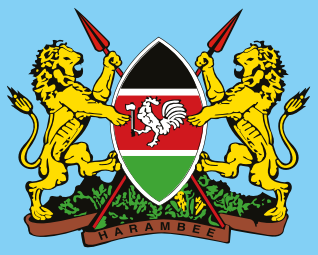

REPUBLIC OF KENYA
Ministry of Health

OCCUPATIONAL EXPOSURE TO BLOOD AND BODY FLUIDS AND HIV POST EXPOSURE PROPHYLAXIS IN HEALTH CARE FACILITIES IN KENYA 2011 – 2014

2016 Report

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Occupational Exposure to Blood and Body Fluids and HIV Post-exposure Prophylaxis in Health Care Facilities in Kenya 2011 – 2014

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Foreword

Post-exposure Prophylaxis (PEP) is a short term antiretroviral treatment to reduce the likelihood of HIV infection after potential exposure, either occupational or through sexual intercourse.

Health workers are the backbone of HIV/AIDS initiatives, and therefore determine the success rates of related interventions. Occupational exposure to blood or other body fluids in health care settings constitutes a small but significant risk of transmission of HIV and other blood-borne pathogens. In addition, such exposures can cause tremendous anxiety, fear and stress among health workers leading to a negative impact not only on the health workers, but also their families and colleagues. These infections acquired through the occupational route are largely preventable through strict infection prevention and control (IPC), universal precautions, use of safe devices, proper waste disposal, immunization against hepatitis B virus, and prompt management of exposures including the use of post-exposure prophylaxis for HIV. Within the health care sector, PEP should be provided as part of a comprehensive universal pre-caution package that reduces health workers' exposure to infectious hazards in the course of duty.

Being at the frontline in responding to the public health needs, there is need for health workers to have optimal access to HIV services including prevention, treatment, care and support at the workplace.

This survey was planned, conducted and analysed by a team of IPC experts, technical advisors, PEP implementing partners, and government officials from the Ministry of Health (MOH). The objective of this survey was to provide comprehensive information on the PEP uptake among the health workers in Kenya.

The report indicates that exposure to HIV and other blood borne pathogens is high, and that access and adherence to PEP including adherence was sub optimal. This provides public health planners, policymakers and researchers with valuable insights into the HIV epidemic in Kenya and allows them to tailor interventions to health workers health facilities, and regions with greatest needs to maximize impact. It also provides data necessary to evaluate the scope and effectiveness of the current PEP programs.

In view of this, the Ministry of Health is determined to reduce to zero, the transmission of HIV and other blood borne pathogens in the health care setting.

It is my pleasure to present this remarkable report which presents the findings of the first evaluation of Occupational Exposures to Blood and Body Fluids and Post-exposure Prophylaxis in Kenya, 2015.

Dr Jackson Kioko
Ag. Director of Medical Services
Republic of Kenya

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The success of this evaluation report on occupational PEP was a concerted effort of various individuals and organisations. The Ministry of Health through NASCOP acknowledges, Centers for Disease Control and Prevention (CDC), mHealth Kenya and individuals whose time, efforts, technical inputs, and expertise enabled finalization of this report.

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Executive Summary

1. Introduction

The health workers (HWs) are at risk of experiencing morbidity and mortality due to exposure to HIV and other blood borne pathogens (BBP) such as Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) among others in the course of duty. Each day, thousands of HWs around the world suffer accidental occupational exposures to BBP during the course of their work. In 2002, the World Health Organization (WHO) reported that about 3 million percutaneous occupational exposures to blood or other bodily fluids occur every year among 35 million health workers. This could have led to an estimated 16,000 HCVs, 66,000 HBVs and 1,000 HIV infections among health workers.

Due to this risk, standard precautions should be put in place to minimize the risk of exposure, and in the event of an exposure, the health worker should be provided with post-exposure prophylaxis (PEP) services. These include, first aid to the exposure site, risk assessment, counselling, provision of the PEP starter pack, laboratory tests, provision of full course of ARVs, follow up and documentation of the process.

The National AIDS and STIs Control Programme (NASCOP) spearheads the Ministry of Health's (MOH) prevention and management of HIV/AIDS in Kenya. NASCOP has been implementing several interventions to eliminate HIV transmission in health care settings in line with the Kenya National AIDS Strategic Plan III (2008-2012), and the Kenya AIDS Strategic Framework (2014-2019). Key functions include; integration of training on occupational PEP into the national HIV training curriculum, development and dissemination of information, education and communication (IEC) materials on PEP as well as PEP registers and tools to document exposures and PEP uptake. NASCOP also advocates for the universal availability of PEP for all occupational exposures across the country, and has worked with partners, to roll out a mobile-phone based exposure /PEP reporting platform called mPEP.

Since inception of the occupational PEP program, no formal evaluation has been carried out to understand occurrence, magnitude, possible causes, and mitigation factors. This evaluation report is an outcome of the first formal assessment of occupational PEP services and the magnitude of exposures in a sample of health facilities in Kenya. This report purposes to describe the nature of occupational exposures to blood and body fluids that occur among health workers and, describe the implementation of the occupational PEP program including the roll-out of mPEP. The recommendations from this evaluation will guide future program interventions and scale up.

2. Methods

This was a cross-sectional study carried out in eighteen counties of Kenya through a multi-stage cluster stratified sampling covering 53 health facilities from level 3 (Health Centres) to level 6 (national teaching and referral hospitals). It was carried out in March 2015 and covered the period from January 2011 to December 2015. The sampled counties were from both low and high HIV burden counties.

Standard electronic and hard copy data collection tools were used to abstract data from PEP registers and/or other documentation available at facility. Facility profile and PEP services data were collected from the facility management or records units. The two primary outcome variables were occupational exposure to blood and body fluids and PEP uptake. The secondary outcome variable was completion of PEP and HIV sero-conversion. Predictors of the outcome included age, sex, cadre of staff, type, severity and risk of exposure, Anti-Retroviral Therapy (ART) regimen, baseline HIV and HBV status of the source, and exposed health workers.

Data were cleaned, merged and descriptive analysis conducted using SAS. Institution Review Board (IRB) approval from Centers for Disease Control and Prevention (CDC) was sought for use of routine program data.

3. Key Results

a. Implementation of the Occupational Post-exposure Prophylaxis System in health facilities in Kenya:

i. The majority, 88.7% (47 out of 53) of health care facilities had a 24 hour occupational PEP service in place.
ii. Only 4 out of the 8 sampled health centres (50%) had 24 hours occupational PEP Service.
iii. The official MOH PEP registers were available in less than 50% of the sampled facilities and some of the registers had no exposures recorded for over the 4 years study period.

b. Factors and Characteristics for Occupational Exposures

i. Among the 1,665 exposed health workers, the peak of exposure was in those aged 21-25 years with 617 (37.1%) exposures.
ii. Students contributed to the largest proportion of exposures 282 (33.1%), followed by doctors (225, 26.5%).
iii. Needle stick injuries were the highest 652 (76.6%) cause of exposure.
iv. Most exposures occurred in medical wards with 210 (24.7%) exposures, surgical wards 148 (17.4%), theatre 97 (11.4%) and maternity wards 95 (11.2%).
v. 806 of the 851 (94.7%) exposures documented in the PEP registers were considered medium to high risk.

c. Extent of Post-exposure Prophylaxis Uptake:
   i. There was weak institutional support in coordinating availability and accessibility to PEP within two hours of exposure.
   ii. There was lack of adherence to the standard recommended PEP regimens.
   iii. There was inadequate documentation of PEP uptake.

d. Hepatitis B (HBV) Status of Source Patients and Exposed Health workers:
   i. Only 41 (5%) source patients were tested for HBV and of these, 15 (36.6%) were HBV positive.
   ii. Only 172 (20.21%) of the 851 health workers who documented HBV status were vaccinated against HBV.

e. Implementation of mPEP System:
   i. Of the 53 sampled facilities, 22 were enrolled into the mPEP system of which 18 (82%) had submitted a report through the system.
   ii. Only 74 of the 1,665 (4.4%) exposures were reported through the mPEP system

4. Conclusions and Recommendations

a. County health teams should be supported to integrate supervision of occupational PEP services into their routine supervision.

b. Counties should be supported to train and mentor health workers at the health care facilities on occupational PEP.

c. The MOH should harmonize the information in the existing registers and develop a revised occupational PEP register for use in all health facilities and work with counties to ensure that all others are phased out.

d. Due to the high exposures among students and younger less experienced health workers;
   i. There is need for an orientation and refresher training to all students and incoming staff on standard precautions and safety.
   ii. A review of the preservice training curriculum to include infection prevention control including occupational PEP management prior to attachment in clinical areas.
   iii. Close supervision to ensure adherence to safety protocols.

e. Health workers in clinical areas had higher rates of exposures. Program reports indicate these cadres of staff usually miss out on the safety trainings. We thus recommend having continuing medical education (CME) sessions on injection safety, infection prevention and control (IPC) and biosafety that specifically target these cadres.

f. Needle sticks caused a majority of the sharps injuries during therapeutic injections and blood collections. We thus recommend:
   i. Use of safety-engineered devices.
   ii. Training on injection safety and safe phlebotomy.

g. The in-patient departments including the medical and surgical wards, maternity units, and operation theatres had the majority of exposures. We recommend:
   i. Having department-specific point of contact for IPC and safety issues to follow-up.
   ii. Develop departmental specific interventions to improve safety like refresher trainings, job aids on occupational safety, IEC materials, on-job training and mentorship.

h. Due to the low documentation of the PEP regimen administered, PEP completion and HIV and HBV status of the source patient and the exposed health worker, we recom mend training of the health workers on the importance of quality data management.

i. Due to the delay in administering PEP within the first two hours of occupational exposure, we recommend:
   i. Storing and monitoring of PEP drugs be at an accessible point for 24 hours to shorten the time from exposure to initiation within an institution.
   ii. To have in place a telephone or in-person consultation with an experienced HIV provider or occupational health clinician experienced in providing PEP. This will make it possible to administer the PEP at any given time including at night.

j. Weak follow up system after occupational exposure and PEP uptake made it difficult to understand the outcomes and monitor adherence. We thus recommend to:
   i. Improve institutional structures in the coordination and management of PEP services.
   ii. Provide PEP standard operating procedures to all health institutions.

k. All health workers including students and interns should be vaccinated for HBV.

l. After accidental exposure, the baseline HIV, HBV and HVC status of both the source where possible, and the health worker should be documented.

m. There is need to further explore technical and other challenges that led to the low utilization of mPEP and address these before further scale-up.

Abbreviations

3TC	Lamivudine
D4T	Stavudine
ARV	Antiretroviral drug
ART	Antiretroviral Therapy
AZT	Zidovudine
BBP	Blood Borne Pathogens
CCC	Comprehensive Care Centre
CDC	Centers for Disease Control and Prevention
CHMT	County Health Management Teams
CME	Continuing Medical Education
GOK	Government of Kenya
DHMT	District Health Management Team
HIV	Human Immunodeficiency Virus
HSV-2	Herpes Simplex Virus-2
HBV	Hepatitis B Virus
HC	Health Centre
HCF	Health Care Facility
HCV	Hepatitis C Virus
HWs	Health Workers
HPV	Human Papilloma Virus
HTC	HIV Testing and Counselling
ILO	International Labour Organization
IM	Intramuscular Injection
IPC	Infection Prevention and Control
IRB	Institutional Review Board
IV	Intravenous Injection
JSI	John Snow Incorporated
KAIS	Kenya AIDS Indicator Survey
KASF	Kenya AIDS Strategic Framework
KP	Key Populations
LPV/r	Lopinavir with Ritonavir

mHealth	Mobile Health
MMS	Making Medical Injections Safer
MOH	Ministry of Health
mPEP	Mobile Post-exposure Prophylaxis Platform
NASCOP	National AIDS/STI Control Programme
OPD	Out-Patient Department
PEP	Post-Exposure Prophylaxis
PLHIV	People Living With HIV/AIDS
PMTCT	Prevention of Mother-To-Child Transmission
SC	Subcutaneous
SAS	Statistical Analysis Software
SOP	Standard Operating Procedure
TB	Tuberculosis
TDF	Tenofovir
UNAIDS	United Nations Joint Programme on HIV/AIDS
VCT	Voluntary counselling and testing
WHO	World Health Organization

1. INTRODUCTION

1.1 Background

Recruitment and retention of qualified staff remains a key challenge in maintaining health systems[1]. The International Labour Organisation / World Health Organisation (ILO/WHO) joint guidelines on health services and HIV/AIDS 2005[2] define health workers (HWs) as "all people engaged in actions whose primary intent is to enhance health[3]." These include doctors, nurses, pharmacists, laboratory technicians, and management support workers such as finance officers, cooks, drivers, cleaners and security guards. The growing dual epidemic of HIV and TB increases the demand for health services and consequently the workload of HWs in areas with a high HIV and TB burden.

Health workers are at risk of experiencing morbidity and mortality due to exposure to HIV and other blood borne pathogens (BBP) such as Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) among others in the course of duty[4]. Despite being at the frontline responding to the public health needs, health workers often do not have optimal access to HIV services. Health workers should be covered against the high risk of HIV and other BBP due to occupational exposure, and have access and benefit from prevention, treatment, care and support services at the workplace.

Each day, thousands of health workers around the world suffer accidental occupational exposures to BBP in the course of their work. In 2002, the World Health Organisation (WHO) reported that, annually, about 3 million percutaneous occupational exposures to blood or other bodily fluids occur in hospital setting among the 35 million health workers.[5] This could have led to an estimated 16,000 HCVs, 66,000 HBVs and 1,000 HIV infections among HWs. The average risk of HIV acquisition after percutaneous exposure to infected blood is estimated to be 0.3% and about 0.09% after exposure to mucous membrane[6]. The risk of acquiring blood borne infections is high in Africa, most probably reflecting the high prevalence of those BBPs in the African setting[7].

1Recommendation concerning HIV and AIDS and the world of work, 2010 (No. 200)
International Labour Office, Geneva, 2010

2World Health Organisation.The world health report 2006: working together for health.

3ILO/WHO Joint guidelines on health services and HIV/AIDS, 2005

4Taegtmeyer M, Suckling R, Nguku P, Meredith C, Kibaru J, Chakaya J et al; Working with risk Occupational Safety issues among health workers in Kenya Aids Care 2008

5Pruss Ustur A, Rapiti E, Hutin Y Sharps injuries: Global burden of disease from sharp injuries to health workers, WHO 2003

6Gupta A,Anand S, Sastry J, Krisagar, A, Basavaraj A,Bhat SM, etal.High risk for occupational exposure to HIV and utilization of post exposure prophylaxis in a teaching hospital in Pune, India.BMC Infect Dis. 2008 Oct 21-8(1):142(PMC Free article) (Pub Med)

7Sagoe- Moses C, Pearson RD, Perry J, Jagger J Risks of health care worker in developing countries. N Engl J Med.2001 August 16:345(7):538-41 11519511

Subsequently, every workplace should have primary prevention of occupational exposure to BBPs and promote immunization of HWs against HBV and other vaccine preventable diseases. Standard precautions should also be put in place to minimize the risk of exposure and in the event that an exposure occurs, the HW should be provided with PEP Services. These include, first aid to the exposure site, risk assessment, counselling, provision of the PEP starter pack, laboratory tests, provision of full course of ARVs, follow up, and documentation of the process.

The health sector is responsible for the prevention, diagnosis, care, and treatment of illness and can contribute to reducing stigma and discrimination in the context of health services. The ILO calls for countries to protect the health and rights of their HWs by optimizing their working conditions. By protecting health workers, countries would ensure that those providing health services are themselves healthy. This will in turn facilitate people's rights of access to quality health services. The Constitution of Kenya 2010 calls for the rights for all Kenyans to access equitable, affordable and quality health and related services at the highest attainable standards.

The National AIDS and STIs Control Programme (NASCOP) spearheads the Ministry of Health's prevention and management of HIV/AIDS in Kenya. The program has several units including treatment, prevention, key populations (KP), prevention of mother-to-child transmission (PMTCT) among others. There has been a rapid scale up to enrol People Living with HIV (PLHIV) on care and treatment with 2015 program estimates of over 950,000 on care and over 850,000 on treatment[8]. This increased access to health services has seen the possibility of achieving epidemic control and reaching the 90:90:90 as envisioned by the United Nations Joint Programme on HIV/AIDS (UNAIDS) fast-track document[9], and supported by the Kenya AIDS Strategic Framework (KASF) . However, this has also meant that there are more PLHIV seeking care at the health facilities thus increasing the accidental exposure risks of health workers.

Injection safety is one of NASCOPs' programs whose mission is to support development of policies, guidelines, technical assistance and coordination of MOH and partners in prevention of HIV in healthcare setting. The Kenya National AIDS Strategic Plan III (2008-2012)[11] had one of the objectives as elimination of HIV transmission in health care settings. Several interventions have been implemented since then to address issues of injection safety, health care waste management, and blood safety, all of which can lead to HIV and other BBP transmission.

8NASCOP Program data, 2015

9Joint United Nations Programme on HIV/AIDS, and Joint United Nations Programme on HIV/Aids. "90-90-90: an ambitious treatment target to help end the AIDS epidemic." Geneva: UNAIDS (2014).

10National AIDS Control Council. Kenya AIDS Strategic Framework (KASF) (2014/2015–2018/2019). Nairobi, Kenya, 2014.

11National AIDS Control Council. Kenya National AIDS Strategic Plan 2009–2013 (KNASP III). Nairobi, Kenya, 2009.

NASCOP supported the training on occupational PEP as part of the national HIV training curriculum and ensured universal availability of the same to all exposed health workers. It developed occupational PEP job aids, PEP registers, and disseminated them to hospitals and District/County Health Management Teams (D/CHMTs). The health management teams were to further disseminate the documents to all facilities within their jurisdiction up to the lowest level facility (dispensary). In addition to availing the documents and PEP protocols, NASCOP advocated for the universal availability of the PEP starter pack and Anti-Retroviral Drugs (ARVs) at all health facilities offering a minimum of PMTCT package. Due to scale up of the program, it is expected that almost all health facilities are providing PEP services.

To address issues of safety in blood drawing, a pre-service and in-service training program in safe phlebotomy is in place and by mid-2015, over 7,500 health workers had been trained. A sharps surveillance system has been established in 6 hospitals to monitor occupational exposures and uptake of PEP. In 2012, CDC foundation developed mobile telephony application software (m-PEP) to support the reporting of occupational exposures and to create a virtual database of the injuries. The system was expected to enhance reporting of exposures and send reminders to HWs who are taking PEP. In Kenya, the national magnitude of occupational exposures to HIV is unknown due to under-reporting. However, limited published data indicates a high incidence of needle stick injuries in Kenya at 23%-30% annually.[12]

Since the inception of the program, no formal evaluation has been carried out to understand occurrence, magnitude, possible causes and mitigation factors. This evaluation report is an assessment of occupational PEP services and the magnitude of exposures in a sample of health facilities in Kenya.

The magnitude of exposures and management of the PEP was assessed for the period 2011-2014. The purpose of this report is to describe the nature of occupational exposures to blood and body fluids that occur among HWs. Information on the types, frequency, and circumstances of exposure among HWs was used to describe or detect problems, determine ways to prevent exposures, assess priorities for prevention, and measure the impact of prevention programs. Additionally, this report describes the implementation of the occupational PEP program in Kenya. The recommendations from this evaluation will guide future program interventions and scale up.

12D Kimani; “Sharps injuries in Kenya-a review”; Occupational health and safety conference, Naivasha, Kenya, July 2013

1.2 Objectives

The objectives of this evaluation were:

1) To evaluate the implementation of the national needle stick injury and other occupational exposures surveillance system and PEP uptake;

2) To document the magnitude of accidental exposures to blood and body fluids in different tiers of facilities;

3) To determine the characteristics and factors associated with occupational exposures;

4) To establish the levels of complete Hepatitis B vaccination among exposed health workers;

5) To determine completion rates for PEP and subsequent follow-up laboratory test; and,

6) To evaluate the impact of the mobile reporting platform (mPEP) on reporting rates and PEP uptake.

2. METHODS

2.1 Study design

A cross-sectional study was carried out in eighteen counties of Kenya. Two-stage stratified sampling was used. In the first stage, 18 counties were randomly selected from the 47 stratified by high, medium and low HIV incidence counties. In the second stage, 53 facilities were sampled from within the selected 18 counties to represent different levels of health facilities from level 3 (Health Centres) to level 6 (national teaching and referral hospitals). This included 50 Ministry of Health and 3 faith-based facilities. Seven teams of two each were trained, and carried out the study.

2.2 Subjects

The study was carried out in a period of two weeks in March 2015. All the selected facilities offering HIV services were included in the study. Facilities that did not have any PEP information were excluded. A short interview was conducted with the facility in-charge.

2.3 Measurements

Electronic and hard copy standard data collection tools were used to abstract data from PEP registers and/or other documentation available at facility. Facility profile and PEP services data were collected from the facility management or records unit using a facility profile chart (Appendix 1). In addition, data were collected from the PEP registers for all documented exposures between 2011 and 2014 using the data abstraction tool (Appendix 2). The two primary outcome variables were occupational exposure to blood and body fluids, and PEP uptake. The secondary outcome variable was completion of PEP and HIV sero-conversion. Predictors of the outcome included age, sex, and cadre of staff, type, severity and risk of exposure, Anti-Retroviral Therapy (ART) regimen, baseline HIV and HBV status of the source and exposed HW. Information on facility PEP mapping, availability of an infection prevention and control (IPC) committee, health care waste management and participation in the mPEP system were also assessed.

2.4 Analysis

Data were collected using electronic platforms (Samsung Tablet) and transmitted through wireless network to the database in NASCOP. Data was cleaned and merged before analysis was conducted using SAS. Descriptive analysis and frequency tables were used for the various variables. Descriptive analysis was conducted on all the variables of interest.

2.5 Ethical considerations

A protocol to use routine program data was approved by CDC IRB. The data collection teams went through basic ethical training and signed intent to maintain confidentiality forms binding them to keep any clients', patients', health workers' and other information from health records confidential. A participant's informed consent form was read to the facility management who gave approval on behalf of the facility.

3. IMPLEMENTATION OF THE OCCUPATIONAL POST-EXPOSURE PROPHYLAXIS SYSTEM HEALTH CARE FACILITIES IN KENYA

Key findings:

1. The majority, 88.7% (47 out of 53) of health care facilities had a 24 hour occupational PEP service in place.

2. Only 4 out of the 8 health centres had 24 hours occupational PEP Service.

3. The official MOH PEP registers were available in less than 50% of the sampled facilities and some of the registers had no exposures recorded for over the 4 years study period.

3.1 Introduction

This chapter describes the implementation of occupational PEP services from the 53 sampled health facilities. Information in this chapter includes; facility levels, staffing, accessibility to PEP services within 24 hours, location of PEP drugs, availability and use of occupational PEP registers and the trends of exposures from 2011 to 2014.

3.2 Distribution of health workers by facility levels

The study included 53 facilities from 18 counties. They were distributed as follows: 8 health centres (Level 3), 36 sub county hospitals (Level 4), 7 county hospitals (Level 5) and 2 national teaching and referral hospitals (Level 6). Two facilities were faith based at Level 3 and 4 respectively.

TABLE 3.1: STAFFING LEVELS IN SAMPLED FACILITIES

Cadre	HC	Sub-County Hospital	County Hospital	National Referral Hospital	Total per Cadre	% per Cadre
Doctors	0	286	284	400	970	**6**
Clinical officers	14	392	303	100	809	**5**
Nurses	49	1815	1987	2897	6748	**40**
Laboratory technologists	13	215	152	450	830	**5**
Students	59	1452	1250	1250	4011	**24**
VCT counsellors	8	87	152	118	365	**2**
Cleaners	21	615	434	1730	2800	**16**
Waste handlers	9	270	81	83	443	**2**
Total per levels	173	5132	4643	7028	16976	**100**
% per facility levels	**1**	**30**	**27**	**41**	**100**	
Average per levels	22	143	663	3514	4341	

The number of health workers including the average per levels of health care in the 53 sites is shown in the table 3.1 above. The national hospitals had most staff (7,028; 41%) followed by sub-county hospitals (5,132; 30%), county hospitals (4,643; 27% and health centres (173; 1%). The nurses were the majority at 40%, followed by students at 24%, and the cleaners at 17%. All the other cadres were below 10% with doctors at 5.7%, laboratory technologists at 4.9% and clinical officers at 4.8%. This trend is similar in all facility levels. There were no doctors at health centres level.

FIGURE 3.1: NUMBER OF HEALTH WORKERS BY CADRE

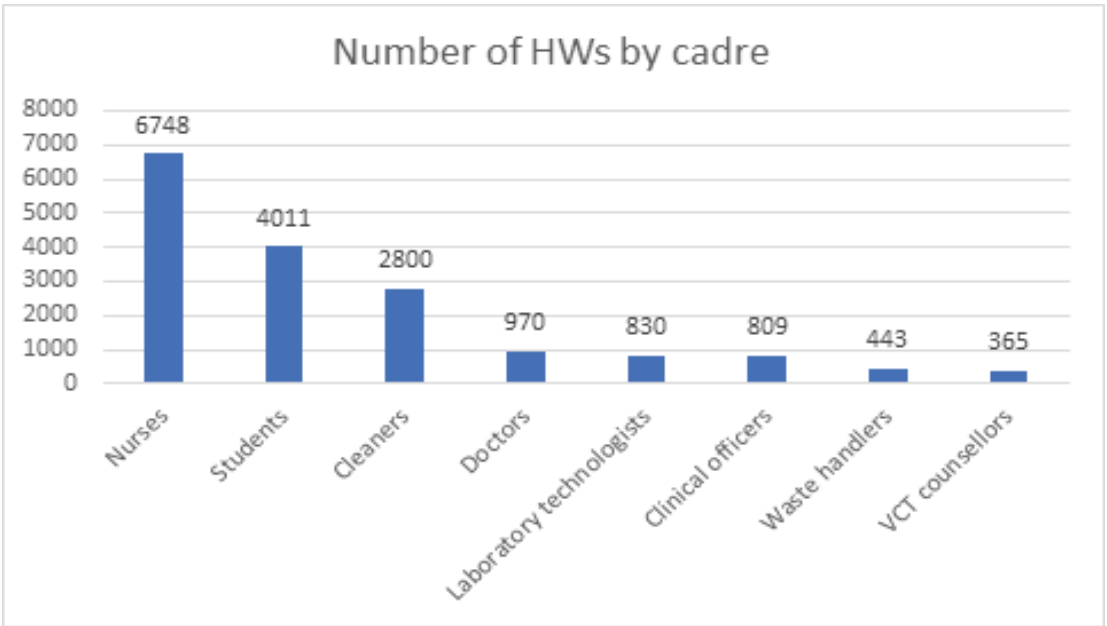
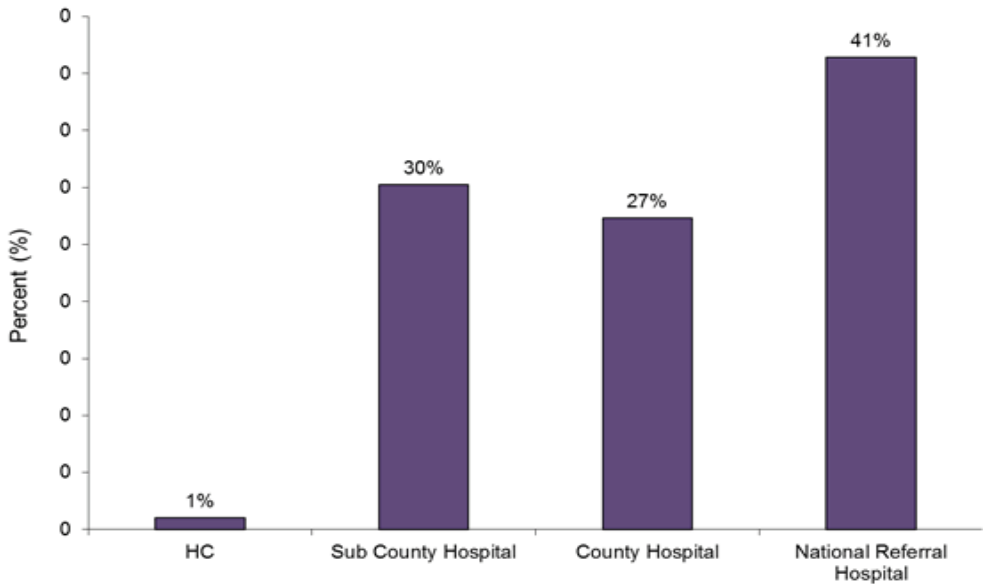


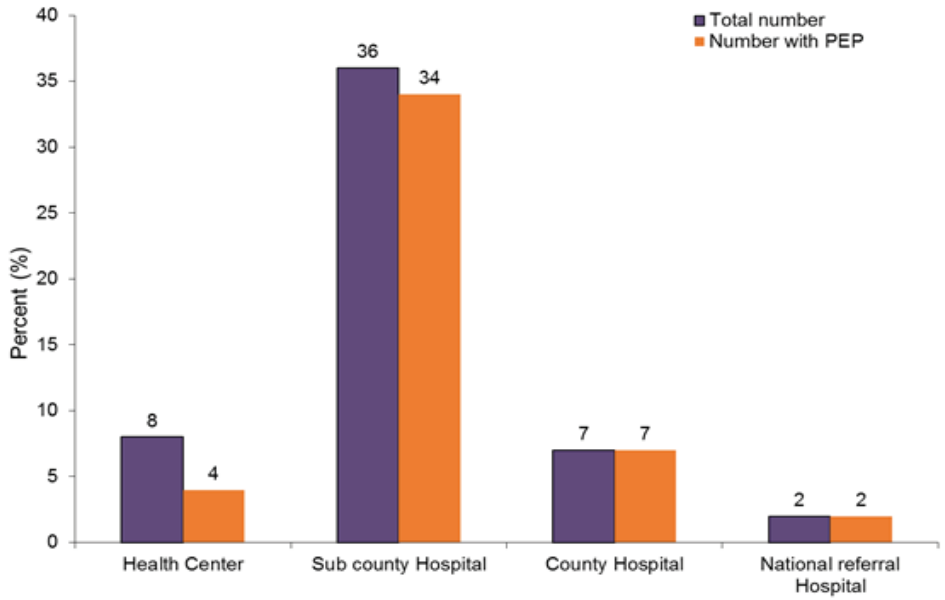
FIGURE 3.2: PERCENTAGE DISTRIBUTION OF HEALTH WORKERS BY FACILITY TYPE



3.3 Provision of PEP services

As shown in Figure 3.3, 47(88.7%) out of the 53 health care facility, had a 24 hour PEP service in place. The access to PEP service at HCs was lowest at 50% followed by the sub-county hospitals at 94%. All the county and national HCFs had access to a 24 hour PEP service. It should be noted that although 47 HCF reported having 24-hour PEP services, only 35 had records of any exposures during the four year evaluation period.

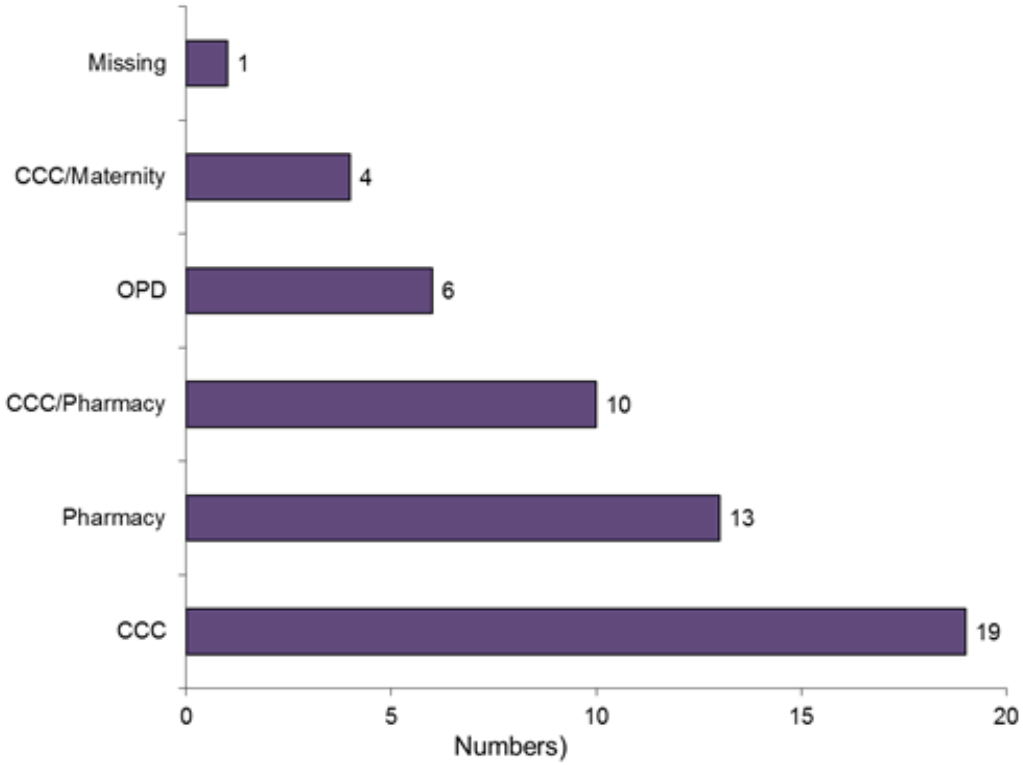
FIGURE 3.3: NO. OF HEALTH FACILITIES WITH 24 PEP SERVICE



3.4 Location of occupational PEP services in health care facilities

This evaluation found that PEP was offered in different locations at different health facilities. In some instances, PEP was offered in more than one location. Figure 3.4 shows that most facilities (19) offered PEP service at the comprehensive care centre (CCC). Ten facilities had PEP services in both CCC and pharmacy while 4 had both at CCC and maternity.

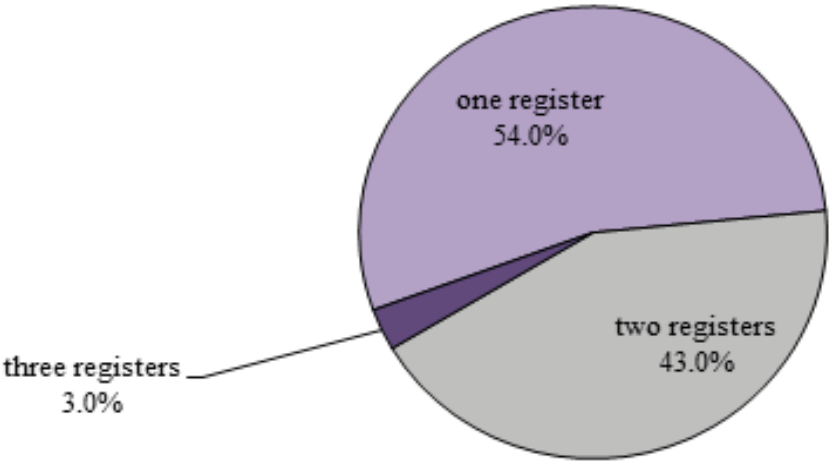
FIGURE 3.4: LOCATION WHERE PEP IS PROVIDED



3.5 Availability of registers

The following four types of PEP registers were found in the sampled facilities: i) Improvised counter books (referred in the document as the black book), ii) Post- exposure Prophylaxis Register for Health Worker, 2010 edition iii) Post-exposure Prophylaxis Register for Health Worker, 2012 edition, and iv) Pilot PEP Register for sharp surveillance. The 3 official registers (ii-iv) are also referred to as MOH PEP registers in this document. Figure 3.5 shows the availability of registers in the facilities reporting exposures in the PEP study. The most frequently available register was the black book in 21 (60%) of the 35 facilities reporting any exposures. The 2010 edition, 2012 edition, and pilot registers were available in 16 (46%), 11(31%) and 4 (11%) of the facilities respectively. It should be noted that most facilities had more than one register at the same time as shown in Fig 3.5. Majority of the facilities were using only one register 19(54%) and quite a number used two registers, 15 (43%). Only 1 (3%) facility was using three registers simultaneously.

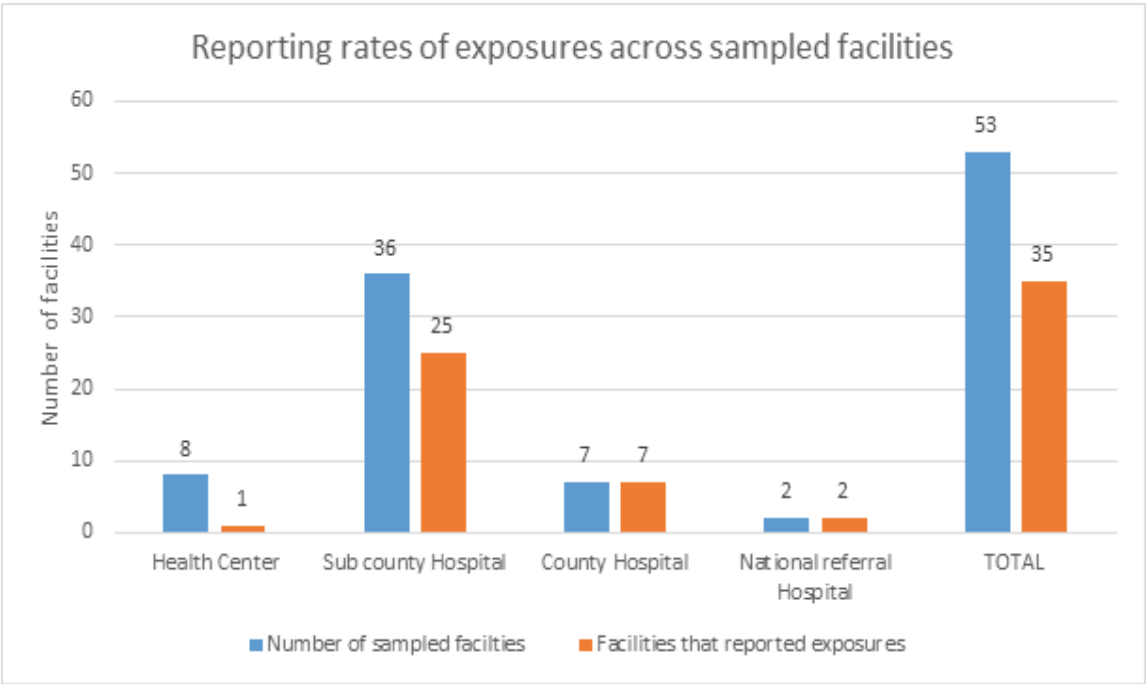
FIGURE 3. 5: NUMBER OF REGISTERS PER FACILITY



3.6: Documentation of occupational PEP services

Of the 53 sampled facilities only 35 (66%) reported any exposures during the 4 year period. Only 1 out of the 8 (12.5%) health centres reported any data and 25 of the 36 (69%) sub-county hospitals. All the county hospitals and national teaching and referral hospitals reported exposures (Fig 3.7).

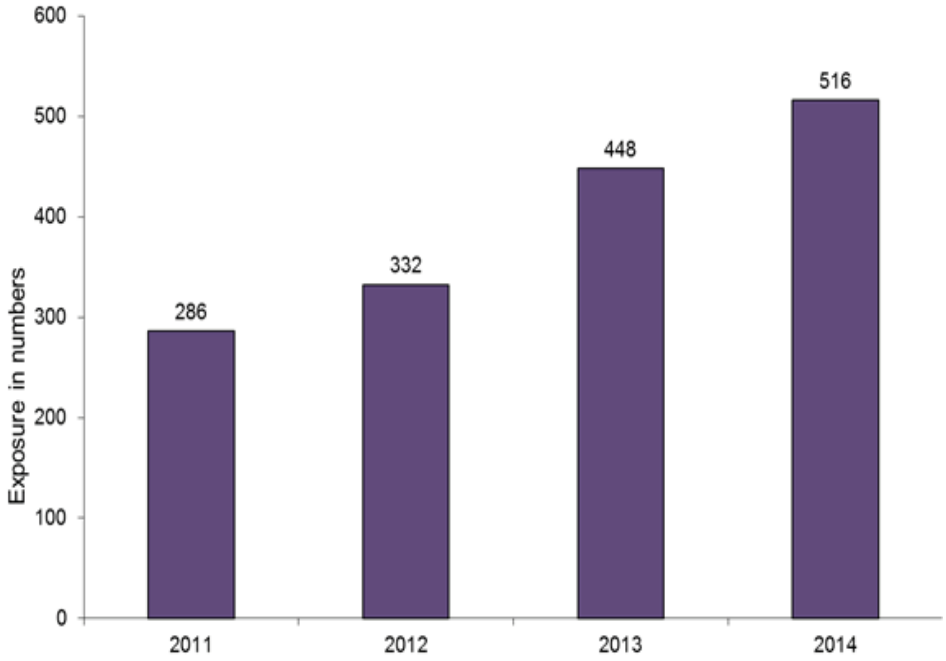
FIGURE 3.6: NUMBER OF HWs WITH REPORTED EXPOSURES (2011-2014)



3.7: Trends of reported occupational exposures from 2011 to 2014

Figure 3.8 shows the trend of reported occupational exposures from 2011-2014. A total of 1665 cases were reported from 2011-2014. There was a gradual increase in reporting over time.

FIGURE 3.7: TREND OF REPORTED EXPOSURES OVER THE LAST FOUR YEARS



3.8 Discussion

All health workers in Kenya should have access to occupational PEP services. In this regard, NASCOP with support from CDC and mHealth Kenya has been supporting counties to establish PEP services in health care facilities. The evaluation findings show that most facilities offered 24 hour PEP services with fewer having occupational PEP reporting tools and recording exposures. Although much effort was made to train levels 4, 5 and 6 health care facilities, the health workers at HCs and dispensary levels had not been trained. The few HCs offering occupational PEP are likely to be those with staff trained on ARV management. Of concern was the realisation that, 2 sub-county hospitals were not offering the services even after training. This could be caused by turnover of trained staff or lack of transfer of knowledge.

The MOH had disseminated the 2010 and later the 2012 PEP registers to all the levels 4, 5, 6 health care facilities. More registers were sent to the then district health teams to distribute to the health centres and dispensaries. This evaluation showed that out of the 35 facilities that reported exposures only 25 facilities had official MOH PEP registers, and 20 of these were using them concurrently with the black book. Only 5 facilities used the

official register exclusively while 10 were using the Black book only. This is of concern since the black book did not record most of the key information and it varied from facility to facility. The concurrent use of the two documents could be as a result of lack of training to some HWs, or lack of accessibility to the official document, lack of supervision of PEP services, and the ease of use of the black book.

The low uptake of the PEP registers can be attributed to lack of follow-up of the facilities by the sub-county teams. As mentioned earlier, the hospital teams in higher level facilities had been trained and provided with Standard Operating Procedures (SOP) on how to set up PEP services. Based on the SOPs, most PEP services were expected to be provided at the CCC. However, a large number of exposed staff was seen in the pharmacy where ARVs are dispensed. This of is concern since the pharmacy does not offer follow-up management and testing.

Reporting for injuries have increased over time with the training of staff and provision of MOH PEP registers. However, it is not possible to determine whether the facilities that did not report exposures over the 4 years had no exposures.

Recommendation

1. County health teams should be supported to integrate supervision of occupational PEP services into their routine supervision.

2. Counties should be supported to train and mentor health workers at the HCFs on occupational PEP.

3. The MOH should harmonize the information in the existing registers and develop a revised occupational PEP register for use in all health facilities, and work with counties to ensure that all others are phased out.

4. FACTORS AND CHARACTERISTICS FOR OCCUPATIONAL EXPOSURES

Key findings:

1. Among the 1,665 exposed health workers, the peak of exposure was in those aged 21-25 years with 617 (37.1%) exposures.

2. Students contributed to the largest proportion of exposures 282(33.1%), followed by doctors 225 (26.5%).

3. Needle stick injuries were the highest 652(76.6%) cause of exposure.

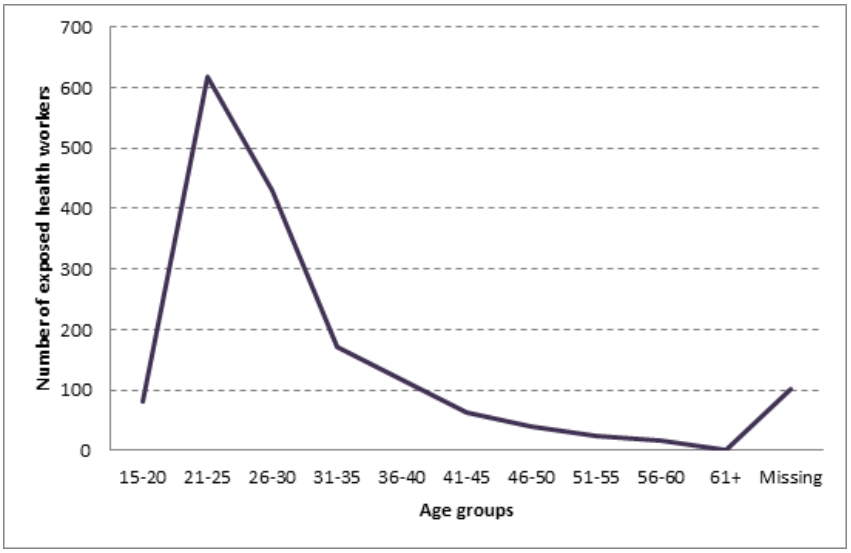
4.1 Introduction

This chapter describes the various factors and characteristics that were associated with needle stick injuries and accidental exposures to blood and body fluids. Since such exposures are common, they pose serious hazards to health workers and so understanding the associated risk factors become critical. The chapter describes the nature, type, frequency and circumstances of exposure among health workers. It reviews the socio-demographic characteristics of the exposed health workers, the location where the exposures occurred, the type of exposure, the procedure and device that was used and the risk associated with the exposure. A total of 1,665 exposures were reported from all tools - both MOH registers and black books. Some characteristics analysed in this chapter will use denominator drawn from total exposures (1,665) from all tools, while others will use denominator (851) drawn from exposures in the MOH registers (Post-exposure Prophylaxis for Healthcare Worker, 2010 and 2012 editions, and pilot register for sharp surveillance) and device related characteristics will be from MOH pilot register for sharp surveillance (304).

4.2 Socio-demographic characteristics of the exposed health workers

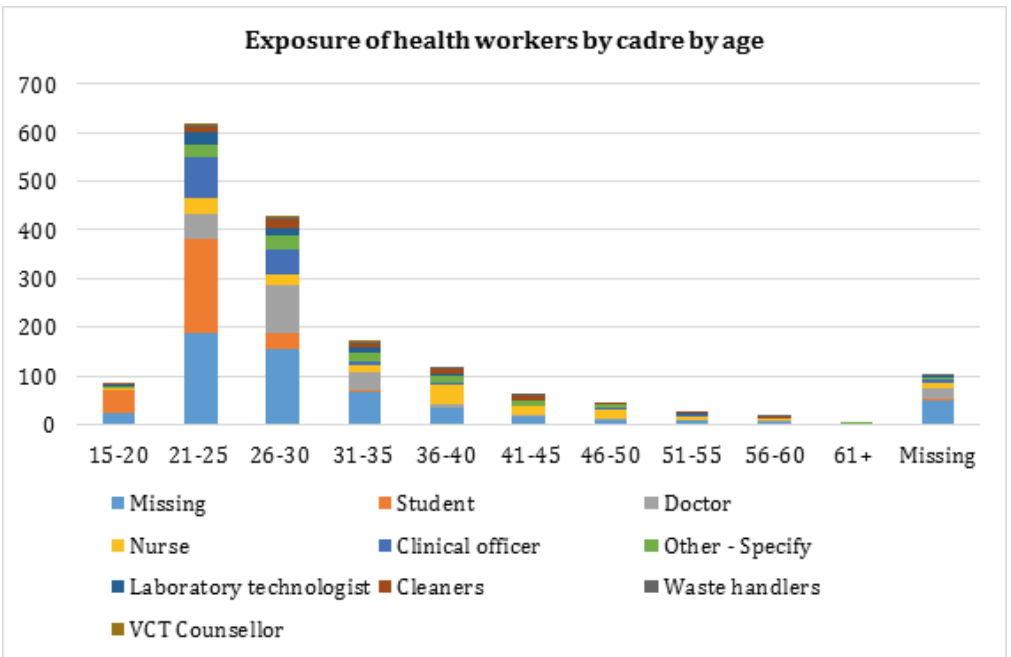
4.2.1 Age distribution of exposed health workers

FIGURE 4.1: AGE DISTRIBUTION OF EXPOSED HEALTH WORKERS



Among the 1,665 exposed health workers, the peak of exposure was in those aged 21-25 years with 617(37.1%) exposures (see Figure 4.1). Ages 26-30 years followed at 430(25.8%), then 31-35 years at 171(10.3%). The least was among those aged over 60 years who were only 2(0.1%). There was a gradual decline in the number of exposures after the age of 35 years.

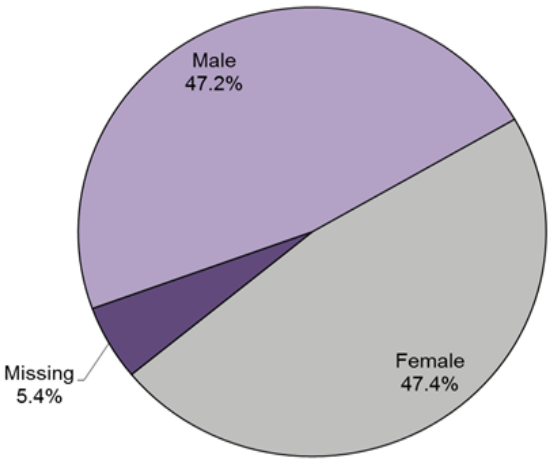
FIGURE 4.2: AGE DISTRIBUTION OF EXPOSED HWS BY CADRE



4.2.2 Sex distribution of exposed HWs

Of the exposed health workers 789(47.4%) were females and 786(47.2%) were males. 90(5.4%) had missing information. The exposures are relatively the same for both sexes (Fig 4.3).

FIGURE 4. 3: EXPOSURES BY SEX



4.2.3 Cadre distribution of exposed HWs

Out of the 1,665 reported exposures in the reporting period, cadre was documented in 1,111(66.7%). Among these, students, doctors, and nurses had the highest number of exposures at 282, 225, and 181 exposures respectively. Cleaners, waste handlers and VCT counsellors had the lowest number of exposures at 60, 17 and 11 respectively (Fig 4.4).

FIGURE 4.4: EXPOSURE OF HWs BY CADRE

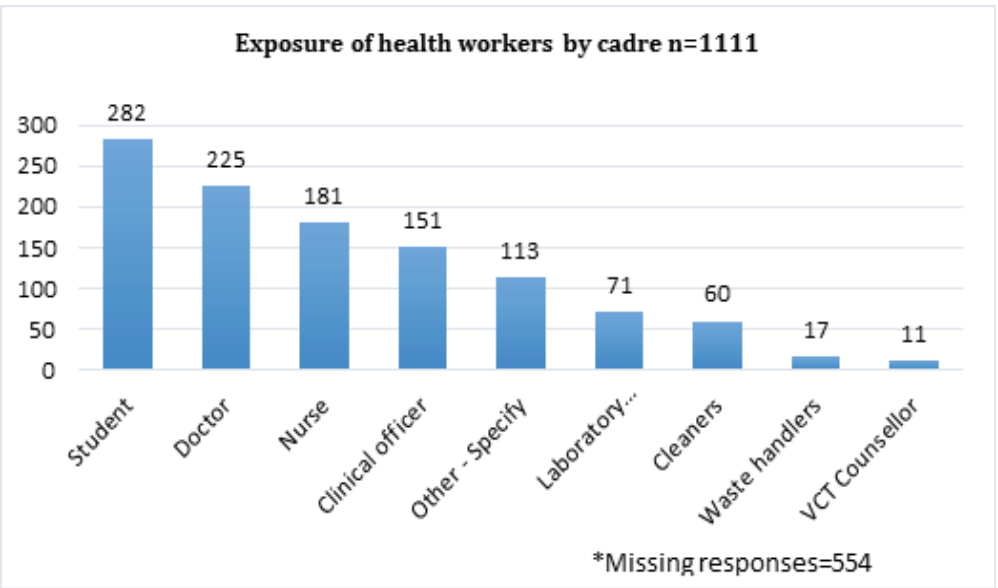
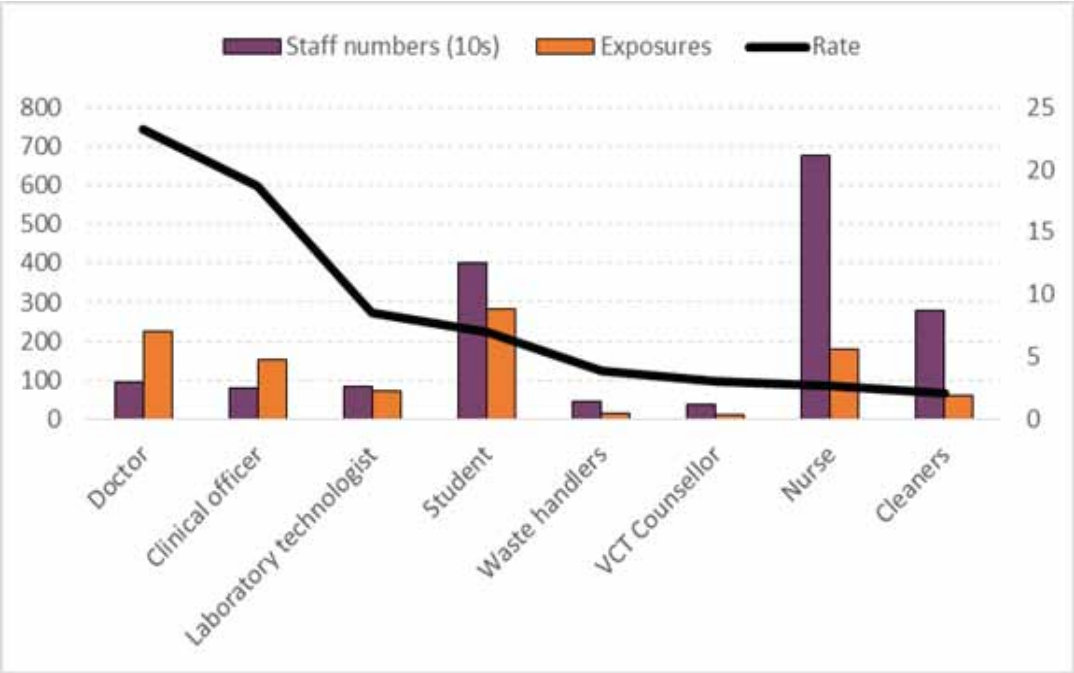


TABLE 4.1: NUMBER AND RATE OF EXPOSURE AMONG THE MEDICAL CADRE

Cadre	Staff Numbers (10s)	Exposures	% Rate
Doctor	97	225	23.2
Clinical officer	80.9	151	18.7
Laboratory technologist	83	71	8.6
Student	401.1	282	7.0
Waste handlers	44.3	17	3.8
VCT Counsellor	36.5	11	3.0
Nurse	674.8	181	2.7
Cleaners	280	60	2.1

FIGURE 4.5: NUMBERS AND RATE OF EXPOSURE AMONG THE MEDICAL CADRE

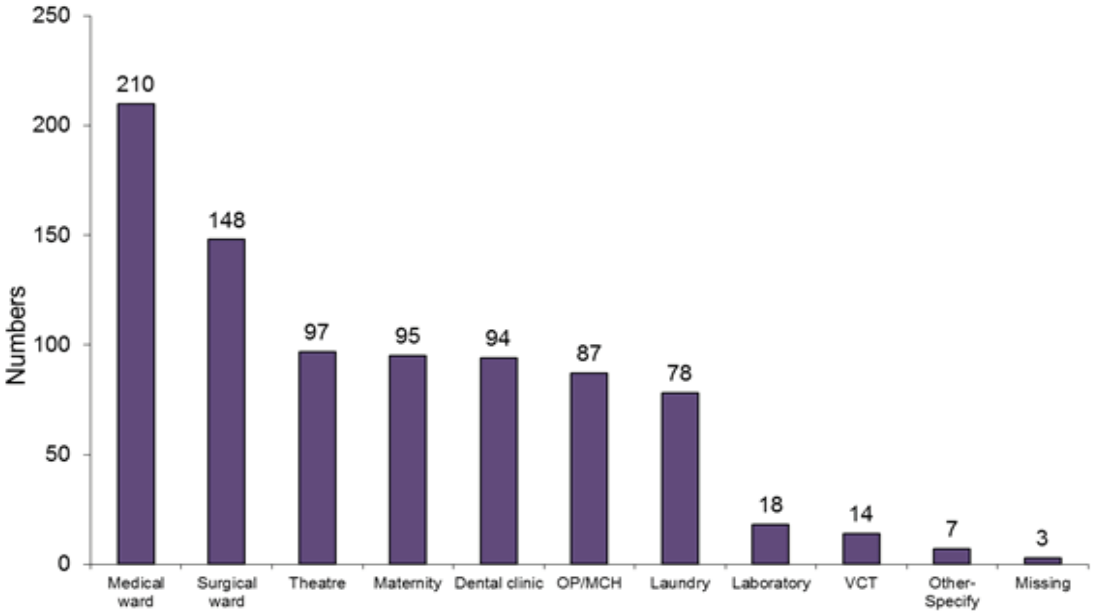


Doctors, clinical officers, and laboratory technologists had the highest rates of exposure at 23.2%, 18.7% and 8.6% respectively. These are the cadres that are involved in most procedures that expose them to risk. The rate of exposure was lowest among the VCT counsellors, cleaners and nurses at 3.0%, 2.7% and 2.1 % respectively.

4.3 Location of HWs during the exposures

Of the 1,665 exposures reviewed, only 851 had the location of exposure documented. As shown in Figure 4.6 most exposures occurred in medical wards 210(24.7%), surgical wards 148(17.4%) and theatre 97(11.4%). The minimal number of exposures were reported in laundry 78(9.1%), laboratory 18(2.1%) and VCT unit at 14 exposures (1.6%).

FIGURE 4.6: DISTRIBUTION LOCATION OF HWs DURING EXPOSURE



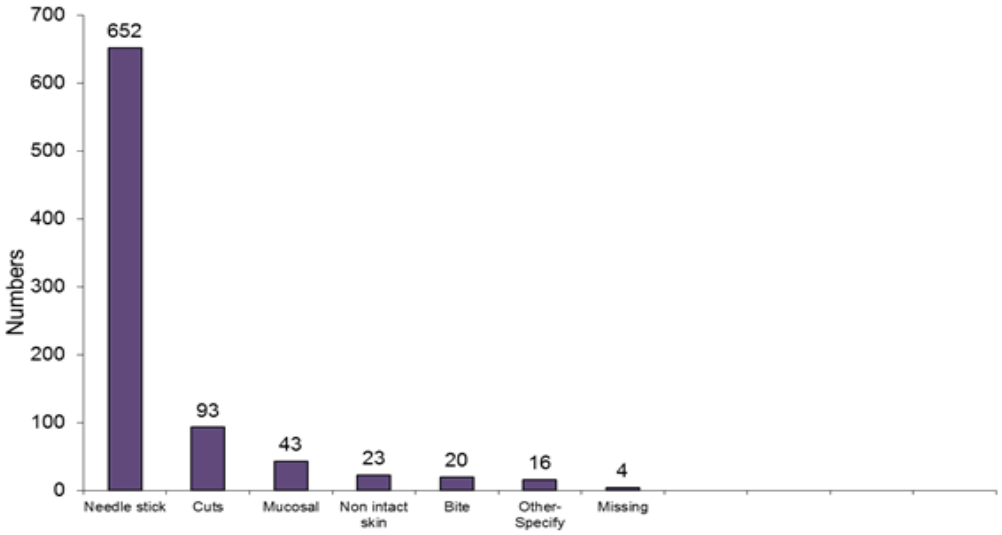
4.4 Types of exposures

The official MOH registers documented the type of exposures as opposed to the black book. Of the 851 exposures recorded in the official registers, needle stick injuries were the highest 652,(76.6%) followed by mucosal exposures 93,(10.9%) and cuts at 43(5.1%) with human bites being the lowest at 4(0.5%).

TABLE 4.2: TYPES OF EXPOSURES

Types of Exposures (N-851)	Total	Total %
Needle Stick	652	76.6
Cuts	43	5.1
Mucosal	93	10.9
None-Intact Skin	20	2.4
Bite	4	0.5
Other -Specify	23	2.7
Missing	16	1.9

FIGURE 4.7: DISTRIBUTION OF TYPES OF EXPOSURES



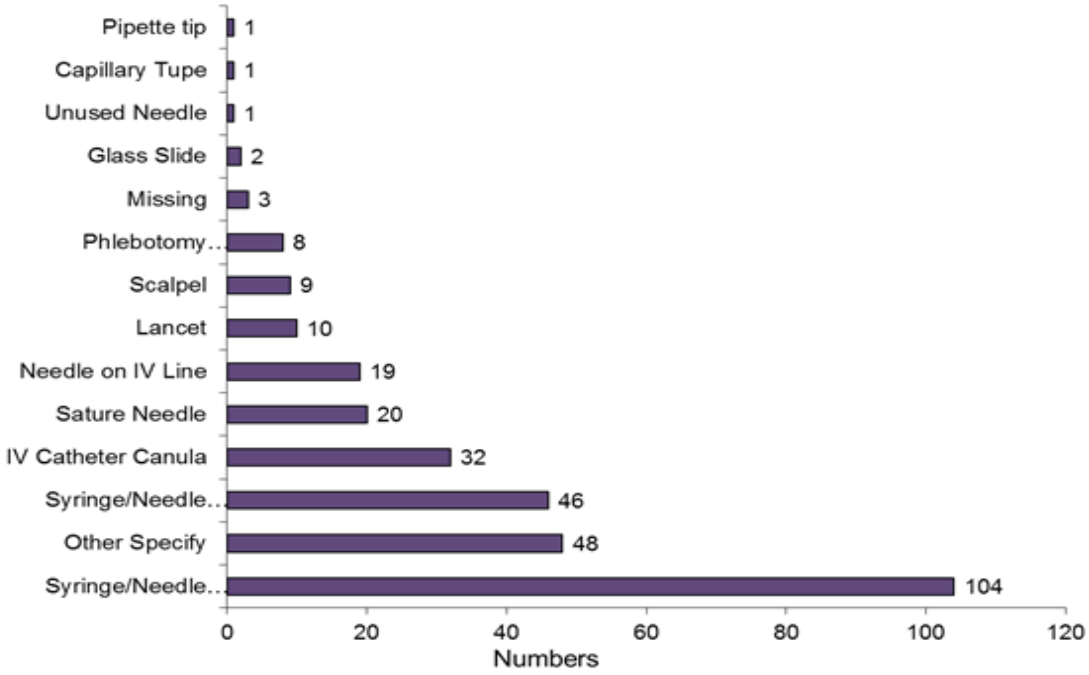
4.5 Devices causing the exposures

The registers used at the sharp surveillance pilot sites had a provision to report on the device used and the procedures carried out. Among the 304 reported exposures in these registers, 104(34.2%) were as a results of syringe/Needle IM/SC injections, 46(15.1%) syringe/needle blood drawing, 32(10.5%) IV catheter cannula. Others like glass tubes, unused needle and glass slide caused minimum exposures. It is worth noting that the phlebotomy needle and vacuum set which is a safety engineered system was associated with relatively lower injuries, 8(2.6%) compared to standard syringe and needle used for blood drawing 46(15.1%).

TABLE 4.3: DEVICE CAUSING EXPOSURE

Distribution of devices causing exposure (N=304)		
Device Causing Exposure	**No.**	**%**
Syringe/Needle IM/SC Injection	104	34.2
Syringe/Needle Blood Drawing	46	15.1
Phlebotomy Needle/Vacuum Set	8	2.6
IV Catheter Cannula	32	10.5
Needle on IV Line	19	6.3
Unused Needle	1	0.3
Lancet	10	3.3
Suture Needle	20	6.6
Scalpel	9	3
Capillary Tube	1	0.3
Glass Slide	2	0.7
Pipette tip	1	0.3
Other Specify	48	15.8
Missing	3	1
Total	304	100%

FIGURE 4.8: DEVICE CAUSING EXPOSURES



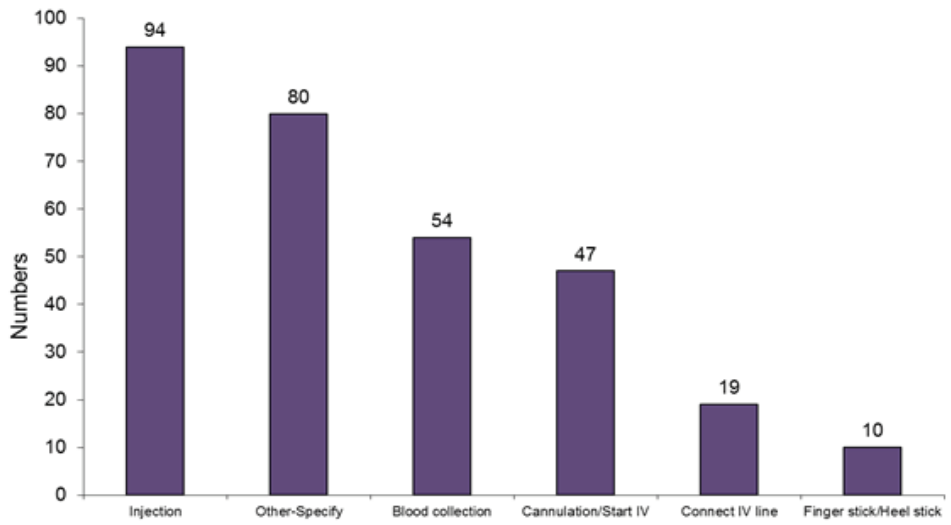
4.6 Procedure resulting to exposure

Of the 304 exposures in which the procedure was described, 94(30.9%) occurred during injections, followed up by blood collection 54(17.8%), cannulation/Start IV 47(15.5%), Connecting IV line 19(6.3%) and 10 Finger stick/Heel stick respectively. 80(26.3) were other unspecified procedures (Table 4.4/Fig 4.9).

TABLE 4. 4: PROCEDURE THE DEVICE WAS BEING USED FOR DURING THE EXPOSURE

Procedure	No	%
Injection	94	30.9
Blood Collection	54	17.8
Cannulation/Start IV	47	15.5
Connect iv Line	19	6.3
Finger Stick/Heel stick	10	3.3
Other Specify	80	26.3

FIGURE 4. 9: PROCEDURE THE DEVICE WAS BEING USED FOR DURING THE EXPOSURE



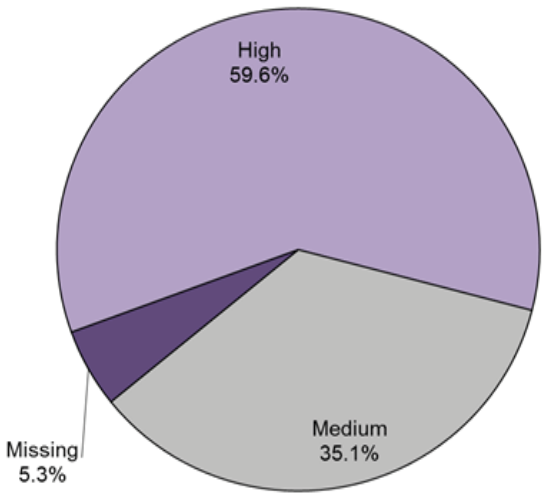
4.7 Risk of exposures

Overall 851 risks of exposures were documented from the 3 MOH PEP registers among this, 507(59.6%) had high risk while 299(35.1%) had medium exposures. Of the 35.1% medium exposures 30% (89/299) were recorded as low in the Pilot register. 45(5.3%) had missing information. The classification of risk was important since NSACOP guidelines recommended PEP for only medium and high risk.

TABLE 4.5: RISK OF EXPOSURES

Risk of exposure	Total (N)	Percentage %
High	507	59.6
Medium	299	35.1
Missing	45	5.3

FIGURE 4.10: RISK OF EXPOSURES



4.8 HIV status of source patient

Of all the 1,665 exposures there was entry on 851 about the HIV status of the source (Table 4.6). Among this, 335(39.4%) source patients were HIV infected, 148(17.4%) source patients were HIV negative and 293(34.4%) source patient statuses were unknown with 75(8.8%) missing information.

TABLE 4.6: HIV STATUS OF SOURCE PATIENT

Source patient/ specimen	No	Percentages
HIV-	148	17.40%
HIV+	335	39.40%
Unknown	293	34.40%
Missing	75	8.80%

4.9 Discussion

Many health workers face workplace exposures to HIV and other blood borne pathogen. The study shows that a significant proportion of patients in our health facilities are HIV infected or of unknown status 82.6%. Only 17.4% of source patients had a confirmed HIV-negative status. This raises concern for possible occupational HIV transmission since more than 8 in 10 injuries would be from a high risk source. This is made worse in the high burden counties where the majority of patients seeking health services are already HIV infected or could be in the window period of HIV infection. The possible explanation for the younger HWs having higher exposures is multi-fold: they are less experienced in carrying out procedures safely, lack of proper and adequate orientation on their work, lack of supervision and mentorship for students, and entry level workers. Whereas the Kenya workforce is aging, it is likely that the younger workers are delegated duties in the facilities.

Among the 1,665 reported exposures, 554(33.3%) did not report the cadre. Among the 1,111 who reported, students had the highest exposures, 282(25.4%) followed by Doctors, 225(20.3%), nurses, 181(16.3%) and clinical officers, 151(13.6%). Waste handlers and VCT counsellors had the least exposures at 17(1.5%) and 11(1.0%) respectively.

The possible explanation for the students having higher exposures is less experienced in carrying out procedures safely, lack of proper and adequate orientation on practical areas, lack of supervision and mentorship. Additionally students with same clinical requirements are likely to overcrowd in one clinical area increasing their risk of exposure. Doctors, Clinical officers and Nurses accounted for 557(50.2%) exposures, this can be attributed to the fact that they are always in clinical areas and they carry out most of the procedures. There was less number of exposures among the laboratory technologist as compared to doctors, clinical officers and nurses this may be due to the use of safety engineered devices for blood collection, however there are those who still use needle and syringe for blood collection.

Procedures that expose HWs to needle stick injuries and splashes are carried out in the departments with most injuries. Most of the injections that are administered for treatment are usually in the medical wards where very sick patients are admitted. These patients receive IM, IV and SC injections, during manipulation of the procedures the HWs can injure themselves. Many procedures are also performed in the theatres and maternity where the risk of sharps injuries including surgical operations, stitching and delivery procedures take place.

Needle stick injury is the most common type of exposure according to the study; this may be due to non-adherence of safe injection practices in health facility as well as lack of safety engineered devices. This finding was surprising considering that a lot of injection safety training has been conducted in Kenya. The JSI-Making medical injections

safer(MMIS) project trained about 25,000 health care workers between 2005 and 2010[13]. There were also a lot of information, education and communication materials developed to support the same.

Most exposures occurred during injections and cannulation, this could be attributed to non-adherence to injection safety practices and most of these procedures are carried out by doctors, clinical officers, nurses and students who according to the study are the most injured. Additionally blood drawing procedures had significant number exposures, which could be due to use of needle and syringe (open system) instead of safety engineered devices (close system).

NASCOP had provided guidelines on how to conduct risk assessment based on fixed criteria that considers status of source, fluid of exposure, and severity of exposure. Although initial guidelines classified the risk as low, medium and high, this was later revised to only low and high. This classification was meant to guide on selection of either two- drug or three- drug regimen.

4.10 Gaps and recommendations

1. Most exposures were reported by students and younger less experienced HWs. We therefore recommend:
   a. An orientation and refresher training to all students and incoming staff.
   b. A review of the preservice training curriculum to include infection prevention control including occupational PEP management prior to attachment in clinical areas.
   c. Close supervision to ensure adherence to safety protocols.

2. HWs in clinical areas had higher rates of exposures. Program reports indicate these cadres of staff usually miss out on the safety trainings [14]. We recommend:
   a. Having continuing medical education (CME) sessions on injection safety, infection prevention and control (IPC) and biosafety that specifically target these cadres.

3. Needle sticks caused a majority of the sharps injuries during therapeutic injections and blood collections. We recommend:
   a. Use of safety-engineered devices
   b. Training on injection safety and safe phlebotomy.

4. The in-patient departments including the medical and surgical wards, maternity units and operation theatres had the majority of exposures. We recommend:
   a. Having department-specific point of contact for IPC and safety issues to follow-up.
   b. Develop departmental specific interventions to improve safety like refresher trainings, job aids on occupational safety, IEC materials, on-job training and mentorship.

13MMIS Project Report, 2010

14NASCOP Phlebotomy training reports, 2010-2014

5. EXTENT OF POST-EXPOSURE PROPHYLAXIS UPTAKE

This chapter describes the results on the extent of PEP use by HWs in the sampled facilities. The results in this chapter reflect data from the official MOH registers with the exception of a few sub sections with data from the black books.

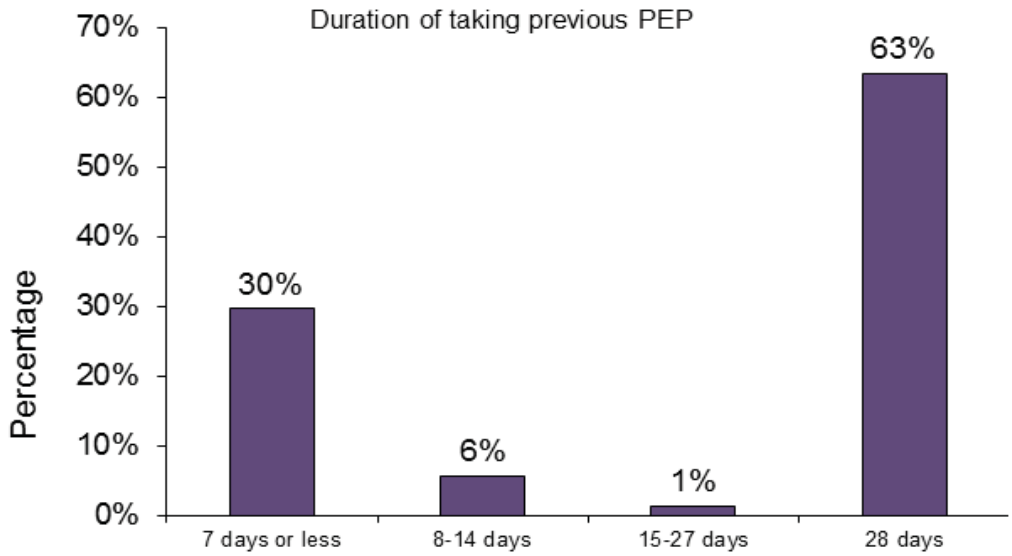
Key points:

1. Weak Institutional support in coordinating availability and accessibility to PEP within two hours of exposure
2. Standard recommended PEP regimen is not adhered to
3. Inadequate documentation of PEP uptake

5.1 Previous PEP use

From the 851 records reviewed from the official MOH registers, 82(10.1%) HWs had previously been on PEP. Seventy one (86.6%) HWs had the duration over which PEP was administered recorded. Of these 45(63%) completed the 28 day regimen, 1(1%) took for 15-27 days, 4 (6%) took for 8-14 days while 21(30%) took for 1-7 days (Fig 5.1).

FIGURE 5. 1: DURATION OF ARV UPTAKE DURING PREVIOUS PEP



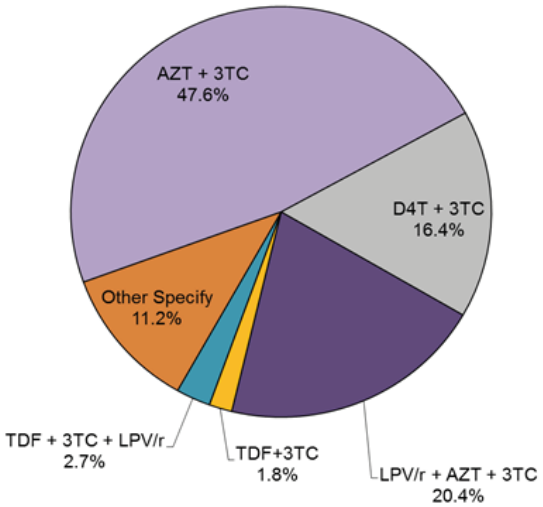
5.2 Regimen of current PEP use

Over the period, there were various editions of the NASCOP treatment guidelines that outlined the regimen to be used for PEP. Out of the 1,665 exposed HWs recorded in all the registers, 1,245(74.8%) had PEP regimen as shown in Table 5.1. The most prescribed regimen was AZT+3TC (592, 47.6%) followed by LPV/r + AZT + 3TC (254, 20.4%) and D4T+3TC at (204, 16.4%).

TABLE 5.1: PEP REGIMEN FOR CURRENT EXPOSURE OF HCW

PEP regimen for current exposure		%
AZT + 3TC	592	47.5502
D4T + 3TC	204	16.38554
LPV/r + AZT + 3TC	254	20.40161
TDF+3TC	22	1.767068
TDF + 3TC + LPV/r	33	2.650602
Other Specify	140	11.24498
Missing*	420	0.252252

FIGURE 5.2: PEP REGIMEN FOR CURRENT EXPOSURE



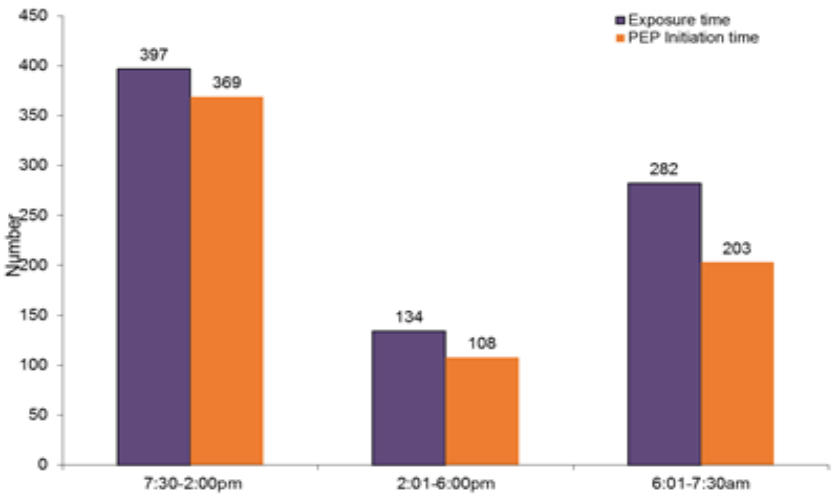
5.3 Time of exposure and PEP initiation

Out of 851 exposures recorded in MOH registers, 813(95.5%) had the time of exposure indicated. Of these 813 (397, 48.7%) occurred between 7:31am- 2.00pm, 201, 16.5% occurred from 2:01pm to 6:00pm then 282, 34.7% occurred from 6:01pm to 7:30am the following day. In terms of PEP initiation the 7:30am – 2.00pm time period recorded the highest 369(54.3%) as compared to afternoon and night as shown in the Table 5.2.

TABLE 5.2: TIME OF EXPOSURE VS PEP INITIATION TIME

	7:31am - 2:00pm	2:01pm - 6:00pm	6:01pm - 7:30am
Exposure time	397 (48.7%)	134 (16.5%)	282 (34.7%)
PEP Initiation time	369 (54.3%)	108 (15.9%)	203 (29.9%)

FIGURE 5.3: TIME OF EXPOSURE VS TIME OF PEP INITIATION



5.4 Discussion

According to the WHO guidelines 2007 on post-exposure prophylaxis, different regimens for different circumstances are recommended, with two drugs as the standard and addition of a third drug in situations of known risk of ARV drug resistance in the source person or the community[15]. More recent national guidelines have shifted towards recommending a three-drug regimen for everyone, given the availability of less toxic and better tolerated medications, the difficulty in evaluating the risk of drug resistance and need to simplify prescribing[16].

15WHO/ILO Post-exposure prophylaxis to prevent HIV infection : joint WHO/ILO guidelines on post-exposure prophylaxis (PEP) to prevent HIV infection, 2007 (http://apps.who.int/iris/bitstream/10665/43838/1/9789241596374_eng.pdf)

16Kuhar DT, Henderson DK, Struble KA, Heneine W, Thomas V, Cheever LW, et al. Updated US Public Health Service guidelines for the management of occupational exposures to human immunodeficiency virus and recommendations for postexposure prophylaxis. Infect Control Hosp Epidemiol Off J Soc Hosp Epidemiol Am. 2013;34:875–92.

The addition of a third drug increases the potential for drug-related toxicity, and reported post-exposure prophylaxis completion rates are similar comparing two-[17], [18] and three-drug[19], [20] regimens. The findings are consistent with the recommendations from WHO guidelines as the health facilities sampled adhered to the recommended regimen as per the Kenya ART guidelines over the years with majority on a two drug regimen. However, there was a gap in documentation of the regimen administered to the HWs in about 25% of the sampled facilities. This could be attributed to inadequate knowledge on PEP, negative attitude towards PEP and the stigma associated with HIV, as reflected by the poor documentation practices by health workers alongside weak and poorly coordinated structures for administering and documenting PEP uptake[21].

According to WHO guidelines, it is recommended that when a potential occupational exposure to HIV occurs, every effort should be made to initiate PEP as soon as possible within 2 hours. A first dose of PEP should be offered to the exposed worker while the evaluation is underway[22]. Data from animal models of PEP have shown that effective antiretroviral treatment is most likely to prevent infection when initiated within 24 to 36 hours of exposure. Lack of institutional support is an important barrier for HW's compliance with taking PEP. Because the drugs for HIV PEP need to be started as soon as possible, hospitals should have better preparation of the availability and accessibility to the drugs.

From this evaluation, most of the exposures occurred in the morning hours (48.7%) and in the night (34.7%). This could be attributed to the number of procedures done during the morning hours and also because the medical students who are mostly affected according to the study are on duty under supervision at such hours of the day. In addition, during the night shift, the working hours are long with few HWs on duty leading to burn out, which puts them at risk of occupational exposure. These findings reflect some studies indicating that, a higher incidence of BBF exposures was found among workers who reported higher workloads, extended working hours, and inadequate working conditions. Working conditions can have an impact on health status and physical and mental ability, which can also increase the risk of injury. The study also indicates that the PEP initiation timing is good during the morning hours since there is better coverage of duties unlike the other timings of the day. Evidently the night exposures have reduced numbers of those initiated on PEP which means the coordination of structures to ensure the 24 hours availability of the PEP programs in the facilities are not in place.

17Mayer KH, Mimiaga MJ, Cohen D, Grasso C, Bill R, VanDerwarker R, et al. Tenofovir DF plus lamivudine or emtricitabine for nonoccupational postexposure prophylaxis (NPEP) in a Boston Community Health Center. J Acquir Immune Defic Syndr. 2008;47:494–9.

18Okulicz JF, Murray CK. Evaluation of HIV postexposure prophylaxis for occupational and nonoccupational exposures at a deployed U.S. military trauma hospital. Mil Med. 2012;177:1524–32.

19Grime PR, Ris L, Binns C, Carruthers JR, Williams S. Pan-Thames survey of occupational exposure to HIV and the use of post-exposure prophylaxis in 71 NHS trusts. J Infect. 2001;42:27–32.

20Wang SA, Panlilio AL, Doi PA, White AD, Stek M, Saah A. Experience of health care workers taking postexposure prophylaxis after occupational HIV exposures: findings of the HIV Postexposure Prophylaxis Registry. Infect Control Hosp Epidemiol. 2000;21:780–5.

21Mill, Judy, Esther Nderitu, and S. Richter. "Post-exposure prophylaxis among Ugandan nurses:“Accidents do happen”." International Journal of Africa Nursing Sciences 1 (2014): 11-17.

22WHO, Guidelines on Post-Exposure Prophylaxis for HIV and the Use of Co-Trimoxazole Prophylaxis for HIV-Related Infections Among Adults, Adolescents and Children: Recommendations for a Public Health Approach: December 2014 supplement to the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Geneva: World Health Organization; 2014 Dec.

6.COMPLETION RATES FOR PEP AND SUBSEQUENT FOLLOW-UP LABORATORY TEST

This chapter describes the PEP completion rates of HW and reasons for non-completion. It also describes the baseline HIV status of the source and the HW. Further it describes the follow-up HIV status and notes any sero-conversion during the follow-up period.

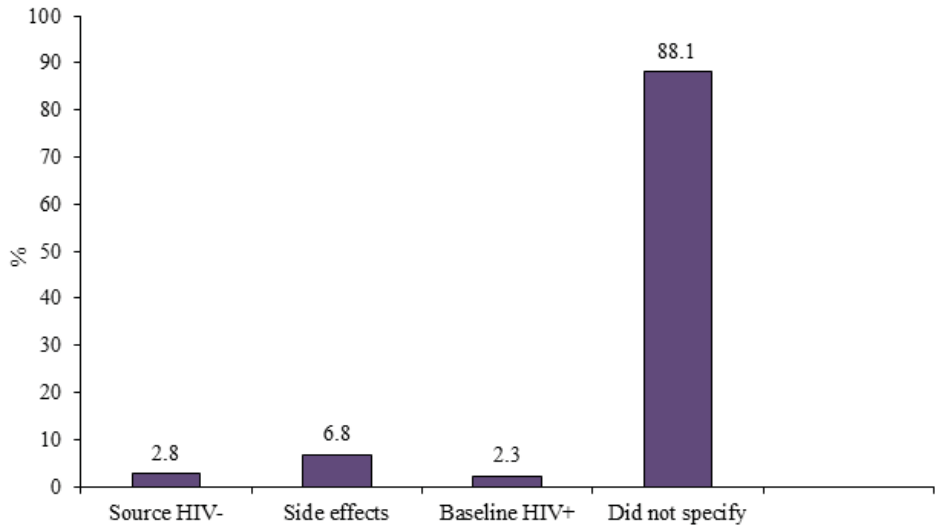
Key notes:

1. Baseline HIV status for HWs was well documented (86%)in MOH registers
2. Documentation of PEP Completion was low
3. Only 1 in 20 health workers adhered to the required 6 months follow up.

6.1 Completion rates for PEP

Of the 1,665 HCW exposed, 851 exposures recorded in the MOH registers were initiated on PEP, only 301(35.37%) were reported to have completed PEP. Of the remaining 550, a total of 177 did not complete PEP due to various reasons and 373 had missing PEP completion data. Of the 177 who did not complete PEP, 5(2.8%) was because the HIV status from the source was negative, 12(6.8%) because of side effects, 4(2.3%) because their baseline HIV was positive and 156 (88.1%) did not specify the reason for non-completion.

FIGURE 6. 1: REASONS FOR NON COMPLETION



6.2 Discussion

Majority of HWs did not complete PEP due to side effects which could have been attributed to poor adherence counselling. The source negative status had great influence in PEP completion and this shows that there is knowledge gap on HIV window period. There is very high number of missing data that depicts poor documentation and also poor follow up.

Adherence to a full 28-day course of ARV drugs for post-exposure prophylaxis is critical to the effectiveness of the intervention. A systematic review of published post-exposure prophylaxis studies demonstrates that completion rates are generally low (56%, 95% CI 50.9–62.2%) for all populations and particularly for adolescents and individuals following sexual assault .

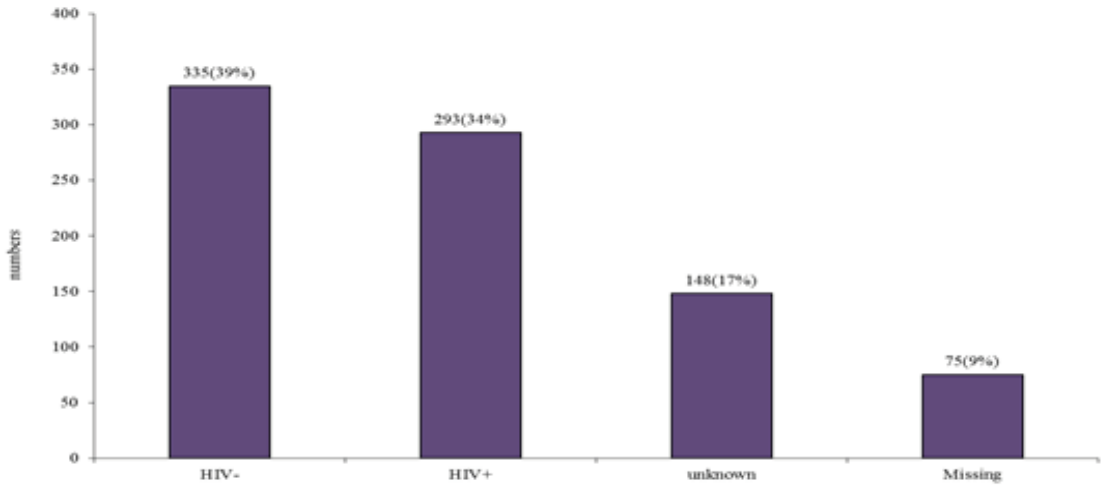
Drug intolerance is found to affect adherence to PEP guidelines, but the current effort in monitoring drug toxicity is far from adequate. Adverse effects of PEP drugs, most frequently gastrointestinal symptoms, should be controlled promptly to avoid worse consequences.

6.3 Laboratory Follow up for exposed Health Worker

6.3.1 HIV status of source

The findings from the official MOH registers showed that out of the 851 exposed HWs, 335(39.4%) source patients were HIV-, 293(34.4%) were HIV+, 148(17.4%) had unknown status while 75(8.8%) had missing information on the status of HIV of source patient.

FIGURE 6.2: HIV STATUS OF SOURCE PATIENT /SPECIMEN



6.3.2 Baseline HIV Status and follow up for exposed health workers

Out of the 851 exposed HWs, 112(13.1%) had missing information on this variable and was also not included in this section. Of the 739(86.83%) HWs who were tested for HIV, 712(96.3%) were negative and 10(1.35%) tested HIV positive. 14(1.9%) deferred the HIV test. On laboratory follow up, 185 of 739 HWs came back after 6 weeks, 184(99.46%) were HIV negative and 1(0.54) was HIV positive. Of the 134 who came for follow up after 3 months, 133(99.2%) were HIV negative and 1(0.8%) was HIV positive. Of the 95 who came for follow up after 6 months, 93(99.9) were HIV negative and 2(2.1%) were HIV positive. Of the 134 followed up at 3 months, 116 were part of the 6 weeks follow up. Of these, one HW had a reactive HIV test at 6 weeks which was also recorded at 3 months. There was one new reactive HIV test at 6 months bringing the total number to two (2).

FIGURE 6.3: BASELINE HIV STATUS AND FOLLOW UP FOR EXPOSED HEALTH WORKERS

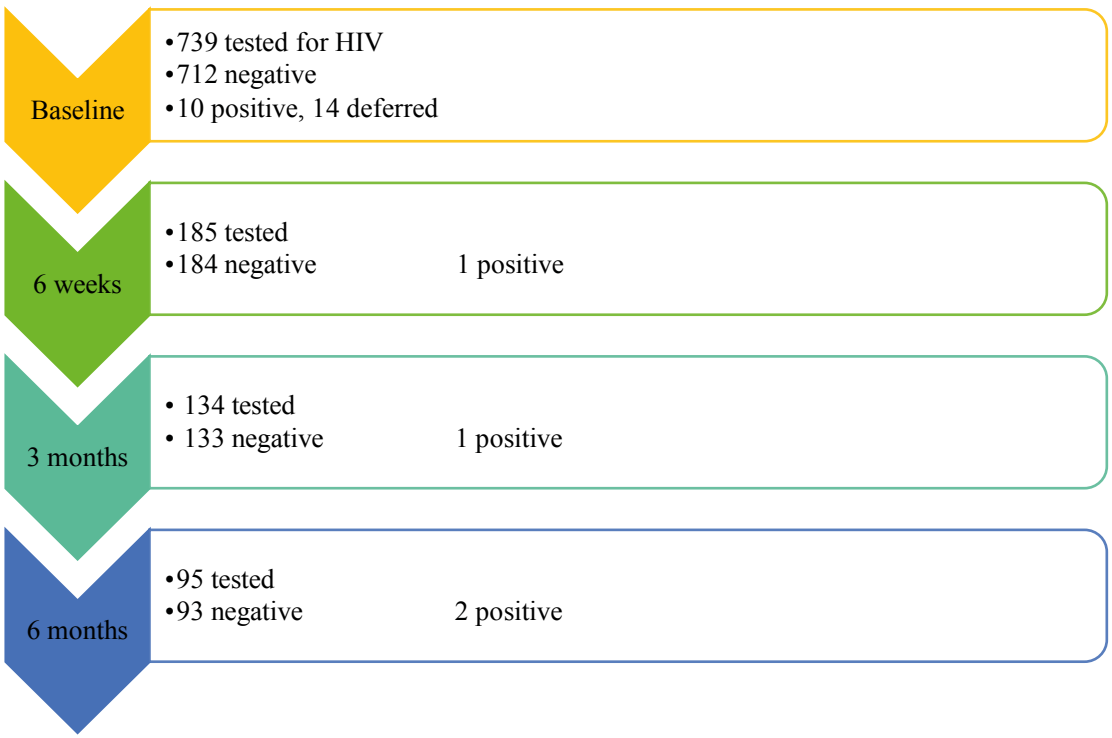


TABLE 6.1: HIV SERO-CONVERSION RATES AT DIFFERENT INTERVALS

	HIV status at 6wks		3 months		6 months	
	N	%	N	%	N	%
No. Positive	1	0.54	1	0.75	2	2.11
No. Negative	184	99.46	133	99.25	93	97.89

6.5.3 Discussion

HIV testing of the source person should be conducted to guide appropriate clinical action and inform the exposed individual and, where possible, the source of their HIV status. However, the initiation of post-exposure prophylaxis should not be delayed by the availability of the source HIV test results. Assessment for eligibility should be based on the HIV status of the source whenever possible and may include consideration of background prevalence and local epidemiological patterns. The study showed 43.2% of the source patients were HIV positive.

The initial HIV testing for the exposed HW should be performed using rapid diagnostic tests that can provide definitive results in most cases within 2 hours and often within 20 minutes. HIV testing as in all other situations should be voluntary, and consent for HIV testing should be obtained with standard pre-test and post-test counselling according to national and local protocols. The risks and benefits of testing should be sufficiently explained to the individual so that an informed decision can be made. Every exposed health worker should be re-evaluated within 3 days of the exposure to allow for further clarification of the nature of the exposure, review of available source patient data, and evaluation of adherence to and toxicities associated with the PEP regimen. HIV sero-conversion will generally occur within 2 to 4 weeks if chronic HIV infection develops after an exposure. HIV testing at baseline, 6 weeks, 3 months and 6 months is recommended after significant exposures, regardless of whether the worker accepts or declines PEP treatment. Post-exposure prophylaxis is not indicated if the exposed person is already HIV positive. They should be referred to appropriate services for assessment for eligibility for ART according to national guidelines.

Although HIV testing at 6 months after exposure is still recommended, late sero-conversion (i.e., after 3 months) has been rarely reported and has not been described since 1990[24,25]. It is unclear if these rare events were related to the original or subsequent exposures. Taking into consideration the infrequency of this occurrence, there is increased sensitivity of standard HIV tests to detect early infection and sero-conversion, and the added anxiety and significant consequences of an additional 3 months of precautions and testing for exposed workers.

Most (43.2%) source patients were HIV+ as compared to 37.8% with unknown status and 19.1% with a HIV- status. The reason may be that HWs are highly likely to access PEP when the source is HIV+. Also an increasing number of HIV+ patients are seeking care for treatment and or monitoring.

From this evaluation, there was a high number of missing information on the follow ups which increased with the visits scheduled for the exposed health workers. This gap in documenting made it difficult to understand and compare the outcomes with the worldwide known numbers despite the dissemination of guidelines for the management of occupational exposures to HIV to the facilities.

24Garcia MT, Figueiredo RM, Moretti ML, Resende MR, Bedoni AJ, Papaiordanou PMO. Postexposure prophylaxis after sexual assaults: a prospective cohort study. Sex Transm Dis. 2005;32:214–9.

25Kahn JO, Martin JN, Roland ME, Bamberger JD, Chesney M, Chambers D, et al. Feasibility of postexposure prophylaxis (PEP) against human immunodeficiency virus infection after sexual or injection drug use exposure: the San Francisco post-exposure prophylaxis Study. J Infect Dis. 2001;183:707–14.

7. HEPATITIS B (HBV) STATUS OF SOURCE PATIENTS AND EXPOSED HEALTH WORKERS

This section describes the status of HBV of the source patient and the exposed HW and their hepatitis B vaccination status.

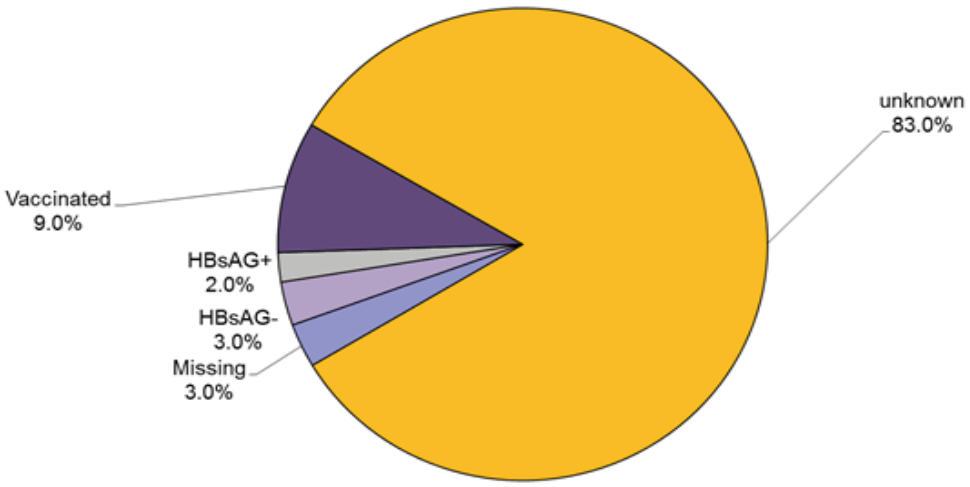
Key Findings:

1. There was low (5%) testing of HBV status in source patients and 83% had unknown
2. Only 172 (20%) of the health workers were fully vaccinated for HBV
3. Only 116 (13.6%) the health workers had their own baseline HBV test done

7.1 HBV Status of Source

Results from the MOH register indicated that majority of the source patients 703(83%) had unknown HBV status. Only 41(5%) source patients were tested for HBV and of these 15(36.6%) were HBV positive.

FIGURE 7.1: HEPATITIS B (HBV) STATUS OF SOURCE PATIENTS



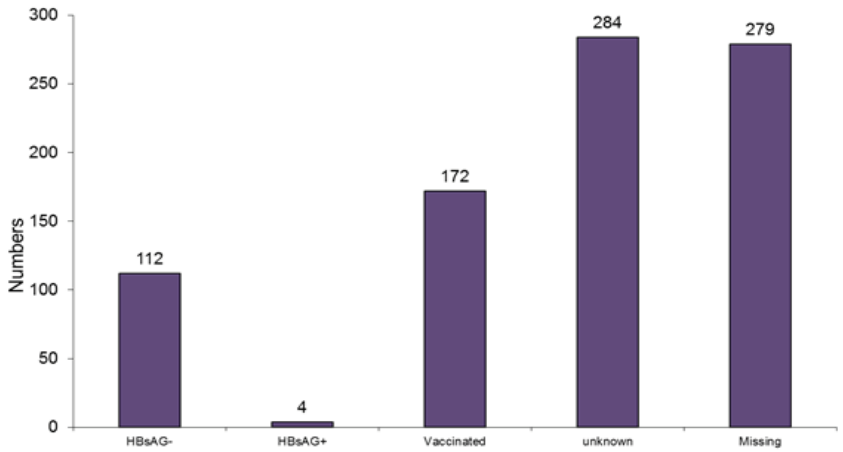
7.2 HBV status of exposed health workers

Out of the 851 HWs in the MOH PEP register, 118 (13.9%) were tested for HBV surface antigens, 4 (0.47%) were positive and 284 (33.37%) were unknown. Only 172 (20.21%) were vaccinated against HBV as indicated in the table.

TABLE 7. 1: BASELINE HBV STATUS OF EXPOSED HEALTH WORKERS

Baseline HBV Status of Exposed Person	Numbers	%
HBsAg-	112	13.2
HBsAg+	4	0.5
Vaccinated	172	20.2
Unknown	284	33.4
Missing	279	32.8

FIGURE 7. 2: HBV STATUS OF THE HEALTH WORKERS



7.3 Discussion

When an occupational exposure occurs, the source patient should be evaluated for both hepatitis B and hepatitis C. The risk of transmission of HBV and HCV from an occupational exposure is significantly greater than the risk of HIV transmission[26].

26Hu, D. J., M. A. Kane, and David L. Heymann. "Transmission of HIV, hepatitis B virus, and other bloodborne pathogens in health care settings: a review of risk factors and guidelines for prevention. World Health Organization." Bulletin of the World Health Organization 69.5 (1991): 623.

Health workers are at high risk of acquiring blood borne pathogens including HBV through occupational exposure to blood and body fluids. Worldwide occupational exposures account for 37% of HBV among health workers[27]. In Kenya, HBV prevalence in the general population ranges between 11.4-13.3%[28] [29], and health workers are estimated to be at four times higher risk of infection than the general population. Although HBV is highly transmissible, it is preventable by vaccination. HBV vaccination coverage among health workers was low due to lack of awareness, low risk perception, low priority given by health management teams, and poor coordination among various departments on reporting, testing and vaccination.

This evaluation explored baseline testing for HBV and vaccination status of exposed HWs and the results were in tandem with the various studies worldwide. Most source patients (83%) had unknown HBV status as compared to the HWs (33.37%), which shows the low attention, given to HBV prevention to the general population by the MOH. The number of exposed health workers of source patients with known HBV status was low. This could mean that the purpose of the HBV testing of source patient was for patient treatment rather than the management of the exposed health worker and/or the injuries occurred when the HWs was carrying out a procedure on a known HBV+ person. For whatever reason, it is evident that 36.6% of health workers that were exposed to sources of known HBV status had an HBV+ source. This is of concern since HBV is highly transmissible.

HBV vaccination of the exposed health workers was low at 20.21%. About a half of the HWs had unknown HBV status and those who had a baseline HBV test, 13.6 % were HBV negative and 4(0.47%) HBV positive. Therefore majority of the exposed health workers were susceptible to HBV infection.

27Pruss Ustur A, Rapiti E, Hutin Y Sharps injuries: Global burden of disease from sharp injuries to health workers, WHO 2003

28Hyams C., Okoth F., Tukei M., Mugambi M., Johnson B., Morill J.,et al. Epidemiology of hepatitis B in Eastern Kenya. Journal of medical virology: Vol. 28, doi: 10.1002/jmv.1890280210

29Kerubo, Glennah, et al. "Hepatitis B, hepatitis C and HIV-1 coinfection in two informal urban settlements in Nairobi, Kenya." PloS one 10.6 (2015): e0129247.

Gaps and recommendations

1. Documentation of the PEP regimen administered, PEP completion and HIV and HBV status of the source patient and the exposed health care worker. We thus recommend:
   a. Training of the health workers on importance of quality data
   b. Management of data

2. There is delay in administering PEP within the first two hours of occupational exposure. We therefore recommend:
   a. Storing and monitoring of PEP drugs at an accessible point within 24 hours to shorten the time from exposure to initiation within the institution.
   b. To have in place a telephone or in-person consultation with an experienced HIV provider or occupational health clinician experienced in providing PEP. This will make it possible to administer the pep at any given time of the night.

3. Weak follow up system after occupational exposure and PEP uptake made it difficult to understand the outcomes and monitor adherence.

Recommendation:
   a. Improve institutional structures in the coordination and management of PEP services.
   b. Provide PEP standard operating procedures to all health institutions

8. IMPLEMENTATION OF mPEP SYSTEM

8.1 Introduction

mPEP System is a mobile telephone based system that was developed through the PEPFAR support to be implemented amongst all health workers. The objectives for its development was to promote PEP uptake; improve adherence to PEP ARV drugs; support side effect management; improve compliance to follow up visits for clinical and psychosocial review; improve on completion of laboratory monitoring; creation of database of injury and other exposures; and, creation of real-time surveillance system on occupational exposures. During the period under review (2011-2014) mPEP had been rolled out to 125 facilities. One of the objectives of this evaluation was to assess implementation and utilization of the mPEP system in Kenya.

This chapter describes the coverage of m-PEP training and the proportion of m-PEP implementing HCF. It also looks at the HW registration into the system and the actual reporting rates through m-PEP.

8.2 Facilities reporting through the mPEP system

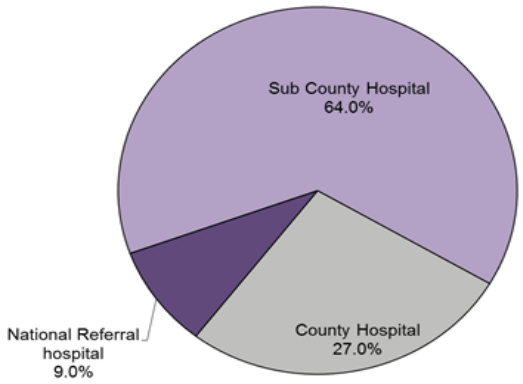
TABLE 8. 1: DISTRIBUTION OF HEALTH FACILITIES REPORTING IN THE MPEP SYSTEM

System Level of facility	**Health Centre**	**Sub-county Hospital**	**County Referral Hospital**	**National Referral**	Total
Number of facilities accessed	9	24	18	2	**53**
Number of facilities trained on mPEP	0	14	6	2	**22**
Number of facilities reporting exposures	0	10	6	2	**18**
Number of injuries by facility level reported in mPEP	0	32	31	6	**69**

Out of the 53 facilities that were assessed, 22 had been trained on the mPEP System out of which 18 facilities reported 69 injuries into the mPEP System. Table 8.1 shows the distribution of the facilities by levels. 18% of facilities trained did not report exposures into the mPEP system.

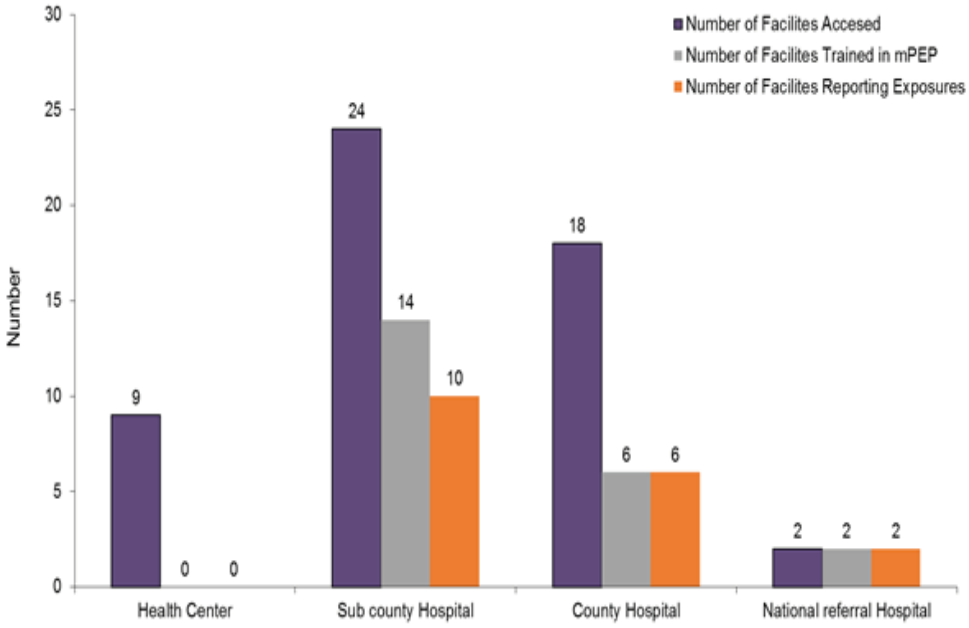
Out of the 18 facilities that reported, 64% of the mPEP reports came from the sub-county hospitals.

FIGURE 8. 1: PROPORTION OF MPEP IMPLEMENTING FACILITIES BY LEVEL



Most of the injuries came from sub-County Hospitals and County Referral Hospitals and none of the health centres assessed were trained on mPEP System and therefore no PEP related reports were expected. Figure 8.2 shows that the mPEP System training had an impact to the mPEP System uptake.

FIGURE 8.2: NUMBER OF FACILITIES TRAINED AND REPORTING EXPOSURES



Out of the 53 facilities assessed, 22 facilities were trained on mPEP System out of which 64% were sub-county level and 27% were county level facilities. The highest number of mPEP implementing facilities came from the sub-county facilities followed by the county facilities.

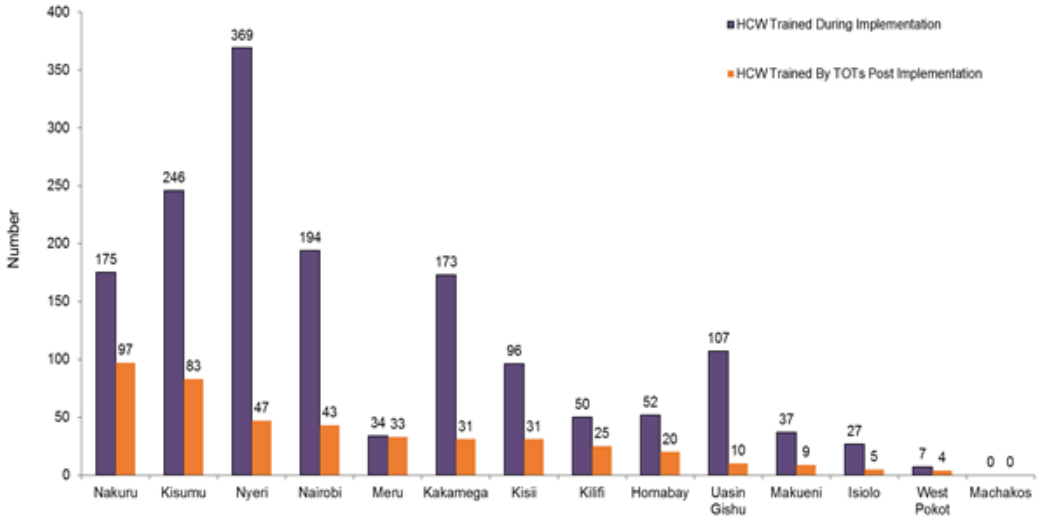
8.3 Health care worker training and registration into the mPEP system

TABLE 8. 2: HEALTH WORKERS TRAINED AND REGISTERED INTO MPEP SYSTEM

County	HWs Trained	HWs Registered in mPEP	Total Injuries Reported
Homa Bay	52	72	10
Isiolo	27	32	2
Kakamega	173	204	4
Kilifi	50	75	1
Kisii	96	127	10
Kisumu	246	329	14
Machakos	0	0	1
Makueni	37	46	3
Meru	34	67	7
Nairobi	194	237	5
Nakuru	175	272	3
Nyeri	369	416	8
UasinGishu	107	117	2
West Pokot	7	11	4
Grand Total	**1,567**	**2,005**	**74**

From the facilities assessed, the 18 that were implementing mPEP system were distributed in 14 counties as in Table 8.2. A total of 1,567 received training during the implementation of the system through continuing medical education through the implementing partner. During the training, the health workers also registered into the mPEP System. This made 78% of health workers that were registered into the mPEP System. There were 2005 health workers registered into the system, which means additional 438(22%) were trained and registered into the mPEP system post implementation through the training of trainer (TOTs) sessions held at the facility levels.

FIGURE 8.3: COUNTY TRAINING BEYOND MPEP PROJECT ROLLOUT

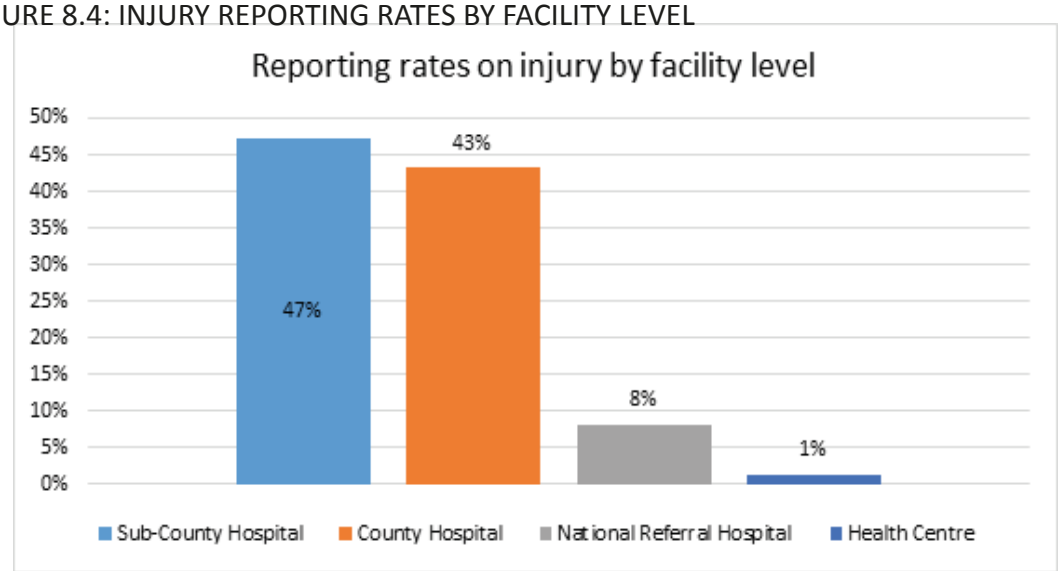


The figure above shows the distribution of health workers trained post mPEP rollout by counties. Over 50% of health workers trained post implementation of the system was distributed across 3 counties. These were Nakuru 22%, Kisumu 19% and Nyeri 11%.

8.4 Reporting rates through the mPEP system

In the 22 facilities where mPEP had been rolled out, a total of 74 injuries were reported through the mPEP system. This low reporting rate could have been attributed to lack of awareness about the system as well as technical challenges that were experienced in rolling out the system.

FIGURE 8.4: INJURY REPORTING RATES BY FACILITY LEVEL



8.5 Gaps and Recommendations

1. There was low utilization of the mPEP system:
   a. The implementation phase of the system was not carried out efficiently to improve system uptake by health workers.
   b. The system was available to only one mobile service provider platform hence challenges in network connectivity to access the system through other networks.
   c. Low mobile network coverage in remote areas contributed to low utilization of the system.

2. There was minimal impact on the mPEP system:
   a. Poor acceptability and ownership of the system at the facility level.
   b. The previous database of the system did not have adequate components for accessibility to check for the impact through reporting and dashboards at the county and national level.
   c. High staff attrition of health workers at the facility level and poor handover proce dures resulted in discontinuity in system use.

Recommendations

a. There is need to engage relevant stakeholders from the onset of the project, including formation of technical working groups.

b. Continuous reviewing of the technical operations of the system to ensure it operates as per user requirements.

c. Capacity build health workers through re-sensitization, this can be done in a phased implementation of a minimal of ten facilities with highest exposures.

d. Need for the program to continuously work with facility established infection prevention and control (IPC) committees to ensure they support implementation

e. There is need to link this to other reporting systems.

1. Appendices

APPENDIX 1: Facility profile and PEP services

A: Information from facility management/records office

1. Name of facility:

2. MFL Code:

3. Level of facility:

4. County of facility:

5. Average outpatient numbers per day:

6. Number of beds:

7. Average bed occupancy rate……..

8. Number of health workers
a. Doctor:
b. Clinical officer:
c. Nurse:
d. Laboratory technologist:
e. Cleaners:
f. Waste handlers:
g. VCT Counsellor:
h. Student:
i. Other-specify:

9. Do you have an IPC committee? Yes……. No……

10. For a Health Centre: Do you have an IPC Focal Person? Yes……. No……

11. How do you treat your health care waste?

……
……
……
……

B: Information from officer who provides PEP in the facility

12. Is PEP offered for 24hours? Yes……. No……

13. Where is PEP provided from? :……

14. Who is in charge of PEP in this facility? :……

15. Do you use the PEP register for occupational exposures? Yes……. No……

16. Do you use a separate PEP register for rape/sexual assault or other exposures? Yes…….. No…….

17. Is mPEP system implemented in this facility? Yes……. No…….

18. When did you start using mPEP system?

APPENDIX 2: Data Abstraction Tool

PEP REGISTER DATA ABSTRACTION SPREADSHEET

Date of Data Collection		Facility MFL code		Name of Facilty		Data Collector	

Serial Number	Date	Client ID	Participant's Number	Age in Years	Sex	Cadre	Date of exposure	Time of exposure	Location of exposure	Nature of exposure	Severity of exposure	HIV status of source	HBV status of source	Risk of HIV	If previous on PEP, what regimen	If previous on PEP, how many days	Date of current PEP initiation	Time of current PEP initiation	PEP regimen for current exposure	Baseline HIV status of exposed HCW	Baseline HIV status of exposed HCW	Date for PEP completion	Reasons for not completing PEP	HIV status at 6 weeks	HIV status at 3 months	HIV status at 6 months	Remarks/Referral

NASCOP

NATIONAL AIDs & STIs
CONTROL PROGRAM

National AIDS & STI Control Programme
Afya Annex
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P.O Box 19361 - 00202, Nairobi, Kenya.
Tel : +254-775597297
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