV screening studies has provided a substantial number of HIV positive patients among those participatingin the studies. A study that determined initial Outcomes of an Emergency Department Rapid HIV Testing Program in Western Kenya done by Michael Jay Waxman, M.D. and published in 2007, showed that among1339 patients tested for HIV, 312 (22.7%) were HIV positive(13)

Studies have shown that even in areaswith very low prevalence of HIV, routine HIV testing has produced a great deal in terms of yield. In the study conducted in Washington DC in 2006 by Jeremy Brown, MD et al, which evaluated a program of routine HIV Screening in the Emergency Department, found that 2476 accepted the HIV test and 9 of them were confirmed to be HIV positive(21).

Studies have shown that, people who are diagnosed to be HIV positive during the time of the routine HIV testingenroll intoHIV clinics. A study in Kenya in 2006 by Michael Jay Waxman et al found that 82% of people found to be positive during the study were compliant with their initial HIV clinic visit and 65% were compliant with a 1-month follow-up visit.(13)Again in the study done in Washington DC in 2006 by Jeremy Brown, MD, all 9 patients who were confirmed be HIV positiveon routine screening in the ED were successfully linked to follow up care.(21)

In most studies, routine screening for HIV has been shown to yield more cases of positive HIV patients than physician selective testing. A study that compared routine, opt-out HIV screening with the expected yield from physician-directed HIV testing in the ED done in Minneapolis in USA by Matthew E. Prekker, MD, MPH et al, showed that routine testing yielded 9 new HIV cases; only two of the positive cases would have been diagnosed by physician-selective test ordering.(14).

2. Problem statement

HIV and AIDS still affect many people worldwide, particularly in Sub-Saharan African countries. A large proportion of the people living with HIV do not know that they are carrying the virus. This has led to delay in their diagnosis and therefore they are at high risk of developing AIDS. With development into AIDS, they became sicker with increased chance of dying. When they are sick, they use more resources for their treatment from the government, increase the burden to their family and, since HIV tends to affect more young people, there is loss of manpower from the family and the national economy. Additionally, by not knowing their HIV status, these individuals are more likely to transmit the virus to their partners because they use fewer measures of protection.

The WHO and Tanzanian National Guidelines for HIV and AIDS management require provider initiated testing and counseling for HIV through all heath facilities, however it has been previously shown that provider-selective testing will not always identify the best people to be tested. There has been no study done in Tanzania looking at the feasibility of routine HIV testing and its yield in Emergency departments.

3. Rationale

People living with HIV but who donot know their status needs to be identified early and receive treatment. The study aimed to determine if itis possible to create a protocol at the emergency department that would allow every patient attending the department to be counseled for taking the HIV test. It is not known if such a program would be acceptable to patients, feasible to carry out, and whether this results in a sufficient number of new diagnoses to make the program worthwhile. The study would also determine if routine testing identifies HIV positive patients who would be missed by the physician's decision about who needs to be tested. The study will provide evidence on whether the government shouldadvocate for a National policy that would require routine HIV testing in all Emergency departments in the country. The study will also provide opportunity for more research on HIV in general.

Currently, HIV testing is often initiated by providers when patients are medically ill but not necessarily on otherwise healthy individuals. The main reason for selectingtrauma patients in the study was that trauma patients represent those people who would attend to hospital due to non-medical reasons. They were not previously ill (usually) and physicians are less likely to consider the need to test them. Determining the acceptability and yield of HIV testing in this group can indicate whether routine testing should be instituted universally to all patients.

Also knowing the prevalence of HIV among trauma patients would help the clinicians to take extra measures to protect themselves when attending trauma patients. Many of these patients require surgical interventions.

And lastly, knowing the prevalence of HIV among trauma patients will help to create proper means of transporting trauma patients so as to reduce chance of HIV transmission to ambulance personnel (Paramedics).

4. Research questions:

1. What isthe feasibility ofHIV screening among adult trauma patients attending Emergency Medicine Department of Muhimbili National Hospital?
2. What is the yield of HIV screening among adult trauma patients attending Emergency Medicine Department of Muhimbili National Hospital?

5. Objectives

5.1 Broad objective:

To determine the feasibility and yield of HIV screening among adult trauma patients attending Emergency Department at Muhimbili National Hospital

5.2 Specific Objectives:

I. To determine the proportion of trauma patients attending EMD who accepted the HIV screening Test and were ready to receive the test results

II. To determine the yield of HIV screening test for trauma patients attending EMD at MNH

III. To determine whether routine HIV screening identifies more patients with disease than if tests are ordered according to physician judgment.

IV. To determine the proportion of trauma patients who tested positive for HIV screening testself-reported to attend CTC two months after discharge from Hospital.

6. Methodology

6.1 Study design

This wasa prospective cohort study of adult trauma patients arriving at the Emergency Medicine department of Muhimbili National Hospital from March 2017 to September 2017.

6.2 Study area

This study was done at the emergency medicine department (EMD) of Muhimbili National Hospital. Muhimbili National Hospital (MNH) is a tertiary hospital located in Dar es salaam, Tanzania. It has a bed capacity of 1,500 with around 1,000 to 1,200 admissions per week, operating 24 hours in day.The MNH-EMD is the first public ED in the country and was opened in 2010. It is staffed with emergency physicians, postgraduate students in emergency care training program, medical officers, critical care nurses and nursing officers. Emergency medicine department is the first entry to the hospital for most of the patients attending Muhimbili national hospital, seeing around 200 patients daily. Acutely ill patients are received at ED, are resuscitated and stabilized before being disposed to the appropriate ward. Currently HIV testing at the ED is done based on physician discretion.

6.3 Target Population:

Healthy adultpatients attending acute care settings/emergency departments in Tanzania. .

6.4 Accessible Population:

Adult trauma patients attending Emergency Department ofMuhimbili National Hospital during the time of the study.

6.5 Study population

Adult trauma patients attending Emergency Medicine department at Muhimbili National Hospital meeting the inclusion criteria and arriving at the time that the researcher is present.

6.6 Subject

Selection criteria

Inclusion criteria; adult trauma patients attending Emergency Department at Muhimbili National Hospital

Exclusion criteria;

- Those below 18 years
- Those with altered mental status(AMS)
- Those that cannot speak English or Kiswahili
- Those who are known to have HIV infection as evidenced with HIV treatment card or history (information volunteered by the patient)
- Pregnant women already attending Antenatal clinics.
- Hemodynamic instability (HDI) – defined by physician.

6.7 Variables

Demographic data: age, sex, marital status, education, occupation, referral status

HIV Test results and reachable patients telephone numbers.

EM Physician order for HIV testing

6.8 Outcomes

Main outcome: Acceptability: the proportion of patients willing to take the test.

Secondary outcomes

- Readiness to receive results
- Yield (proportion of HIV positive cases
- Yield of physician-directed testing
- Reported follow up attendance at a CTC clinic

6.9 Sample size

The sample size calculationswere based on the estimated acceptability of HIV testing. This estimate was taken from a study byStephanie M Topp et al in 2004 “Opt-out provider-initiated HIV testing and counseling in primary care outpatient clinics in Zambia”(10). In that study 41 861 were approached for HIV testing. Of these patients, 31 197 (75%) agreed to be tested.

The sample size formula for confidence interval of a proportion:

$N=4P(1-P)/e2$

Where:

N = estimated sample size,

P = expected proportion, which is 0.75

e = the margin of error, which is 0.05

From that formula, the expected sample size is 315

Thus the minimum sample size will be **315x10% = 346**

The 10% addition done to account those patients who will be lost to be followed up.

6.10 Patient recruitment anddata collection

Identification

The research assistant actively went through the resuscitation rooms and treatment areas to identify the trauma patients with the help of resuscitation room and treatment area nurses.

Consent and counselling

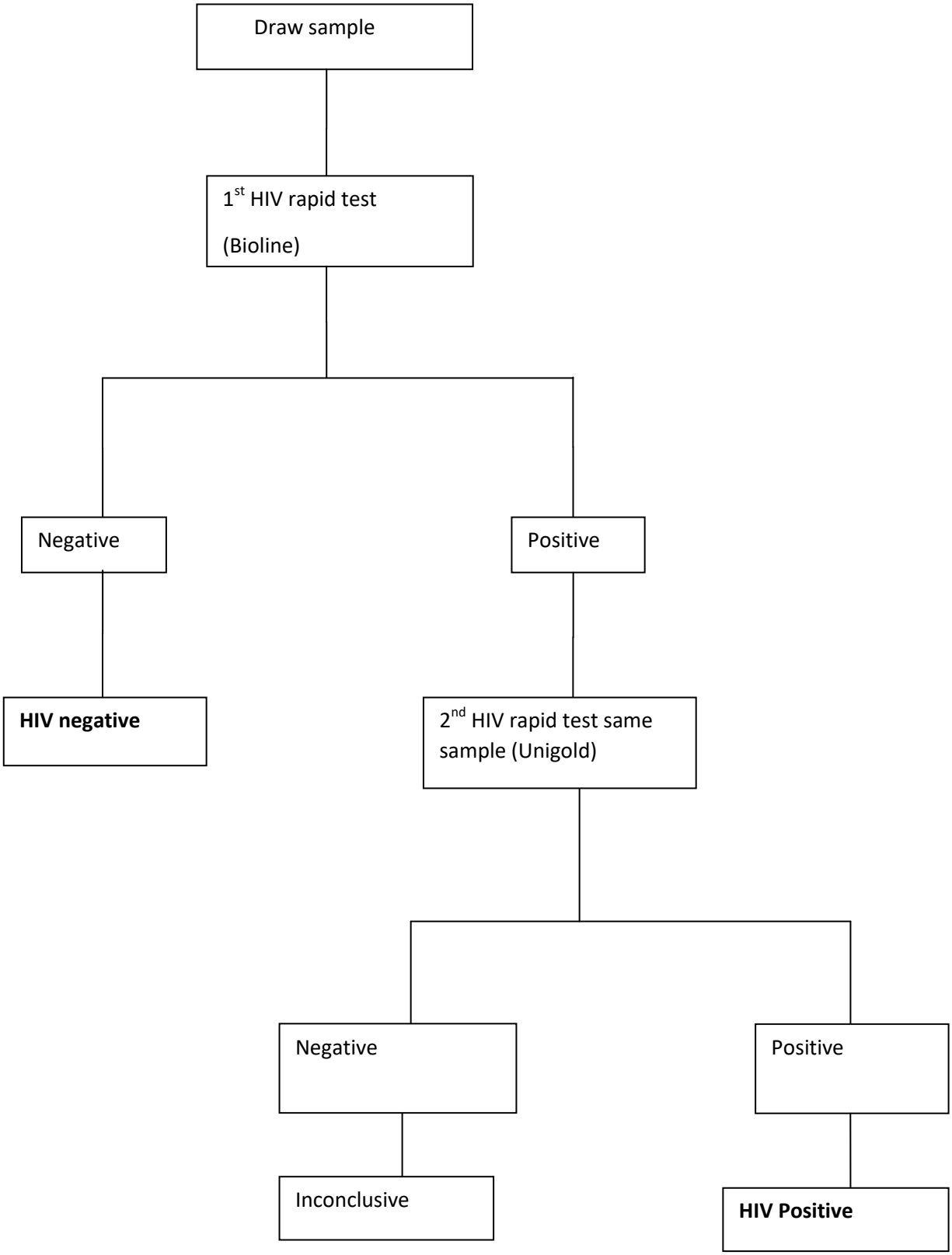
Adult trauma patients meeting the inclusion criteria were offered a chance to participate in the study. After they had received the initial treatment and stabilization, or while waiting for their disposition, patients were reviewed and provided with a written consent to be in the study. Participants then received pre- testing HIV counseling given byan EMD nurse who had training in HIV counseling and testing. Participants were informed that no extra charges would be incurred for the test. Patients could agree or not agree to take the test. Patient privacy and confidentiality was carefully observed before and after testing regardless of the test results.

Testing

Testing was done as per 2016 National Guidelines for HIV and AIDS Management. Blood sample was collected using finger pricks. The SD BIOLINE test was the first testing tool, those with SD BIOLINE test negative were considered free of HIV. For those with SD BIOLINE test positive, a second gold standard “UNIGOLD” test was used as the confirmatory test. Those with UNIGOLD test positive were considered to have HIV infection. A negative UNIGOLD test was considered inconclusive, and confirmation was done by taking their blood sample to the central laboratory for HIV ELISA testingand results received the same day.

Both SD BIOLINE and UNIGOLD test against the HIV antibody and Identify HIV1 and HIV 2 antibodies.

Tanzania National Testing Algorithm for persons Aged more than 18 months as reported by the Tanzania Guidelines for HIV and AIDS management.



Post testing counseling

Post testing counseling was done before test results were provided.Patients were asked for their readiness to receive the test result.For those who were ready to receive test results, results were provided to them. Those who were not ready to receive the test results were counseled to come back to the department at any moment that they would be ready to receive the test results, and were also told they can always go to the nearby health facilities of their choosing to be tested for HIV again whenever they are ready.

Those who were willing to receive their results and were positive for HIV were instructed to attend CTC and other HIV treatment centers for further assessment and care after their discharge from the Hospital with special referral forms explaining their HIV results were.

Provider-selected testing

For each patient, the electronic health record (Wellsoft) was reviewed to determine if the treating physician had ordered an HIV test. The number HIV positive cases detected by the EMD physician were compared with the number of HIV positive cases detected by routine testing during the study. This was done so as to determine how many trauma patients were offered HIV testing by the physician who was treating them and the reasons for such test to be offered.

Feasibility

During whole period of study, all patients who agreed to be tested received the test. The testing kits were available all the time.

Follow up

HIV positive patients were contacted by telephone two months after their discharge to ask if they had made a visit to CTC as they were instructed.

6.11 Electronic Data

Data from questionnaires were entered into Microsoft® Excel® 2013 sheet and later on transferred to Statistical Package for Social Sciences® (SPSS) for analysis.

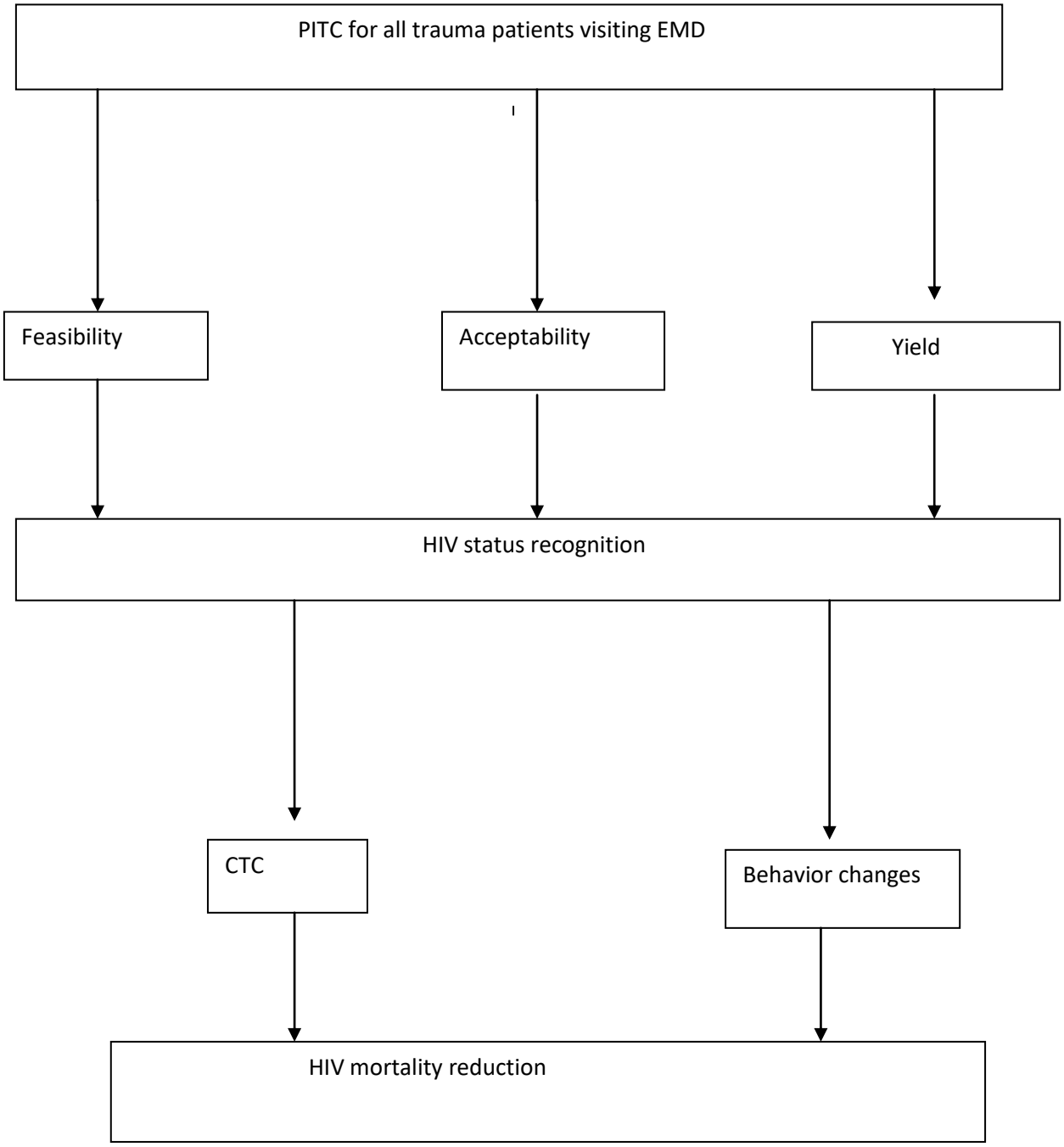
6.12 Data Analysis

Patient descriptive characteristics were reported. The proportion of trauma patients accepting the HIV testing was calculated from the enrolled adult trauma patients accepted to test divided by the total number of all adult trauma of patients approached who enrolled in the study.. The yield was the proportion of those tested positive among those who accepted testingand was calculated by dividing the adult trauma patients who tested positive for HIV by the total number of all adult trauma patients who accepted the test. The data wasanalyzed by SPSS

6.13 Ethical Clearance

This study was conducted after approval from the MUHAS IRB and permission from MNH. Data collection was only done after a patient hadgiven written consent to participate in the study. The structured questionnaires were identified by serial numbers and patient's medical record number and not patient's name. The use of medical record number was for tracking the patient's information related to the study in case of the need to revisit their medical record for missing information or correctness. The completed case report forms werekept by the principal investigator and not sharedfor any reason.

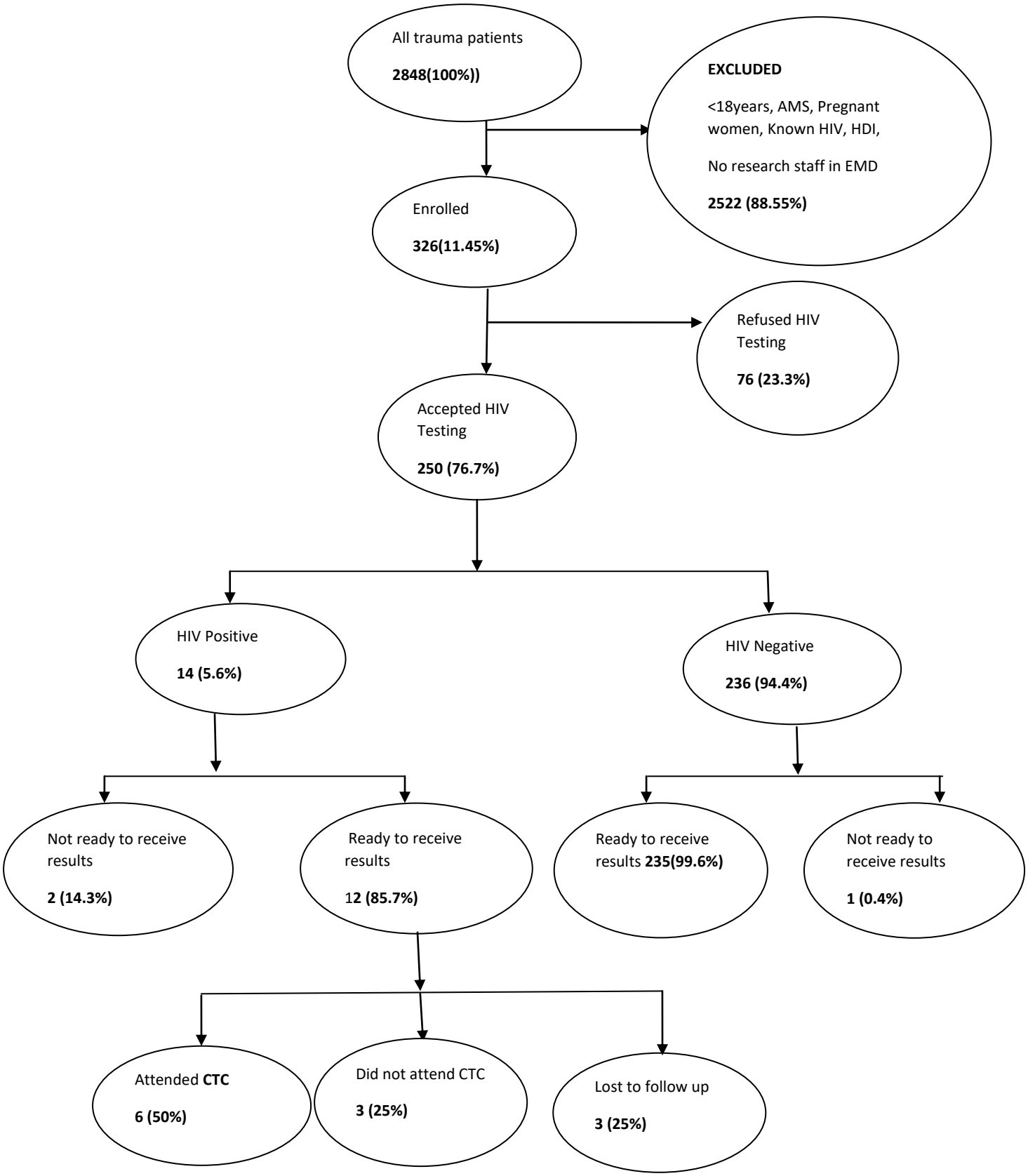
6.14 Conceptual Framework



10.0 RESULTS

During the study period 2848 trauma patientspresented to the EMD. During the period in which the researcher or assistant was present, 326 patients (11.45% of all trauma patients) met the inclusion criteria. Of them consented for participation in the study.After they received pre HIV testingcounselling, 250 patients (76.7%) agreed to be tested,and among them 14 patients (5.6%) tested HIV positive. Of those that tested positive,6 of them reported to be attending CTC when contacted two months after their discharge and they were already on ART. Ofall 14 HIV positive patients, none of them was identified by the physician who was providing care for these trauma patients.**(Figure 1)**

.Figure 1: Flow chart for HIV screening among adult trauma patients attending ED of MNH



10.1. Demographic characteristics

A total of 326 adult trauma patients were enrolled, 248 (76%) were male, 245 (74%) were in the age group of 18 to 42 with the median age 33 years (IQR 25-42 years). 136 (48%) were referred from other hospitals to MNH. 173 (53%) were unemployed and 224 (69%) had no further education beyond primary school.

Table 1: Demographic characteristics of trauma patients approached for an opt out HIV screening attending at EMD of MNH

Variable	Frequency
Sex	N (%)
Male	248 (76%)
Female	78 (24%)
Age groups	**N (%)**
Median age (IQR)	**33 (25-42)**
18-31	145 (44%)
32-41	100 (31%)
42-53	51 (16%)
54-66	19 (6%}
>66	11 (3%)
Referral status	
Not Referred	190 (52%)
Referred	136 (48%)
Marital status	**N (%)**
Married	154 (47%)
Single	160 (49%
Divorced	5 (2%)
Widowed	7 (2%)
Unknown	
Occupation	**N (%)**
Public or private servant	102 (31%)
Unemployed	173 (53%)
Petty trader	32 (10%)
Student	15 (5%)
Others	4 (1%)
Education level	**N (%)**
Primary education	224 (69%)
Secondary education	73 (22%)
College/University education	21 (6%)
No formal education	8 (3%)

10.2 Acceptance and readiness to receive test results.

Of 326 patients enrolled and counseled for HIV testing, 250 patients (77%) accepted testing. Among males, 69% accepted the test while all female (100%) accepted the test. 247 (98.8%) of tested patients were ready to receive their test results. Only one male and two females were not ready to receive their HIV test results; all 3 were single, and had not gone beyond primary school andhad been referred from other hospitals to MNH (**table 2-3)**

Table 2: The distribution by gender, age, marital status and referral status of trauma patients who accepted the HIV screening and were ready to receive the test results.

Variable	Number (N)	Accepted to be tested for HIV	Ready to receive test results	Test results positive
Overall		n/N	n/N	n/N
Total	326	250 (77%)	247 (98.8%)	14 (5.6%)
Sex				
Male	248	172 (69%)	171(99%)	9(5.23%)
Female	78	78 (100%)	76 (97%)	5(6.41%)
Age group				
18-31	145	109 (76%)	107(98%)	5(4.59%)
32-41	100	78 (78%)	77(99%)	5(6.41%)
42-53	51	41 (80%	41 (100%)	1(2.43%)
54-66	19	15 (79%)	15 (100%)	2(13.33%)
>66	11	7 (64%)	7 (100%)	1(14.29%)
Marital status				
Married	160	127(79%)	127 (100%)	5(3.94%)
Single Divorced Widowed	154 5 7	115(75%) 3(60%) 5(71%)	112(97%) 3(100%) 5(100%)	8(6.96%) 0% 1(20%)
Referral status				
Referred	190	152(80%)	149(98%)	12(7.89%)
Not referred	136	98(72%)	98(100%)	2(2%)

Table 3: The distribution by occupation and education level of trauma patients who accepted the HIV screening and were ready to receive the test results

Occupation	Number (N)	Accepted to be tested for HIV	Ready to receive test results	Test results positive
Public or private servant	102	77 (75%)	75 (97%)	6(7.8%)
Unemployed	173	137 (79%)	136 (99%)	6(4.37%)
Petty trader	32	24 (75%)	24 (100%)	2(8.3%)
Student	15	8 (53%)	8 (100%)	0%
Others	4	4 (100%)	4 (100%)	0%
Education level				
Primary education	224	176 (79%)	173 (98%)	14(7.95%)
Secondary education	73	57 (78%)	57 (100%)	0
College/University education	21	12 (57%)	12 (100%)	0
No formal education	8	5 (63%)	5 (100%)	0

10.3 Yield.

Out of 250 patients who agreed to be tested, 14 (5.6%) tested positive for HIV, 9 (5.23%) were male and 5 (6.41%) were female. **(Figure 1, table 2&3)**

10.4 Self-reported CTC attendance.

Among the 12 HIV positive patients that received results, 6 patients (50%) reported to have made visits to CTC and they were on ARVs, 3 patients (25%) reported to have not gone to CTC due to several reasons. The remaining 3(25%) were lost to follow up; either their phone number were not reachable, or the person answering stated it was the wrong number **(Figure 1)**

10.5 HIV testing as part of regular care.

Of 250 patients tested for HIV during the study, none were tested for HIV as part of their regular care in the emergency department. Therefore, all 14 HIV positive patients would not have been identified by the physician who was providing care for these trauma patients.

11.0 DISCUSSION

In this feasibility study, we found that among otherwise healthy trauma patients, the majority (77%) accepted routine HIV screening, and 98% were ready to receive their results in the same visit. Fourteen patients were found to have a new diagnosis of HIV, an overall yield of 5.7%. Of those who received their results, 50% had attended a CTC within two months of receiving the diagnosis.

The majority of the enrolled patients were young. This was due to the fact that the study involved trauma patients. Younger age people are at greater risk of having trauma because of their daily activities. Similar results for the age of trauma patientshave been shown in studies looking at pre hospital care for trauma patients and the trauma burden in Tanzania (22),(23).Previous studies have also shown that younger age groups are also more likely to have HIV.(24),(25)

Routine HIV screening at Emergency Medicine Department for diagnosing people who are living with HIV, but unaware of their status is feasible, as evidenced by more than 75% of those counseled agreeing to be tested. Mass education and training has helped to raise the awareness of HIV and AIDS and that likely contributed to a good acceptance rate. All female trauma patients approached for routine HIV testing accepted, Similar studies done in different parts of the word have shown that the acceptance rate tends to be higher in women.(24). In our study, theunanimous acceptance rate by women is may be due to the fact that women have more visits to health facilities, including the antenatal and postnatal clinics where HIV education is commonly provided. While some previous studies have shown a high overall acceptance rate as inour study (25), this is not always the case as study done in Singapore showed a very low acceptance rate (26).

In the current study, those who did not accept the test had the following reasons; they had recently tested thus no need to retest, they were not ready, they knew their status (negative), wanted to take care of their primary injuries first, and they were scared (fear). Fear was also seen to be the major barrier to HIV testing in another study which looked on the barriers towards HIV testing.(27) Fear was also seen as the barrier in the study done in Uganda(28)

Almost all trauma patients who accepted testing, were ready to receive their test results. This was probably due to proper pre and post counseling. Similar findings occurred in the study done in Uganda which showed only 4% of patients did not appear for their HIV test result.(29) Another study from Zambia showed that all patients who accepted HIV testing were ready to receive their test results (24).A study done in Uganda showed that of all those who agreed to be tested ,only one person did not come back for his test results (28).

When looking for the readiness of receiving HIV test results among those that tested positive, the study showed that more than 85% of those tested positive for HIV were ready to receive their test results. This shows the readiness to receive the test results is similar among those tested positive and those tested negative. The studies done in Uganda and Zambia did not show any difference in readiness to receive test results among those who tested positive for HIV and those who tested negative.(30),(29)

Of those patients that accepted screening for HIV, almost 6% tested positive. The yield was much higherin comparison with similar studies done in USA(31). Astudy done by Prekker et al in USA showed that out of 2811 people accepted to be tested only 9 of them were HIV positive(25). The obtained yield in our study looks similar to HIV prevalence in the country according to the Tanzanian National Guidelines for HIV and AIDS management which reports the HIV prevalence to be 4.8%(8). Another study done in Singapore showed the yield to be much lower than in the current study(0.18%)(26).Another study done in the USA found that the yield from routine testing was 1.9% new cases of HIV(32).

This study showed that proportion of HIV positive was slightly higher among females and males.The Tanzanian National Guideline for HIV and AIDS treatment reported the prevalence in women to 6.3%compared with 3.9% for men. (33). Similar findings has also been shown by the National Bureau of Statistics.(8) High prevalence of HIV in female comparing to male could be due to biological differences which increase the chance for female to acquire the virus. This study did not show such a large difference between males and females, but not all males agreed to be tested.

One of the important goal for ED HIV screening is to link e newly HIV diagnosed patients to the specialized HIV centers (CTC) for continuous care. In this study, 50% of those who received their results (being HIV positive) went to CTC and reported they were already on treatment.Three others who were reached (25% of positive results), did not go to CTC. This may be due to the fact that the study enrolled trauma patients and they might not had recovered fully and that might be keeping them from attending CTC.However, similar findings were reported in the study done in United States; only56% of newly HIV diagnosed patients attended the specialized centers for HIV(25).Another study done in Kenya showed that 65% of new HIV patients attended HIV clinics (34).Other studies Uganda, Zambia and in Singapore has shown that most of the patients who have tested positive in routine HIV or PITC adhered to the instructions to getenrolled in a clinic(24),(26)(28).

In our emergency department, most of HIV screening is done to assist with diagnosis of a medical disease, and so non-suspicious patients rarely get tested. In this study we found that none of the patients that underwent testingdue to the study would have been tested by the treating physician. In other words, the HIV positive patients identified during the study, would have beenmissed.A study doneon routine HIV testing in USA showed that out 9 patients diagnosed with HIV, only 2 of them would have been diagnosed by the physician.(25). Similar results were also seen in another study conducted in USA which showed most newly diagnosed cases of HIV identified in the ED through routine testing were not admitted to the hospital, and thus would not be identified in a regular hospital care(32)Similar findings were seen in the study done in Uganda(28).

12.0 Study limitations and mitigations measures

This was a single canterstudy which reduces its generalizability. The study excluded children, pregnant women, unconscious and those with hemodynamic instability as well as those in the department when there was no research assistant.Three of the positive patients were lost to follow up, and three did not receive results.

Mitigation measures

1. Muhimbili Emergency Medicine Department receive patients from different areas in the country, so the patient population is likely representative of the country. Many patients were not referred, which is typical for trauma.

13.0 Conclusion

Routine HIV screening among adult trauma patient is feasible, acceptable and identifies new 0cases of HIV, allowing HIV positive patients to be enrolled in CTC for continuous HIV and AIDS care. Future studies should focus on factors that can increase acceptance of testing, and improve the linkage to CTC among HIV positive patients identified at the ED.

14.0 RECOMMENDATIONS

Protocols for routine HIV testing should be instituted at EMD so as to give opportunity for every single patient attending EMD to be tested. This will help to identify those with HIV and get them to CTC for HIV and AIDS continuous care.

Further research is needed to improve acceptance of routine HIV testing and identify reasons for failure to link the identified HIV positiveto CTC

Further research is needed to identify the acceptability and yield of HIV testing among non- traumatic patients attending EMD.

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8. Appendix

8.1 Appendix 1: QUESTIONNAIRE

THE FEASIBILITY AND YIELD OF HIV SCREENING AMONG ADULT TRAUMA PATIENTS ATTENDING EMERGENCY DEPARTMENT AT MUHIMBILI NATIONAL HOSPITAL

Were you involved in any trauma? (a) Yes (b) No

Serial number ……

Hospital registration number ……

Patient self-phone number ……

Place of residence ……

1. Age of the patient ……
2. Eligible for study (a) Yes (b) No
3. Sex (a) Male (b) Female
4. Were you referred? (a) Yes (b) No
5. Marital status (a) Single (b) Married (c) Divorced (d) Widowed (e) Unknown
6. Occupation (a) Public/private sector (b) Unemployed (c) Petty trader (d) Student (e) others
7. Education level (a) P. school (b) S. school (c) College/University (d) No formal Education
8. Can you participate in HIV screening? (a) Yes (b) No

   If 'no' explain why

   I. ……..

   II. ……..

III. ……

IV. ……

9. Have you ever had HIV test before? (a) Yes (b) No

If 'yes' when was the testing done? …….

What was the test results ……..

10. Were you counseled for HIV testing? (a) Yes (b) No

11. Do you agreed to have an HIV test (a) Yes (b) No

If 'no' explain why

I. ……

II. ……

III. ……

12. If 'yes' to question 11 explain why

I. ……

II. ……

III. ……

IV. ……

V. ……

13. Research assistant will record the test results whether they are

(a) Positive or (b) Negative or (c) Inconclusive

14. Are you ready to receive your test results? (a) Yes (b) No

If 'no' explain why

I. ……

II. ……

III. ……

IV. ……

15. Are you willing to receive daily HIV educational information through SMS?

(a) Yes (b) No

This part will be filled by the research assistant by looking into the patient's documentations in the computer and asking the physician who is treating the patient.

16. Patient tested by the physician (a) Yes (b) No

17. If 'yes' to question 17 explain why?

I. …….

II. …….

III. ……

18. If 'yes' in question 17, test results are (a) Positive (b) Negative

To be filledtwo months afterHospital discharge

19. Did you attend the HIV clinic (a) Yes (b) No

20. If 'yes' to question number 19 explain why

I. ……..

II. ……..

III. …….

IV. …….

21. If no to question number 19 explain why

I. …….

II. …….

III. …….

IV. …….

8.2 Appendix 2: Consent form (English version)

ID NO……..

PERMISSION FOR YOU TO TAKE PART IN RESEARCH

Study title: THE FEASIBILITY AND YIELD OF HIV SCREENING AMONG ADULT TRAUMA PATIENTS ATTENDING EMERGENCY DEPARTMENT AT MUHIMBILI NATIONAL HOSPITAL

Introduction:

You are being asked to take part in this study because I am looking atthe feasibility and yield of HIV screening among adult trauma patients attending Emergency Department at Muhimbili National Hospital. Your decision whether or not to take part will have no effect on thequality of medical care that you will be given.

Please ask questions if there is anything about this study you do not understand.

What is the purpose of this study?

To determine the feasibility and yield of HIV screening among adult trauma patients attending Emergency Department at Muhimbili National Hospital

.

Will you benefit from taking part in this study?

You will be a volunteer and might not personally benefit from being in this research study. However, results from this study are expected to be a baseline for knowing whether it is possible to do a routine HIV tests to all patients attending the hospital acute settings and the outcome of the tests. As such the HIV positive patients can be identified early and get treated early and to avoid the transmission of the infection to their partners. Such information will later be used to improve service provision to all patients attending the hospital acute settings whether they participated in this study or not.

What does this study involve?

Some information about you that have recorded in your treatment chart will be recorded in a special form for the purpose of this study. Your name will not be recorded. You may be asked some questions about you if that kind of information could not be obtained from

your treatment chart. If blood test has been done results will be recorded too. No treatment or any intervention will be done.

What are the options if you do not want to take part in this study?

Your participation in this study is completely voluntary. You will continue to receive regular care regardless of whether you participate in the study not.

What are the risks involved with taking part in this study?

Since no intervention of any kind will be done we anticipate no risks to your health.

•**Leaving the study:** You may choose to stop taking part in this study at any time for any reason. If you decide to stop taking part, it will have no effect on your medical care.

•**New Information:** New information related to this study will be made known to you when it becomes available.

How will your privacy be protected?

Information about you as well as the test results will be kept strictly confidential. The study information will be stored in protected computer files and in paper records stored in locked filing cabinets. Only study staff will have access to the information.

The information will be maintained indefinitely.

Who may use or see your health information?

By signing this form, you allow the research team to use your health information and give it to others involved in the research. The research team includes the principle investigator, supervisor, research assistant and MUHAS staffs that will be involved in reviewing my research report.

Your permission to use your health information for this study will not end until the study is completed. You may ask for your study data at any time.
It is possible for a court or government official to order the release of study data including information about you.

What if you decide not to give permission to use and share your personal health information?

If you do not allow use of your health information for this study, you may not take part in this study.

If you choose to stop taking part in this study, you may cancel permission for the use of your health information. You should let the researcher know if you want to cancel your permission. The study team will assist you in putting your wishes in writing. Information collected for the study before your permission is cancelled will continue to be used in the research.

Whom should you call about this study?

If you have questions about this study or need to report a study related injury, you can call your doctor or the principle investigator for this study: Dr. JumaRamadhani (0712-257075)during normal working hours. If you have questions about your rights as a participant, you may contact, **Dr Bruno Sunguya, Director of Publications and Research**, M**uhimbili University of Health and Allied Sciences, Research and Publication Committee, P. O. Box 65001, Dar es Salaam, Telephone number 2150302-6**

What about the costs of this study?

There will be no costs for you if you agree to participate in the study. All study costs will be supported by the research team and MUHAS.

Will you be paid to take part in this study?

There will be no payment to you for participation in the study.

If you agree that you will take part in this study and you sign this consent form, you are not giving up any of your legal rights.

CONSENT

I have read the above information about THE FEASIBILITY AND YIELD OF HIV SCREENING AMONG ADULT TRAUMA PATIENTS ATTENDING EMERGENCY DEPARTMENT AT MUHIMBILI NATIONAL HOSPITALand have been given time to ask questions. I agree to take part in this study and I have been given a copy of this signed consent form.

SIGNATURE

_____

Researcher or Designee Signature and Date Printed Name

_____

Patient or Legally Authorized Representative and Date Printed Name

8.3 Appendix 3: Consent form (Swahili version)

RIDHAA YA KUSHIRIKI KWENYE UTAFITI HUU

NambayaUtambulisho ……

Study title: THE FEASIBILITY AND YIELD OF HIV SCREENING AMONG ADULT TRAUMA PATIENTS ATTENDING EMERGENCY DEPARTMENT AT MUHIMBILI NATIONAL HOSPITAL

Utangulizi:
Unaombwakushiriki katika utafiti huu kwasababuninafanyauchunguziwauwezekanowakuwapimavirusivinavyosababishaugonjwawaukimwiwagonjwawotewanaopatamatibabu katika idarayadharulaya Hospitali yaTaifaya Muhimbili pamoja na matokeoyavipimohivyo.

Uamuziwakowakushiriki au kutoshirikihautakua na atharizozotekwenyeuborawahudumautakayopewa.

Tafadhaliulizaswalikamakunakituusichokielewakuhusu utafiti huu.

Je dhumuni la utafiti huu nilipi?
Dhumuni la utafiti huu nikuchunguzauwezekanowakuwapimavirusivinavyosababishauginjwawaukimwiwagonjwawotewanaotibiwa katika idarayadharulaya Hospitali yaTaifaya Muhimbili pamoja na matokeoyavipimohivyoiliwawezekugundulikamapema na wawezekupatiwamatibabumapema.

Je utafaidikakwakushirikikwenye utafiti huu?
Inawezekanakuwawewebinafsiusifaidikekwakushirikikwenye utafiti huu. Lakinimatokeoya utafiti huu yanategemewakuwamsingiwakujuauwekezekanowakuwapimavirusivinavyosababishaugonjwawaukimwiwagonjwawotewanaokuja katika idarahiiyadharurailiwawezekugundulikamapema, na kupatamatibabmapema.

Je Utafiti huu unahusishanini?
Taarifazakozilizohifadhiwakwenyefaililako la matibabuzitarekodiwakwenyefomumaalumya utafiti huu.Inawezekaukaulizwamaswalikadhaa pale taarifahizozitakapoonekahazijakamilika.Taarifazabaadhiyavipimovyakozitarekodiwapia.

Je itakuwajekamahutatakakushirikikwenye utafiti huu?
Kushirikikwakokwenye utafiti huu nihiarikabisa. Utaendeleakupatahudumabilakujalikamaumeshirikikwenye utafiti ama la.

Je kunaathariganizakushiriki katika utafiti huu?
Hakunatibaitakayotolewakwalengo la utafiti huu. Kwahiyohakunaathariinayotegemewakutokanana utafiti huu.

Kuondokakwenye utafiti:
Unawezakuamuakusitishakuendeleakushirikikwenye utafiti huu mudawowotenakwasababuyoyote. Kama utaamuakuachakushirikihautaathirihudumazaafyakwako.

Maelezomapya:
Utajulishwamaelezomapyakuhusianana utafiti huu maratuyatakapokuwayamepatikana.

Utunzajiwasiri?
Taarifazakonamajibuyavipimoyatakayorekodiwayatatunzwakwausirimkubwa. Habarizihusuzo utafiti zitatunzwakwenyekompyutazenyeulinzi na rekodi, zilizopokwenyemakaratasizitatunzwakwenyemakabatiyanayofungwa. Ni wafanyakaziwanaohusikana utafiti tundiowatakaowezakuonataarifa, na taarifahizizitatunzwasikuzote.

Ninanianawezakutumia au kuonataarifazakozaafya?
Kwakuwekasahihikwenyefomuhiiumeruhusuwatafitikutumiataarifazaafyayakonakuwapatiawenginewanaohusika na utafiti huu. Watafitinipamoja na mwendesha utafiti pamoja, msaidiziwa utafiti, msimamiziwa utafiti na wenginewanaohusika na utafiti huu ambaowapo chuo kikuu cha sayansi na tiba cha Muhimbili.

Ruhusayakutumiataarifazaafyayakoitaishawakati utafiti utakapokamilika.Unawezakuombataarifazazakowakatiwowote.

Inawezekanamahakama au afisawaserikaliakaamurukuonyeshwakwataarifaza utafiti ikiwanipamoja na taarifazako

Je itatokeaninikamautaamuakutotoaruhusayakutumia na kushirikishawenginetaarifazakozaafya?

Kama hautaruhusutaarifayaafyayakozitumike, hautawezakushirikikwenye utafiti huu. Kama utachaguakuachakushiriki katika utafiti huu, unawezakufutaruhusayamatumiziyataarifazaafyayako.

Watafitiwatakusaidiakuwekamatakwayakokwenyemaandishi.Taarifazitakazokuwazi mekusanywakablayakufutaruhusazitaendeleakutumikakwenye utafiti.

Je utampigiananikuhusu utafiti huu?

Kama unamaswalikuhusu utafiti au ukiwanahajayakuripotiatharizitokanazo na utafiti, unawezakumpigiadaktariwako au mwendesha utafiti huu: **Dr JumaRamadhani (**0712-257075**) mudawamasaayakazi.** Kama unaswalikuhusuhakizakokamamshirikiunawezakuwasilianana**Dr Bruno Sunguya, MkurugenziwaKamatiyaKitengo cha Utafiti, Chuo Kikuu Cha Sayansi na Tiba Cha Muhimbili, S.L.P 65001, Dar es Salaam, Nambaya Simu 2150302-6**

Je kunagharamajuuyatafiti huu?

Hakunagharamakamautakubalikushirikikwenye utafiti huu. Watafitina Chuo kikuu cha Muhimbili watasaidiagharamazoteza utafiti.

Je utalipwakwakushirikikwenye utafiti:

Hapatakuwa na malipokwakokwakushirikikwenye utafiti

Ridhaa

Nimesomamaelezohapojuukuhusuuchunguziwauwezekanowakuwapimavirusivinavyosababishaugonjwawaukimwiwagonjwawotewanaopatamatibabu katika idarayadharulaya Hospitali yaTaifaya Muhimbili pamoja na matokeoyavipimohivyo. nanimepewamudawakuulizamaswali. Nakubalikushiriki katika utafiti huu nanimepewafomuyaridhaahiiiliyowekwasahihi.

Sahihi

Sahihiyamtafiti au kaimunatarehe Jinakamili

Sahihiyamshiriki au mwakilishiwakisheria na tarehe Jinakamili