UTILIZATION OF HIV POST EXPOSURE PROPHYLAXIS AMONG HEALTHCARE WORKERS IN SELECTED HEALTH INSTITUTIONS IN NAIROBI, KENYA

BY

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university or any other award.

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DEDICATION

This thesis is dedicated to the **Glory** of **God** for His ever-abundant **Grace** .To my son, who have given me love and support throughout this study.

For them this work is but an inadequate dedication.

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OPERATIONAL DEFINITION OF TERMS

Occupational exposure: For the purpose of this study, occupational exposure is defined according to the recent CDC definition as; a percutaneous injury (e.g. a needle stick or a cut with a sharp object), contact of mucous membranes, or contact of skin (especially when the exposed skin is chapped, abraded or afflicted with dermatitis or the contact is prolonged or involving an extensive area) with blood, tissues, or other body fluids to which universal precautions apply including: (a) semen, vaginal secretions or other body fluids contaminated with visible blood, because these substances have been implicated in the transmission of HIV infection; (b) cerebrospinal fluid, synovial fluid and amniotic fluid, because the risk of transmission of HIV from these fluids has not yet been determined; and (c) laboratory specimen that contain HIV (e.g., specimens of concentrated virus), during performance of job duties.

Post exposure prophylaxis: This refers to the use of antiretroviral drugs within hours of exposure to HIV in an attempt to prevent development of an infection.

Universal precautions (UPs): This is a strategy of universal blood and fluid precautions to address concern regarding transmission of HIV in the health care settings. The concept now referred to simply as "*universal precautions*" stresses that all patients should be assumed to be infectious for HIV and other blood borne pathogens. These precautions should be followed when workers are exposed to blood, certain body fluids or any body fluid visibly contaminated with blood. HIV transmission has not been documented from exposures to other body fluids

(sweat, sputum, urine, tears, vomitus, mucous and faeces) and therefore the UPs do not apply to them. UPs also do not apply to saliva, except in the dental settings where it is likely to be contaminated with blood (CDC, 1989).

Exposed health care worker: This is an individual exposed as described above while performing normal job duties.

Percutaneous exposure: This is exposure through non- intact skin.

Needle stick injury: This includes puncture with a needle or sharp instrument that is visibly contaminated with blood.

Splashes: This is visible contamination of skin or mucous membranes with blood.

Health care worker: Is defined as any person e.g. employee, student, attending clinician etc whose activities involve contact with patients or blood or other body fluids from patients in a health-care, laboratory, or public-safety setting.

GLOSSARY OF ABBREVIATIONS

3TC	LAMIVUDINE
AIDS	ACQUIRED IMMUNEDEFICIENCY SYNDROME
AKH	AGA KHAN HOSPITAL
ARVs	ANTIRETROVIRAL DRUGS
AZT/ZDV	ZIDOVUDINE
CBS	CENTRAL BUREAU OF STATISTICS
CDC	CENTRES FOR DISEASE CONTROL & PREVENTION
CMV	CYTOMEGALOVIRUS
D4T	STAVUDINE
DDC	ZALCITABINE
DDI	DIDANOSINE
DNA	DEOXYRIBONUCLEIC ACID
FGDs	FOCUS GROUP DISCUSSIONS
GOK	GOVERNMENT OF KENYA
HAART	HIGHLY ACTIVE ANTIRETROVIRAL THERAPY
HBV	HEPATITIS B VIRUS
HCV	HEPATITIS C VIRUS
HCW	HEALTH CARE WORKER
HIV	HUMAN IMMUNODEFICIENCY VIRUS
HTLVI, II	HUMAN T LYMPHOTROPIC VIRUS I,II
KANCO	KENYA AIDS NGO CONSORTIUM
KEMRI	KENYA MEDICAL RESEARCH INSTITUTE
KNH	KENYATTA NATIONAL HOSPITAL
MDH	MBAGATHI DISTRICT HOSPITAL
MOH	MINISTRY OF HEALTH
MSF	MEDICINS SANS FRONTIERES
NASCOP	NATIONAL AIDS & STIs CONTROL PROGRAMME
NNRTIs	NON-NUCLEOSIDE ANALOGUE REVERSE TRANSCRIPTASE INHIBITORS
NRTIs	NUCLEOSIDE ANALOGUE REVERSE TRANSCRIPTASE INHIBITORS
OSHA	UNITED STATES OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
PCR	POLYMERASE CHAIN REACTION
PEP	POST EXPOSURE PROPHYLAXIS:
PIs	PROTEASE INHIBITORS
RNA	RIBONUCLEIC ACID
STIs	SEXUALLY TRANSMITTED INFECTIONS
UNAIDS	JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS
UPs	UNIVERSAL PRECAUTIONS

WHO WORLD HEALTH ORGANIZATION

ABSTRACT

Although avoiding contact with infected blood is one of the primary strategies of preventing occupationally acquired Human Immunodeficiency Virus (HIV) infection, appropriate post-exposure management (PEP) is an important element in workplace safety. The concern to optimise such interventions is heightened if the institution caters for populations in which the prevalence of HIV is high, as is the case of health facilities in Nairobi Province, Kenya. In their practice the exposure of Health Care Workers (HCWs) to blood and other potentially infectious body fluids is of major concern and justifies a specific prevention and surveillance strategy.

This was a descriptive cross-sectional study that sought to establish the main factors that underlie utilization of PEP services among the occupationally exposed Health Care Workers in Nairobi Province, Kenya. The instruments used for data collection included a questionnaire for HCWs in direct care of patients, a question guide for focus group discussions (FGDs) and interview schedules for hospital administrators in charge of the infection control units and the pharmacists in the hospitals. Four research assistants were recruited and trained to assist in data collection.

A total of 179 purposively sampled health-care workers consisting of nurses, physicians, surgeons, dentists and laboratory personnel were interviewed. Three focus group discussions were carried out among HCWs in the three hospitals

namely Kenyatta National Hospital, Aga Khan Hospital and Mbagathi District Hospital.

Knowledge of risk of occupational HIV transmission and available options for PEP was below average with only 54.8% having adequate knowledge. Although the majority (92.2%) of the respondents strongly believed that they were at risk of contracting HIV/AIDS from occupational exposure and 83.2% of these had taken a protective measure against occupational exposure to HIV, they did not know the options available for PEP. However, they also correctly identified other blood borne diseases that pose a risk to the HCWs at the work place such as Hepatits B virus (HBV), Hepatitis C virus (HCV) and Human T Lymhotropic Virus (HTLV) I and II.

Almost half (45.8%) of the respondents had rational attitude towards PEP. However they had the misconception that adverse effects caused by antiretroviral regimens used were irreversible.

Only 14.7% of the previously exposed respondents reported that they had utilised PEP services that is, had sought professional attention. There was need to increase awareness of occupational HIV transmission and the available options for PEP so that a more rational attitude towards PEP is developed. Improving HCW education, information and communication would bridge the knowledge-practice gap and achieve this.

An urgent need for the government to formulate and enforce through appropriate strategies, a policy on HIV-PEP for public health institutions has become

evident. This calls for a multidisciplinary expert consultation to put together feasible suggestions and assess the most appropriate implementation process.

CHAPTER 1: INTRODUCTION

In 1981, the *New York Times* published an article about a syndrome that would later be known as AIDS (Acquired Immune Deficiency Syndrome). HIV/AIDS has since become a serious public health and development problem in the world, Africa being the hardest hit. (Harvard AIDS review, 2000). In just a generation, HIV has transformed our world. The virus has moved quickly and stealthily weaving itself into the Deoxyribonucleic Acid (DNA) of millions of people, weakening the threads of society, challenging the fabric of our very humanity.

The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that 21.8 million people around the world have already died of AIDS, of whom 2.5 million died in the year 2002. In addition, another 42 million people are currently infected with HIV, the virus that causes AIDS (UNAIDS/WHO, 2003). Some 4.2 million adults, half of whom were women became infected in the year 2002. More than 95% of people living with AIDS are in low-income countries and 70% of them in Sub-Saharan Africa most of whom are women and children (UNAIDS/WHO, 2002). Similarly, many Kenyans are infected with HIV. For every eight adults aged 15-49 in rural Kenya, one is infected. Moreover, in urban areas, a fifth of all sexually active adults are infected, most of them unaware of this fact (NASCOP, 2001). More than 1.5 million people have already developed AIDS since the first case was described in Kenya in 1984, of which 250,000 have

died. Due to underreporting and under diagnosis the reported cases only reflect a proportion of the true problem (NASCOP, 2001). It is estimated that about 2.2 million people are currently infected with HIV in Kenya including 100,000 children (NASCOP, 2001). This means that there are about 470,000 HIV-infected adults in urban areas. The National prevalence is 14%, and 17-18% in urban areas, and still the infection levels exceeds 20% of all adults in Busia, Kisumu, Meru, Nakuru and Thika. In Nairobi and Mombasa, 15% of adults are HIV positive. Seventy two percent (≈ 1.5 million) of infected adults live in rural areas. The trend in prevalence suggests that there will be a rise of up to about 15% by the year 2005, nationally (NASCOP, 2001).

The growing epidemic has become a slow harvester of lives, undoing decades of development and causing tremendous loss of investment in the world's most valuable resource- human capital, through illness and premature deaths (Anderson, 2000; UNAIDS/ WHO, 2002). On average, 3 people in Kenya die every six minutes because of AIDS (NASCOP 2002). About 80% of these are aged 15-49 years and are principally the most economically productive people with vital social and economic roles in their communities and societies. (UNAIDS/WHO, 2000; UNAIDS/ WHO, 2002). The economic loss incurred by the country is close to Shs210 million daily. Adult and child mortality has risen so rapidly that global life expectancy has dropped by about 10-17 years. (Morin & Chesney, 2000). Average life expectancy in Sub-Saharan Africa now is 47

years, compared to 62 years without AIDS (UNAIDS/WHO, 2002). In Kenya, the Central Bureau of Statistics reported that 15 years of life have been lost (NASCOP, 1999). Reduction in life expectancy means that health institutions will have less time to realize the gains from their investment in training new workers (Hancock & Nalo, 1996). Sickness and death due to AIDS among HCWs is growing rapidly but few countries have yet understood the epidemic's impact on human resources in their health sectors. As in other sectors of the economy, increasing rates of HIV infection in HCWs will increase rates of absenteeism, declined labour productivity, cause reduction in the size and experience of the labour force, and lead to higher levels of spending for treatment, death benefits, additional staff recruitment and training of new health personnel. Generally, there is enormous loss of skills and organizational memory, forcing costs up and driving productivity down (UNAIDS/ WHO, 2002). A study in Zambia showed that in one hospital, deaths in HCWs increased 13-fold over the 10-year period from 1980-1990, largely because of HIV (UNAIDS/ WHO, 2000). Everything must therefore be done to protect the HCWs, who are at risk of exposure to blood borne diseases. This directive does not necessarily place new requirements on employers, but it does recognize and emphasize the advances made in medical technology. It reminds them that they must use readily available technology in their safety and health programs (OSHA, 2003). Occupational Safety & Health Administration U.S. Department of Labour (OSHA) recommends that there be an annual review of exposure control plans so that the employers ensure that their

plans reflect consideration and use of commercially available safer medical devices.

A study in Kenya estimated a hospital bed occupancy at the rate of 30-50% in badly affected areas such as Nairobi and Mombasa, and up to around 70% in Busia and Kisumu (Ngugi, 1995). By the year 2000 about half of all beds were required for AIDS patients. As infection rates increase and more people become ill, AIDS patients overwhelm limited public facilities, greatly undermining normal operations. The risk of accidental exposure to the virus among HCWs also continues to increase because of the heavy workload (UNAIDS/WHO, 2000). Subsequently, the evaluation of simple prophylactic and therapeutic intervention for HCWs who are frequently exposed to HIV may be a viable solution to minimize the risk of acquiring HIV infection from the workplace.

CHAPTER 2: LITERATURE REVIEW

2.1 RISK OF OCCUPATIONAL HIV INFECTION

Risk is defined as a product of ***Hazard*** and ***Outrage*** (perceived concern, outcry, demand for change). When the outrage concerning an event is high, even when the hazard is low, activities associated with the event are believed to be risky. Alternatively, even when the hazard has been quantified to be real, the risk is construed to be low if the event is perceived to be acceptable. For example, despite significant hazard of Hepatitis B virus neeedlestick exposure (it is about 3 in 10), with sequelae ranging from unapparent infection to cirrhosis of the liver to death, the perceived low risk has deterred many HCWs from receiving HBV vaccine, which results in excellent immunity. In contrast, the concern for HIV infection from occupational exposure has been high due to the perceived seriousness of the consequences and the stigma attached to it (Gerald & Richard, 1992; May & Brewer, 2001).

2.1.1 THE HEALTH BELIEF MODEL

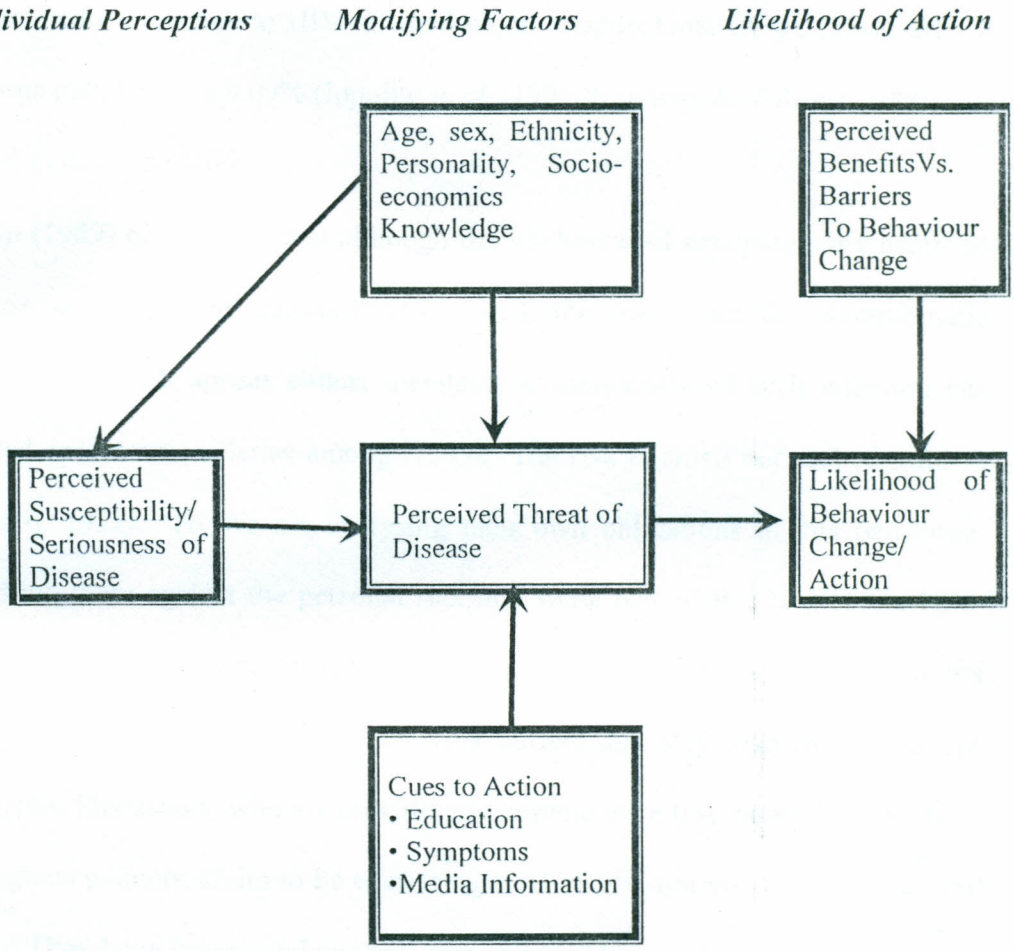
This model was formulated in the 1950s, and was based on experience with public participation in a screening program for tuberculosis (Hochbaum, 1958). Analysis of the various forces and factors that influenced participation resulted in the development of the model (Figure1). The HBM is based on three essential factors: (1) the readiness of the individual to consider behaviour change or adoption of

new practices to avoid disease or to minimize health risks; (2) the existence and power of forces in the individual's environment that urge change and make it possible i.e. institutional policy enforcing mechanisms; and (3) the behaviours themselves, in this case, proper application of UPs and appropriate use of PEP services. Each of these factors is influenced by a complex set of forces that relate to the personality and environment of the individual, as well as past experiences with health services and providers.

The readiness of the individual is influenced by forces that include perception of vulnerability to disease, potency of the threat, motivation for reducing vulnerability, and extent of the belief that behaviour change will be beneficial. If HCWs perceive following UPs and use of PEP services to be beneficial to them in reduction of risk of occupational HIV transmission, then they will more readily adopt these practices. Forces that influence behaviour change are themselves influenced by the personal characteristics of the individual, the appraisal by the individual of the extent of the changes proposed, the effect of interactions with the health professionals recommending change, and previous experiences with similar attempts at behaviour change. This may imply that HCWs will consider their past experiences with PEP providers or those of their colleagues and decide whether to access them in future. This is where matters of confidentiality, empathy, proper follow-up and information must be considered as integral parts of PEP service provision. The HBM provides an outline of the essential factors involved in

behaviour change, and acts as a guide to careful exploration of the personality and environment of the target population, individual or group.

Figure 1: Components of the Health Belief Model



(Adapted from Rosenstock, I.M.: Historical Origins of the Health Belief Model. In: The Health Belief Model and Personal Health Behaviour. Edited by M. H. Becker. Thorofare, N.J, Charles B. Slack, 1974).

Epidemiological surveillance of HCWs since the onset of AIDS suggests 3 mechanisms of occupational infection: percutaneous inoculation of blood by needle stick or puncture wound, blood contamination of non-intact skin, and mucous membrane exposure through splashes (Philip, 1989). Prospective studies on HCWs have estimated that the average risk of HIV transmission after a percutaneous exposure to HIV-infected blood is approximately 0.3% and after a mucous membrane is 0.09% (Ippolito *et al.,* 1993, Kennedy & William, 2000).

Philip (1989) emphasizes that although the likelihood of occupationally acquired disease appears to be extraordinarily small, the realization that symptomatic disease and death appear almost inevitable consequences of such infection has created enormous anxieties among HCWs .The risk is small but real (Gerald & Richard, 1992). HCWs are analysing their own obligations in this pandemic, weighing them against the personal risk that some fear of the care of the HIV-infected patients necessarily entails. This fear takes a heavy toll. When HCWs worry constantly about AIDS, their work suffers and they lose enthusiasm for their jobs. Physicians, who are unwilling to assume even tiny risks of exposure to contagious patients, claim to be exercising civil liberty, not violating the patients' rights. They have interpreted medical care as a *'public good'* to mean that it is the duty of the state and not the individual practitioner to provide it thus excluding the question of personal responsibility to provide medical services (Zuger & Miles, 1987). This moral versus scientific dilemma has not been clearly resolved but

constitutes an important component of the success or failure of present-day prevention efforts (Gene & Churchill, 1994). These facts should not be underrated because so far there is currently no verified vaccine against HIV. Again the seemingly small risk may be aggravated by various factors such as the frequency to exposure to contaminated instruments and materials, the prevalence of HIV infection in the population, the extent of the injury to the HCW and the infectivity of the source patient (Jost, 1998). There is evidence that the risk of HIV transmission for exposures involving increased volume of blood (deep injury, injury with a device visibly contaminated with source patient's blood and a procedure involving a needle placed in the source patient's vein or artery) exceeds the average risk of 0.3% (Cardo *et al.*, 1997: Kennedy & William, 2000). Another study carried out in Denmark in 1997-1998 revealed that the frequency of occupational exposure to HIV was unacceptably high (Madsen *et al.*, 1999). In caring for HIV patients, HCWs expose themselves to risk over and above that faced by the general population —the risk is cumulative due to repeat incidents (Gilks & Wilkinson, 1998; UNAIDS/WHO, 1998). Several factors render the HCWs working in developing (low- income) countries particularly vulnerable to nosocomial HIV infection. First, the prevalence of infection among the patients they care for is still alarmingly high. Secondly, the HCWs are often relatively inexperienced as their technical skills may not be well practiced and hence they are likely to be exposed to blood and other fluids. Thirdly, many developing countries with a high prevalence of HIV lack the resources to implement universal

precautions adequately. Finally, poor or inadequate equipment and facilities are more often encountered in these countries and can increase the risk of exposure (Gilks & Wilkinson, 1998). Indeed, given this relative importance of prevention, each exposure to HIV infected blood should therefore be considered a medical emergency (Most, 1998; Richard *et al.*, 2000).

So far, there have been 37 documented cases of occupational HIV transmissions and an additional 78 possible transmission have been reported. Hans (1991) reported 33 cases of HCWs who had contracted HIV infection as a result of occupational exposure. By the end of 1995, 144 cases of HIV infection assumed to be occupational and 79 documented seroconversions had been reported in the industrialized countries most of which occurred in nurses (47%) and laboratory technicians (22%) (UNAIDS/WHO, 1998).

2.2 RATIONAL USE OF PEP

Post exposure prophylaxis (PEP) refers to the use of antiretroviral drugs within hours of exposure to HIV in an attempt to avoid infection. It is aimed at achieving undetectable viral loads, or reducing viral replication to the lowest possible levels (CDC, 1995). Halting viral replication allows host immune defences to eliminate the virus (Wang *et al.*, 2000). Current research suggests that systemic viral dissemination does not occur immediately, which means that post-exposure anti-retroviral medication might be beneficial (May & Brewer, 2001).

Recommendations for use of PEP are based on the risk of local prevalence and on the likelihood of transmission. In the light of the severe consequence of HIV infection, PEP after occupational exposure should be used. In a retrospective case-control study sponsored by the Centres for Disease Control and Prevention (CDC), Zidovudine (AZT) PEP was associated with a 79% to 81% (tenfold) reduction in the risk of seroconversion in exposed HCWs (CDC, 1998), and has become part of the standard prophylactic therapy for people with occupational exposure (Perlmutter & Harris, 1997;CDC, 1998; Cuny & Carpenter, 1998; Bamberger *et al.*, 1999). Based upon this impressive evidence and other data that indicate the efficiency of PEP, PEP has become a standard procedure in the health care settings after significant exposure (Torbatti & Guss, 1999).

Use of PEP however only makes sense if ***Universal Precautions*** (prevention of occupationally acquired infections) as outlined by CDC are widely practiced so that the chances of exposure are minimized (CDC, 1988). Universal Precautions as prescribed by CDC refer to and include:

a) Use of gloves when touching blood and body fluids, mucous membranes and non-intact skin and soiled surfaces and items, and when performing venepuncture. Gloves must be changed after contact with each patient.

b) Use of masks and eye protection in procedures that may generate splashes or aerosols.

c) Use of plastic aprons or gowns when splashing is anticipated.

d) Careful hand washing if hands are contaminated with blood or body fluids.

e) Immediate and thorough hand washing if they become contaminated with blood or body fluids.

f) Extraordinary care in handling needles and other sharps and proper disposal in leak proof containers. Needles or other sharp objects must never be bent, broken or recapped. The puncture resistant containers placed as close as possible to areas of use.

g) Availability of emergency resuscitation devices to minimize need for emergency mouth-mouth resuscitation.

h) Exclusion from patient care to personnel with exudative lesions or weeping dermatitis until these conditions are resolved.

i) During invasive procedures, if a glove is torn or other injury from a used sharp occurs, the glove should be replaced with a new one as soon as possible. The needle or instrument involved in the incident should be removed from the sterile field.

j) All blood and body fluids specimens in should be placed sturdy containers with a secure lid. The outside of the container must never be contaminated.

PEP should be used judiciously and only in the context of a comprehensive prevention and counselling program, due to the impact it may have on the frequency of high-risk behaviour and anti-retroviral drug resistance especially in

cities with high HIV prevalence (Bamberger *et al.*, 1999; Gerberding *et al.*, 1999). The ultimate goal for any HIV prevention strategy whether in the health care settings or in the community should be the prevention of primary exposure (Most, 1998; Gerberding & Katz, 1999). The public health message must emphasize that PEP is no substitute for other prevention methods; it is only a backup for the overall health promotion approach (Katz & Gerberding, 1998; UNAIDS, 2001). It should also be noted that PEP must not divert resources from other HIV prevention strategies such as control of sexually transmitted infections and promotion of safer sex, the treatment of opportunistic infections and research to develop preventive tools like vaccines and microbicides. Neither should it divert resources from other public health programs (UNAIDS/WHO, 1998; Lert, 2000). Despite compliance with adequate precautions, it is not always possible to avoid injuries since engineering and other workplace practice controls are inadequate to protect the HCWs who routinely come into contact with blood and other potentially contaminated body fluids (L' Ecuyer & Fraser., 1997; UNAIDS, 2001). This fact has made intervention desirable after such exposure.

2.3 ANTIRETROVIRAL (ARV) DRUGS USED FOR PEP

The attack of HIV on the immune system can be altered with combination(s) of anti-retroviral agents that interrupt the HIV reproductive cycle (Figure 2), by targeting enzymes that are important for RNA replication and viral functioning

(UNAIDS/WHO, 1998,1999; Rachlis, 1998; Porche, 1999;). Antiretroviral treatment reduces the ability of the virus to replicate, allowing the intact immune system an opportunity to clear the virus and thereby reduce the risk of seroconversion (Duff *et al.*, 1999). There are currently two major classes of approved antiretroviral agents, which are shown in Table 1 and include:

a) **Inhibitors of transcription**

i) Nucleoside analogue reverse transcriptase inhibitors **(NRTIs)** inhibit the enzyme *reverse transcriptase.* The triphosphate forms of these NRTIs resemble viral nucleotides and are therefore incorporated into growing DNA instead of the viral nucleotides. Chain termination and prevention of any further steps in the viral replication process results.

ii) Non-nucleoside reverse transcriptase inhibitors (**NNRTIs**) also target the enzyme *reverse transcriptase*, binding directly to the enzyme and blocking it from functioning.

b) **Inhibitors of viral assembly**

HIV *protease* enzyme catalyses the cleavage of large polyproteins into structural proteins and viral enzymes in the final stage of the formation of new virions. This class of drugs targets the enzyme *protease* and is known as protease inhibitors (**PIs**) (Porche, 1999; UNAIDS, 1997).

A third class, integrase inhibitors, is under development.

Figure 2: HIV Reproductive Cycle

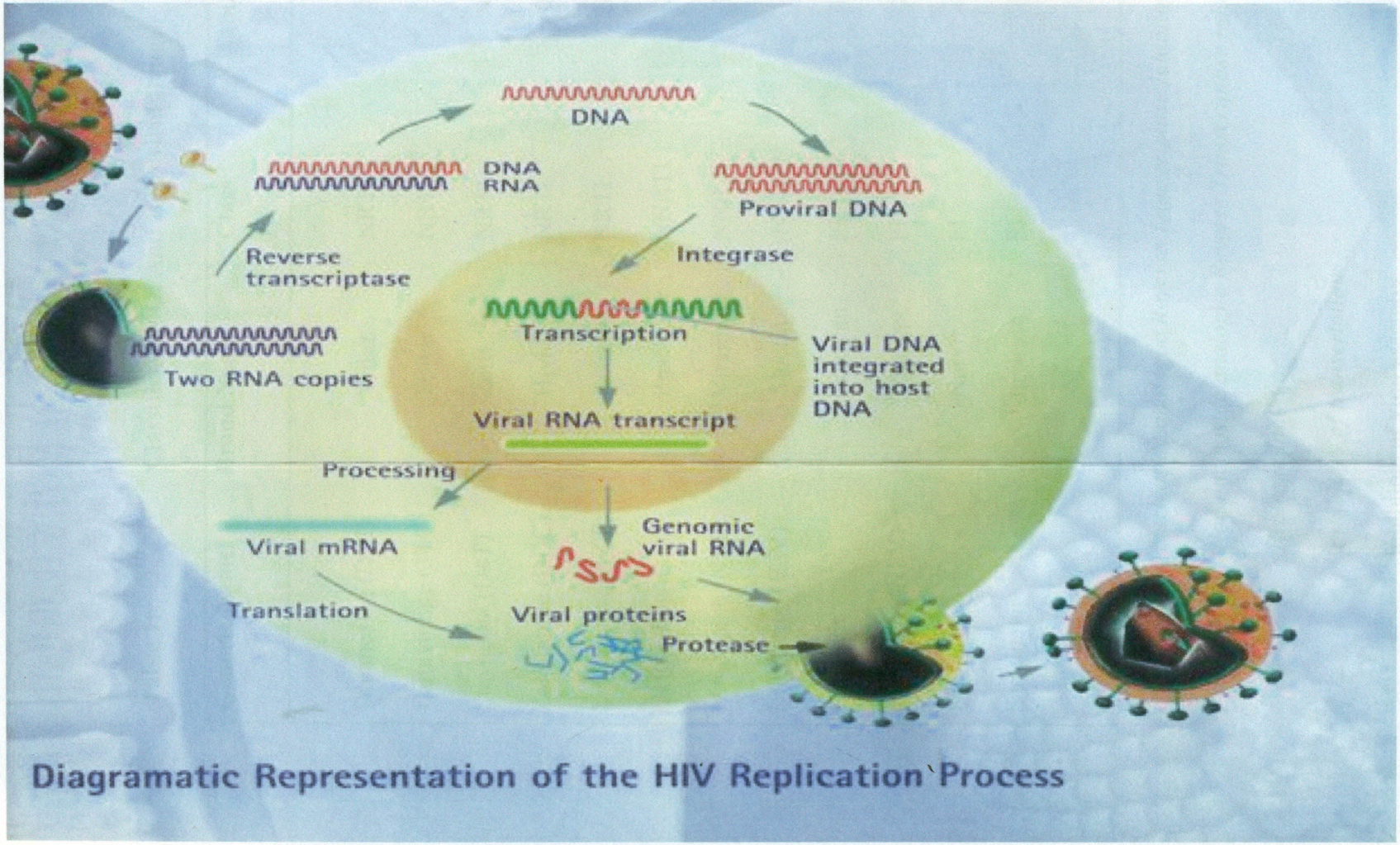


Table 1: Classification Of Anti Retroviral Drugs

Generic Name	Brand Name	Class	Unit Dose
Didanosine (DDI)	Videx	NRTI	100mg
Lamivudine (3TC)	Epivir	NRTI	150mg
Stavudine (D4T)	Zerit	NRTI	40mg
Zalcitabine (DDC)	Hivid	NRTI	0.75mg
Zidovudine (AZT)	Retrovir	NRTI	100mg
Delivirdine	Rescriptor	NNRTI	100mg
Nevirapine (NVP)	Viramune	NNRTI	100mg
Efirvirenz (EFV)	Stocrin	NNRTI	
Indinavir	Crixivan	PI	800mg
Nelfinavir (NFV)	Viracept	PI	250mg
Ritonavir	Norvir	PI	600mg
Saquinavir	Invirase	PI	600mg

**NRTI* = *Nucleoside analogue Reverse Transcriptase Inhibitors*

**NRRTI* = *Non nucleoside analogue Reverse Transcriptase Inhibitors*

***PI* = *Protease Inhibitor*

* = ***inhibitors of transcription***

** = inhibitors of viral assemby

2.4 RATIONALE FOR COMBINATION THERAPY

The objective of anti-retroviral therapy is to enable HIV- infected individuals to live a life of normal length and quality. This can only be achieved through profound suppression of viral replication, as the extremely high rates of replication are the driving force behind viral diversification and emergence of variants. The degree and sustainability of ARV required to suppress the virus is unlikely to be achieved with monotherapy. Profound and prolonged suppression of viral loads to undetectable levels (below 200 RNA copies per millilitre of blood) (UNAIDS, 2001).

Current CDC guidelines suggest that the front line therapy of occupational exposures should include AZT and 3TC with or without a protease inhibitor, but may need to be individualized if the patient is drug-experienced. The current study suggests that resistance is common, so that often post exposure prophylaxis will need to use combinations of D4T with either 3TC or DDI, i.e. drugs that are different from what the source patient was taking (Kessler, 1999).

Combination therapy for PEP with drugs from different classes is more effective than monotherapy in slowing down disease progression and improving survival. That is, an increase in life expectancy and an improvement of quality of life (Jet & Lange, 1997; Puro & Ippolito, 1997; KANCO, 1999; UNAIDS/WHO, 1999).

This is because different ARVs fight the virus at different stages of its reproductive life cycle resulting in an increase in effectiveness. However, in extreme cases of poverty in the developing countries where ARVs are not widely used and the source patients are therefore ARV – naïve, WHO has recommends AZT monotherapy as a valid option (UNAIDS/WHO, 1998).

Cost-effectiveness estimations for PEP have been made in developed countries. The cost per case of HIV averted is very high (Pinkerton, 1997; Pinkerton *et al.*, 2000). Even where such studies have not been done protection of workers in way beyond the economic argument.

2.5 RATIONALE FOR PEP SERVICES AND EARLY TREATMENT

(a) Animal trials suggest that anti-retroviral therapy may be effective in preventing infections if administered within few hours of exposure (UNAIDS, 1997).

(b) There is evidence that Zidovudine (AZT) given to HIV positive mothers and their newborn children can prevent mother-child transmission (UNAIDS, 1997).

(c) Both toxicity and the risk of developing drug resistance in the context of PEP are low. Generally, side effects from HIV PEP may be irritating but are not a serious health threat, especially with AZT and 3TC (Finger, 2001).

2.6 RECOMMENDATIONS FOR THE MANAGEMENT OF POTENTIALLY EXPOSED HCWS

A system for prompt reporting, timely evaluation and management of exposed HCWs and for consultation with experts in the treatment of HIV when using PEP must be available 24 hours a day. This calls for high professional skills and service organization (CDC, 1987) and is the responsibility of the employer. Providers of PEP must be licensed health professionals who are specially trained in matters of confidentiality and in communication skills. All phases of medical management and counselling must ensure that the confidentiality of the worker's and patient's medical data is protected. This is because workers in areas of high seroprevalence may be reluctant to disclose occupational exposures for fear of stigmatisation and as a result of denial against possible infection (May & Brewer, 2001). Exposure and treatment for other blood borne pathogens, e.g. Hepatitis B Virus, should also be considered.

2.6.1 First Aid treatment

It must begin as soon as possible after exposure. If the health care worker is involved in patient care at the time of the incident, the patient's safety must also be considered. Procedures for proper wound care should be followed: - thorough washing of the affected area and encouraging bleeding without sucking or immersing in bleach (Longmore *et al,* 2001).

2.6.2 Source individual

Once an exposure has occurred, testing for HIV antibody of the source individual whose blood or body fluids were implicated should be considered. It is important that informed consent be obtained and local laws regarding this consent must be followed. Policies should be available for testing source individuals in situations where consent cannot be obtained (e.g., an unconscious patient) It is extremely important that tests be carried out at a location where appropriate pre-test counseling is available; post-test counseling and referral for treatment should be provided (CDC, 1998).

2.6.3 Exposed worker

For any exposure to a source individual who is infected or whose serostatus is unknown or is found to be positive for HIV or who refuses testing, the worker should receive follow-up counselling regarding the risk of infection and evaluated clinically and serologically (after appropriate counselling and informed consent) for evidence of HIV infection as soon as possible after the exposure (CDC, 1996). In view of the evolving nature of HIV post exposure management, the service provider should be well informed about the current guidelines on this subject. The worker should be advised to report and seek medical evaluation for any acute febrile illness that occurs within 12 weeks after the exposure. If an illness, particularly characterized by fever, rash, or lymphadenopathy, may be indicative of recent HIV infection. Protocols should be developed for obtaining informed

consent before serologic testing. Following the initial test at the time of exposure, seronegative workers should be retested periodically after 6 weeks, 12 weeks, and 6 months to determine whether transmission occurred. During this follow-up period (especially the first 6-12 weeks after exposure in which most infected persons are expected to seroconvert), exposed workers should follow the recommendations for preventing secondary transmission. These include refraining from blood donation and using appropriate protection during sexual intercourse (CDC, 1990; CDC, 1999). Worker confidentiality is a vital consideration during all follow-up visits.

Where source patient was tested and found to be seronegative, baseline testing of the exposed worker with follow-up testing 12 weeks later should be performed if desired by the worker or recommended by the service provider. Where the source patient cannot be identified, decisions regarding appropriate follow-up should be individualized. The employer should make serologic testing available to the workers who may be concerned they have been infected with HIV through an occupational exposure. Post exposure prophylaxis should be considered and based upon current medical knowledge and practices.

2.6.4 Documentation of exposures and reporting

Written records should be made of all potential exposures. As part of the confidential medical record, the circumstances of exposure should be recorded.

Relevant information includes the activity in which the worker was engaged at the time of exposure, the extent to which appropriate work practices and protective equipment were used, and a description of the source of exposure. Reporting systems should be uncomplicated to encourage workers to report exposure incidents. Workers need to be educated about the importance of reporting, documentation by filling in of incidence forms, and follow-up of all exposures to blood and potentially infectious fluids (CDC, 1998).

2.6.5 HIV antibody tests

A person is identified as infected with HIV when a sequence of tests, starting with repeated immunoassays (ELISA) and including a Western Blot or similar, more specific assays are repeatedly reactive. Persons infected with HIV usually develop antibodies against the virus 6-12 weeks after infection (CDC, 1998).

2.6.6 Administration and record keeping

As a first step in determining what work practices and protective equipment should be required, every employer must evaluate all working conditions and the specific tasks that workers are expected to encounter as a consequence of employment. Based on that evaluation, all working conditions should be classified into categories of potential exposure. The employer should maintain a written record of this evaluation.

Within the health-care setting, general infection control procedures that have been developed to minimize acquisition of infection from contact with contaminated devices, objects, or surfaces or of transmission of an infectious agent from health-care workers to patients are applicable. Such procedures also protect the workers from the risk of being infected. General infection control procedures are designed to prevent transmission of a wide range of microbiological agents and to provide a wide margin of safety in the varied situations encountered in the health-care environment, and by emergency and public-safety workers.

Whenever feasible, job design/ engineering controls should be used to achieve a maximal reduction of the risk of exposure. Of all the possible risks to health-care workers from exposure to blood borne pathogens, contaminated needles and sharp objects pose the single-most serious risk. The optimal solution is to reduce the use of needles by using alternative methods for performing medical procedures or developing new procedures that require fewer or no needles. This level of technology is expensive and not widely available in developing countries and therefore the option is to use the needles with utmost precaution. Used needles must never be re-sheathed. Where there is absolute necessity to do so, a ***Mushroom / shied device*** (Figure 3), which holds the cap so that the needle can be introduced safely should be used (Shaheen, 2000; Shanson, 1987). Employers should ensure that they adopt the 'Safer Needle Devices" policy to reduce the chances of percutaneous inoculation with potentially infectious products.

Because most personal protective equipment is easily penetrated by needles. Percutaneous exposure has been mainly associated with unsafe needle devices rather than careless handling by HCWs(CDC,1998)All sharps and other clinical wastes must be carefully disposed of to safeguard the environment such for example by incineration, and all reusable equipment thoroughly sterilized before re-use for example by use of autoclaves.

Work practices and standard operating procedures (SOPs) should be developed on the assumption that all body tissues and fluids, to which universal precautions apply, are infectious. Provision must be made for safe removal, handling, and disposal or decontamination of protective clothing and equipment, soiled linen, etc. Work practices and SOPs should provide guidance on procedures to follow in the event of spills or personal exposure to tissues and fluids. These procedures should include not only instructions for personal and area decontamination, as well as post exposure management strategies, but also supervisory personnel to whom the incident should be reported.

In summary PEP should be accessible in localities where clinical, laboratory and social support can be guaranteed and preferably within the first 4 hours after exposure. Since the HIV status of the source patient is not usually known at the time of injury, ARV treatment is started pending the results of HIV testing of the source patient (King *et al.*, 2001). Treatment should continue for at least 4 weeks. Health care institutions must ensure that exposed HCWs and clinicians

counselling them are adequately informed about the risk of HIV transmission and the options available for PEP. They should collect and disseminate information on all aspects of PEP and adopt protocols that reflect best-updated practices. Rigorous surveillance of exposure and unwanted effects of antiretroviral drugs is invariably important (Questel., 1999). CDC (1996) recommends that laboratory investigation be carried out for safe and effective use of PEP as follows:

a) HIV Testing

- Initial serology within 8 days of exposure to rule out prior infection.
- Serology follow-up at 6 weeks, 3 and 6 months to check for possible post-exposure seroconversion.

b) Laboratory monitoring for adverse effects of anti-retroviral drugs (ARVs).

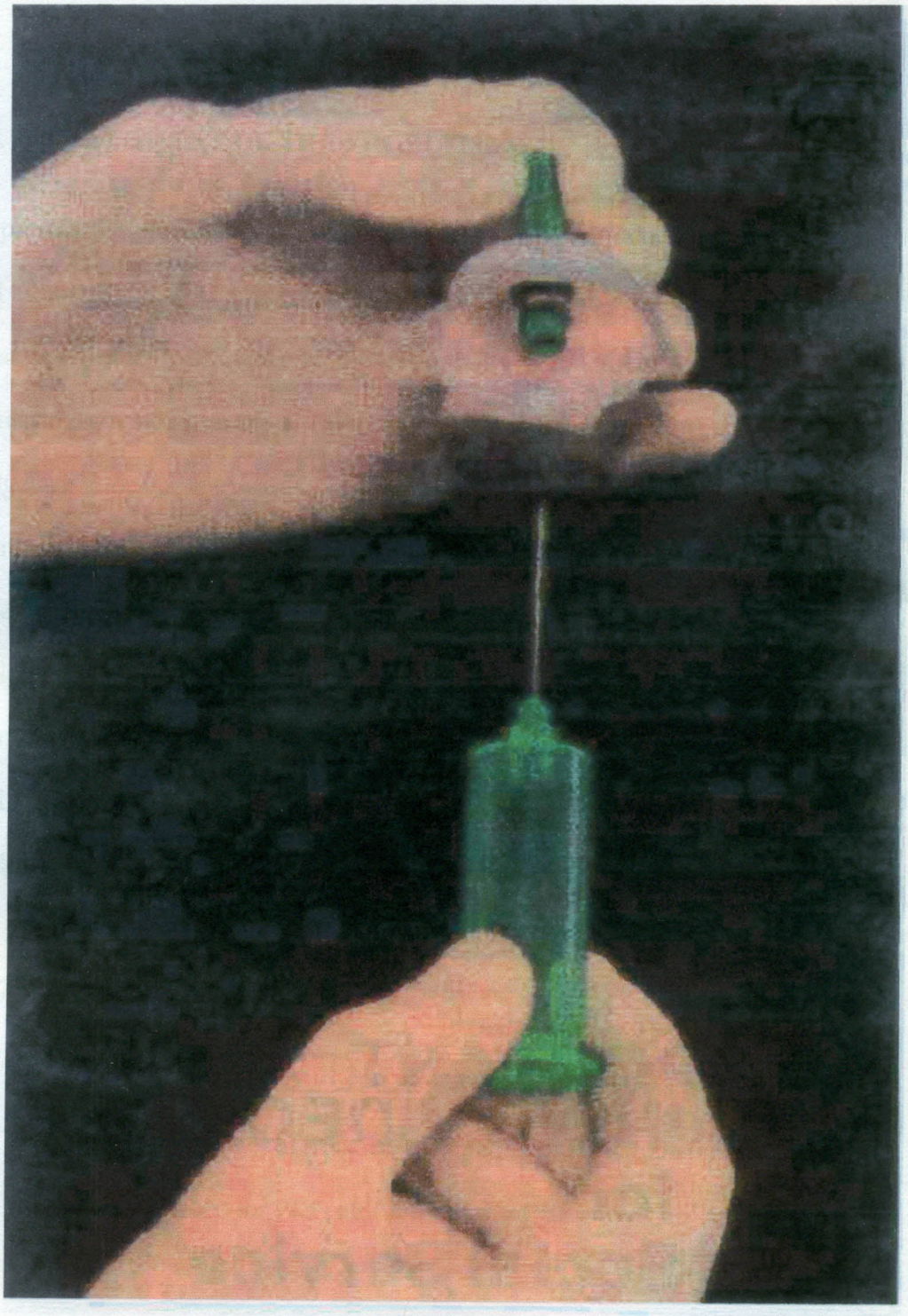
- Liver function Tests (LFTs).
- Blood Counts
- Amylase analysis
- Glucose levels

c) CD4 counts by flow cytometry to determine the progress of probable infection.

d) Viral Load Monitoring

e) Monitoring of resistance to ARVs during treatment.

Figure 3: Mushroom/shield device



2.7 RATIONALE FOR THE STUDY

2.7.1 STATEMENT OF THE PROBLEM

At present the prevalence of HIV/AIDS in Kenya is still alarmingly high (14%), and although previous efforts have been designed to decentralize HIV/AIDS care from the health institutions to the community level, there has been an ever-increasing workload on the already overstretched public facilities. To add to this budgetary allocations towards the health sector had been greatly affected by the country's poor economic performance meaning that health institutions may not have been in a position to provide employees with the necessary protective equipment such as gloves, aprons, masks. PEP services may consequently be significantly under-utilized even where such a specific intervention is clearly justified. The concern is that the utilization of PEP services among HCWs is markedly low, resulting in an increase in the risk of occupational HIV infection.

2.7.2 RESEARCH QUESTIONS

(a) What is the current status of HCWs in health institutions in Nairobi as regards knowledge of risk of occupational HIV transmission and the available options for PEP, attitude towards PEP and its utilization?

(b) How do personal characteristics such as age, professional cadre, gender and experience influence HCWs' knowledge of risk of occupational HIV

transmission and the available options for PEP, attitude towards PEP and the level of its utilization?

(c) How do HCWs in pubic health facilities compare with their counterparts in private health facilities in terms of knowledge of risk of occupational exposure to HIV and available options for PEP, attitude towards PEP and its utilization?

2.7.3 JUSTIFICATION OF THE STUDY

UNAIDS/WHO (1998) documents that data on frequency and risk factors for percutaneous exposure to blood in the health care system in developing countries are limited. Most of the current epidemiological data come from developed countries in which exposure rates are significantly different. In areas of the world where prevalence is known to be high for example, in Sub-Saharan Africa, systems for monitoring and reporting occupational exposure are poorly developed or non-existent. No known previous studies have addressed the issue of occupational HIV exposure and PEP in Kenya. There is high seroprevalence in Kenyan urban populations (UNCB, 2001). The magnitude of occupational risk of HIV infection in our circumstances of high prevalence may be underestimated, overlooked or

even ignored and PEP services consequently under-utilised even where such a specific intervention is clearly justified.

The findings of this study are expected to provide baseline data for future research and create awareness of the risk of occupational HIV infection in HCWs while guiding in addressing the policy gap between existing policies and practices of PEP in the health institutions. It will also guide the Ministry of Health in providing and enforcing a policy for preventing HIV transmission in the health care settings, and provide care and support to those infected at work.

2.7.4 NULL HYPOTHESIS

Institutional and individual HCW differences do not determine the level of knowledge of occupational HIV transmission and the available options for PEP, and the level of utilization of PEP services in hospitals in Nairobi.

2.7.5 OBJECTIVES OF THE STUDY

2.7.5.1 GENERAL OBJECTIVE

To assess the factors that influence the level of utilization of PEP services among the occupationally exposed health care workers in Nairobi, Kenya.

2.7.5.2 SPECIFIC OBJECTIVES

(a) To establish the existence of institutional practice guidelines for the management of HCWs exposed to HIV in hospitals within Nairobi.

(b) To assess the HCWs' level of knowledge on occupational HIV transmission and the available options for PEP.

(c) To examine the attitude of the occupationally at risk HCWs in Nairobi towards PEP.

(d) To determine the level of utilization of PEP services in HIV-exposed HCWs in hospitals in Nairobi.

CHAPTER 3: MATERIALS AND METHODS

3.1 THE STUDY AREA

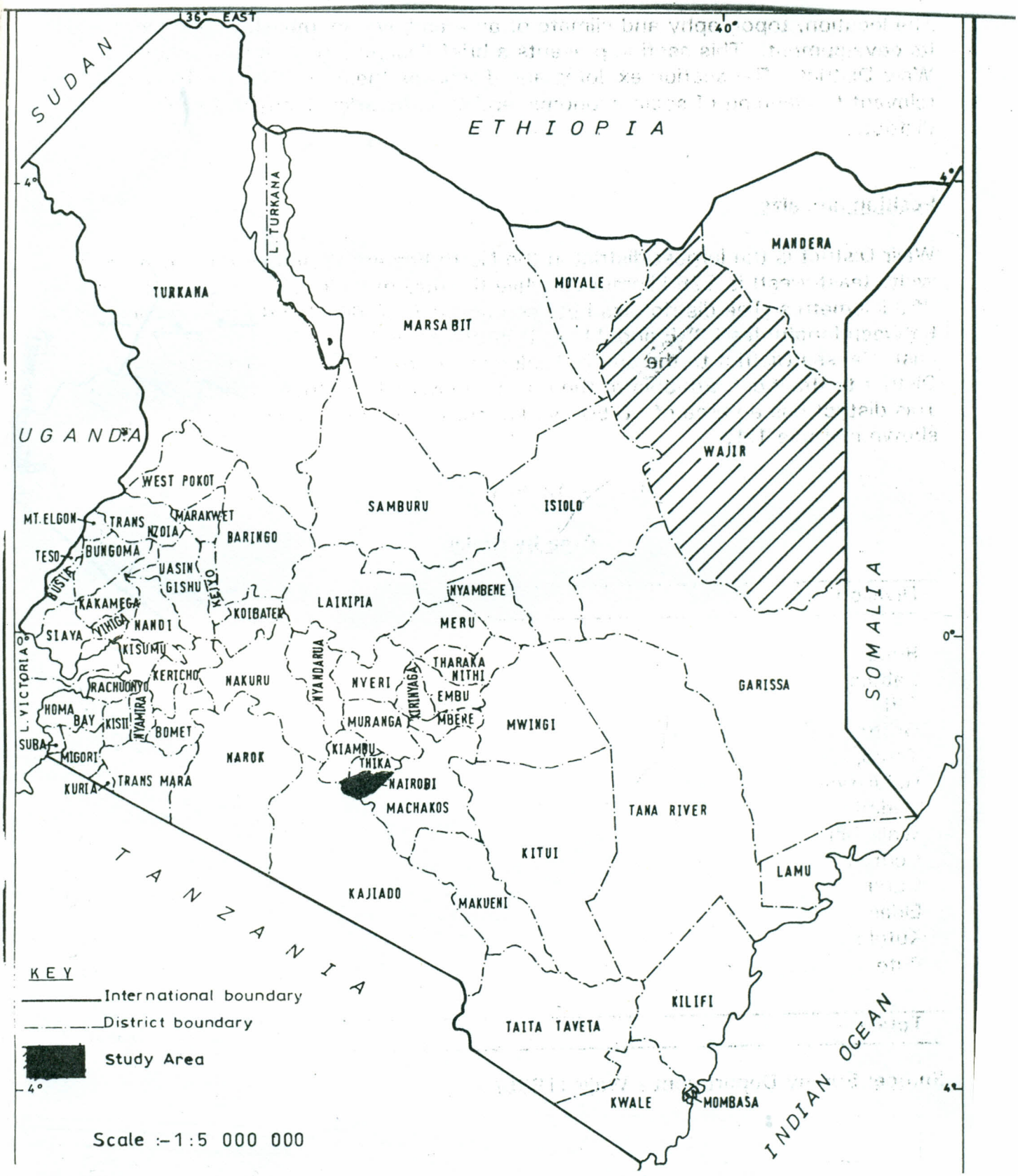
The study was carried out in Nairobi province, which is bordered to the East by the Eastern Province, to the North by the Central Province and to the West and South by the Rift Valley Province. Nairobi province has approximately 300 registered health care institutions of which 47 have in-patient facilities (Figure 4).

3.1.1 REASONS FOR CHOICE OF STUDY AREA

Nairobi province is the home to some of the largest institutions of health in Kenya. Kenyatta National Hospital is the largest national referral hospital in the country receiving patients from all the other institutions that is, private, public, local authorities, mission and NGO sectors.

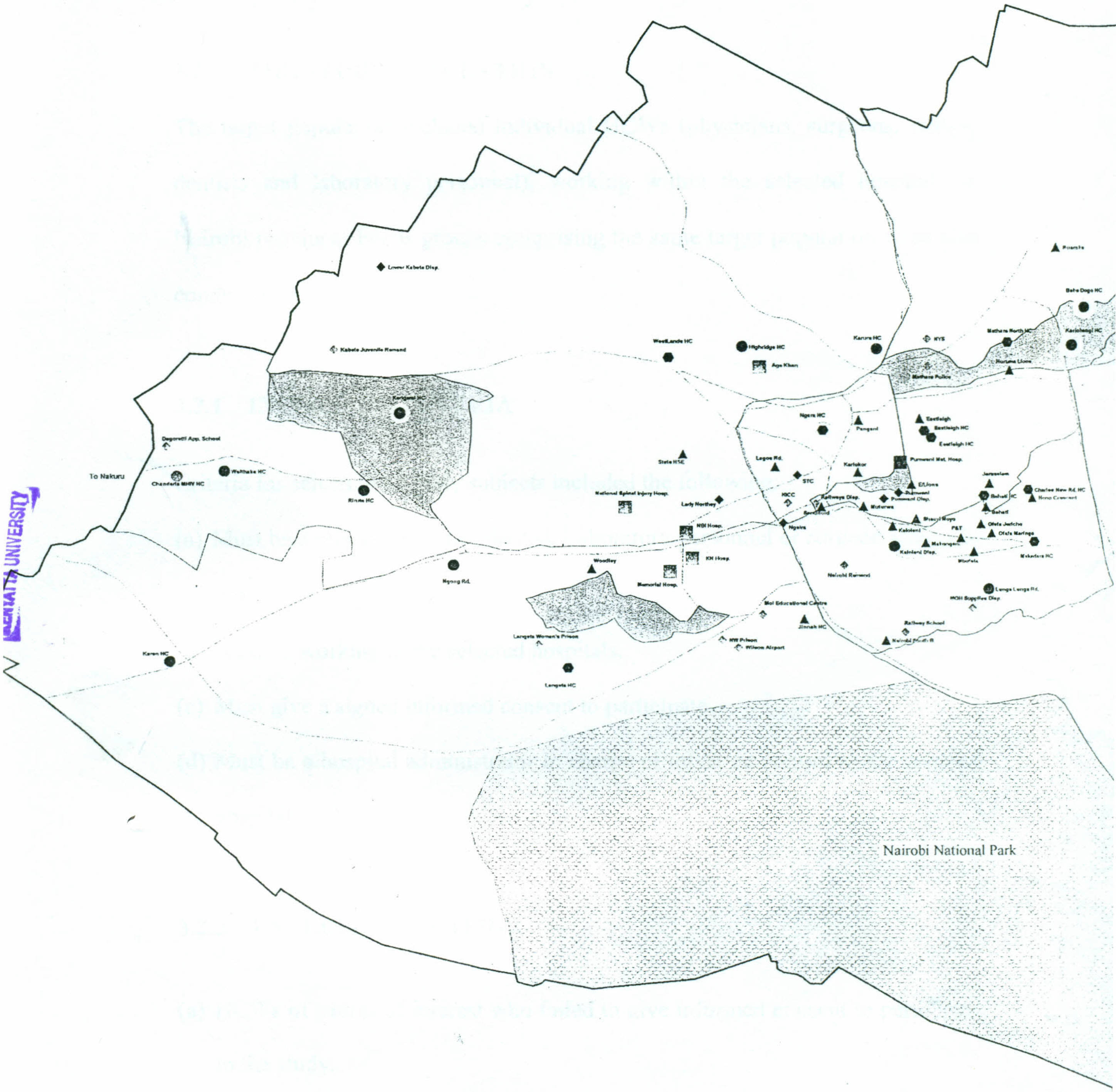
Nairobi has a high seroprevalence (over 15% (NASCOP, 2001)), and being the largest and most densely populated urban area in Kenya, it has a relatively larger number of HCWs than any other town. High demand for health care and very limited facilities result in heavy workload for the HCWs, further exposing them to occupational HIV infection.

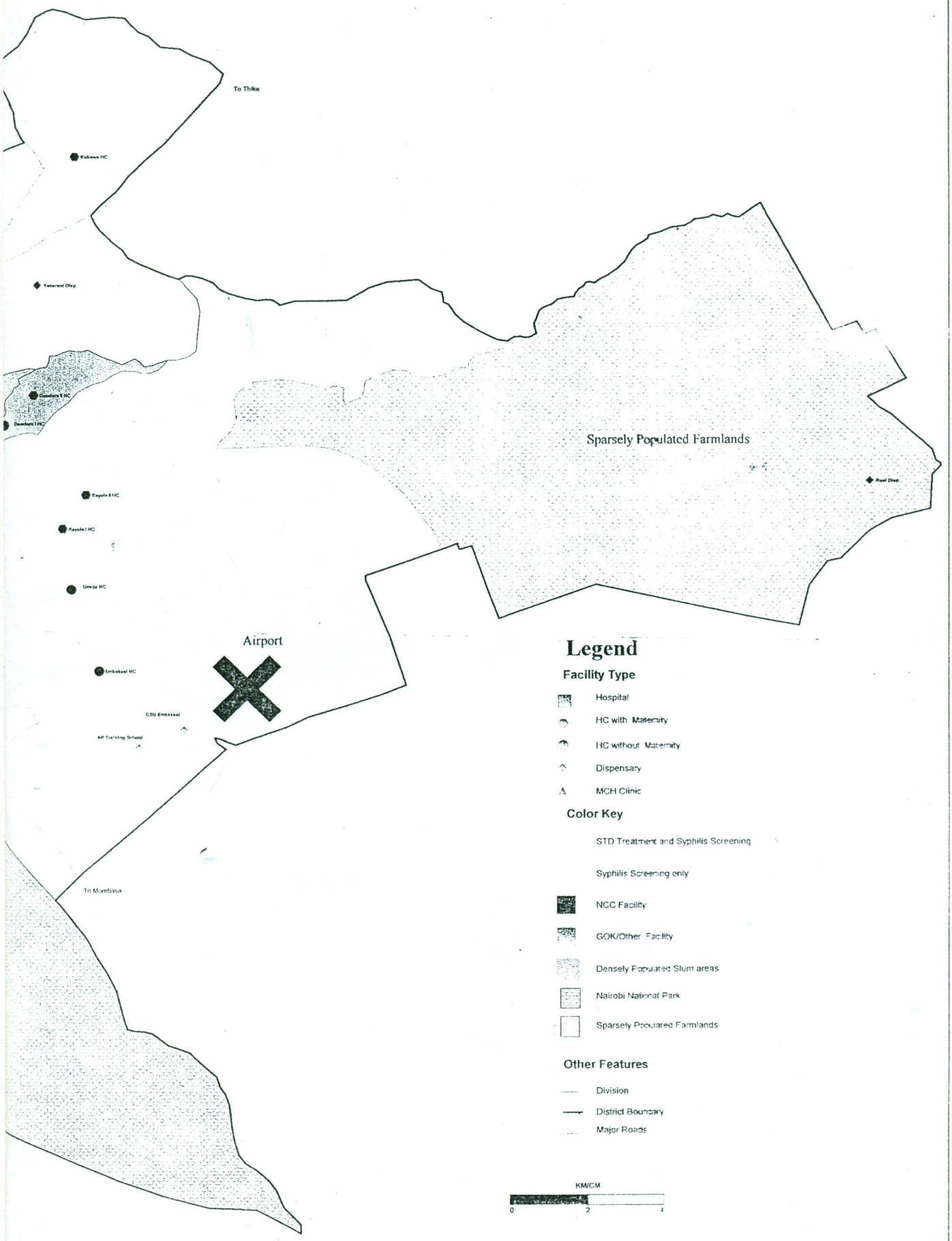
Figure 4: Map of Kenya showing the location of Nairobi Province



Nairobi City

Health Facilities





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1996

Three focus group discussions (FGDs) were conducted (one in each hospital) to strengthen the data obtained from the self-administered questionnaires. The discussants comprised of HCWs of the cadres of interest in each hospital who did not fill in the questionnaires but volunteered to attend the discussions. Attendance was minimal owing to the fact that the HCWs had a busy schedule and heavy workload. Overall, the smallest number for attendance in each cadre for every hospital was maintained at two (2).

3.3.2 SAMPLE SIZE DETERMINATION

The formula previously used by Fisher *et al.*, (1998) was used to determine the minimum sample size i.e.

$$N = \frac{Z^2 P Q D}{d^2}$$

Where: N = Minimum sample size required

Z = Standard normal deviate corresponding to a confidence level of 95% (1.96)

P= Hypothesized proportion of HCWs with adequate knowledge of occupational exposure risks and PEP, rational attitude to PEP = 50%= 0.5)

Q = 1-P

D = Design effect=1

d= Degree of accuracy required = 0.05

$$= \frac{1.96^2 \times 0.5 \times 0.5 \times 1}{0.05^2}$$

$$= 384$$

Since the selected institutions greatly varied in size and number of HCWs, probability proportional to size (PPS), (Fisher *et al.*, 1998) was used to determine the sample size in each institution. The proportion of each cadre of HCW from each institution was determined, as appropriate and purposive sampling employed.

3.4 STUDY DESIGN

This was a descriptive cross-sectional study, which was carried out among health care workers in the study area. The purpose of this kind of study was to provide information on the knowledge of occupational HIV transmission and the available options for PEP, and the level of utilization of PEP services.

3.5 VARIABLES

3.5.1 DEPENDENT VARIABLES

These were related to knowledge of occupational exposure to HIV infection and attitude towards PEP, and the level of utilization of PEP among the health care workers (See Appendix vi).

3.5.2 INDEPENDENT VARIABLES

These included the health sector/ institution of affiliation and the HCWs' personal characteristics such as age, gender, years of experience and profession/cadre.

3.6 RESEARCH INSTRUMENTS

Both qualitative and quantitative techniques of data collection were used in the study. The required data were collected through self-administered questionnaires (Appendix ii) to HCWs in direct care of patients, in depth interviews with the hospital administrators in charge of infection control and hospital pharmacies, using an interview guide (Appendix i) and focus group discussions using a focus group discussion guide (Appendix iii), also comprising HCWs in direct care of patients who had not filled the questionnaires. Participant observation was used to confirm the findings from the two methods above.

a) The Questionnaires

A standardized self-administered questionnaire (Appendix ii) written in English language was used which comprised of both open- and close-ended questions. A total of 179 filled questionnaires were returned. The questionnaires were pre-tested at the Armed Forces Memorial Hospital before the actual study was done and necessary changes discussed and made. A total of 20 HCWs were recruited for this exercise.

b) Focus Group Discussions (FGDs)

A focus group discussion was held in each of the hospitals whereby the principal investigator was the moderator. Two of the research assistants assisted in this exercise where one took note of what was raised during the proceedings while the other acted as an observer as well as a timekeeper. The discussions followed a previously prepared discussion guide (Appendix iii).

c) Participant Observations

This was done through involvement in doctors' and nurses' rounds, working in the wards, attending staff meeting posing as one of the members, and during distribution of questionnaires. The researcher maintained a similar dress code as that of the HCWs in the working areas. This exercise was however limited by the fact that the researcher did not stay in the group long enough to habituate her presence, and to make the group work to go on unconstrained in a spontaneous and natural way. Some HCWs obviously were aware of the researchers' presence

and knew why they were there. This may have provoked behaviours that would not have occurred without the researcher, or would have taken place differently.

3.7 DATA MANAGEMENT

Data collected were first manually edited before being entered into the computer for analysis using the SPSS/PC+ Version10. Cleaning and double-checking of all data was carried out to eliminate possible data entry errors. Analysis was done in three stages: computation of simple frequencies; cross tabulations; and tests of statistical significance "analysis".

Chi-square (X^2) test for significance was applied to identify factors that were related to HCWs' knowledge of associated risks of occupational exposure to HIV infection and PEP, and the level of utilization of PEP. The level of significance chosen for comparison was 5 percent.

3.8 MINIMIZING BIASES AND ERRORS

Purposive sampling seemed to be the most appropriate method of sampling the HCWs because of the nature of their work and heavy workloads.

In preparation for data collection, the research assistants were trained on the study objectives and the actual data collection exercise.

The standardized questionnaire was written in simple English and was pre-tested before being used in actual data collection. Data processing and analysis was done using the SPSS/PC computer software to achieve the desired precision.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 RESULTS

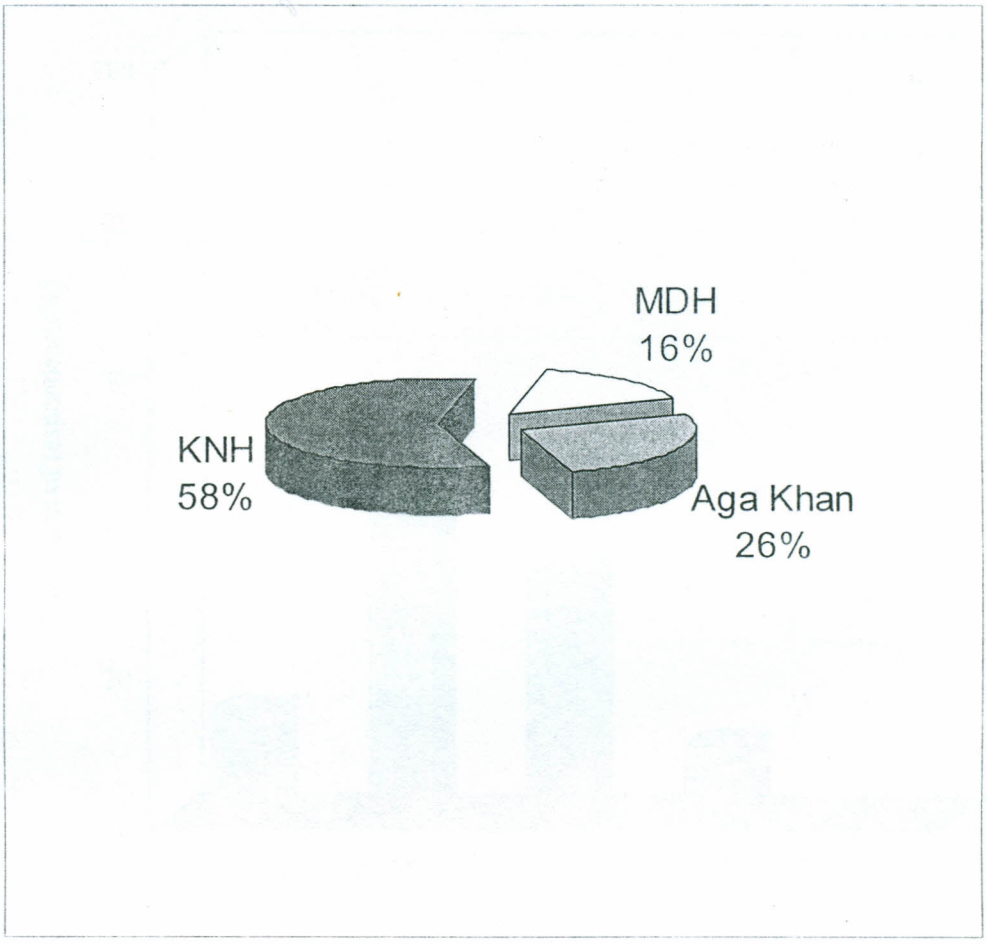
A total of 179 Health Care Workers were available to be included in the study in three health facilities, namely Kenyatta National Hospital (parastatal referral), Mbagathi District Hospital (Government District/Public) and Aga Khan Hospital (private). The majority of the respondents were from KNH. The distribution of the respondents in the various health institutions was relatively proportional to their sizes: KNH 58%, AKH 26% and MDH 16% (Figure 6).

4.1.1 RESPONDENTS' DEMOGRAPHIC CHARACTERISTICS

Out of the 179 respondents 118 (65.9%) were females and 61 (34.1%) were males.

Their ages ranged from 20 years to 64 years with a mean age of 37. The ages of the respondents were distributed as shown in Figure 7.

Figure 6: Distribution of respondents by health institution



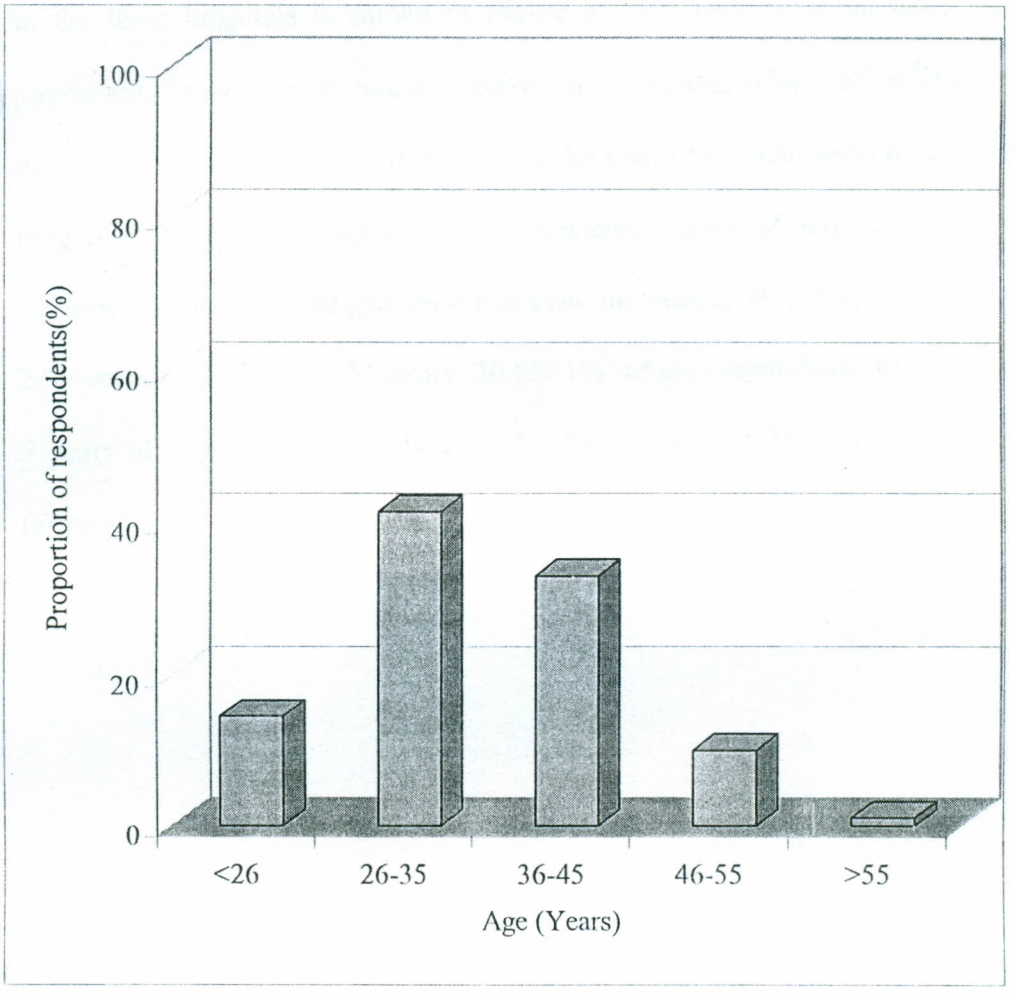
KEY:

KNH = Kenyatta National Hospital

MDH = Mbagathi District Hospital

AKH = Aga Khan Hospital

Figure7: Distribution of the respondents by Age



Majority of the respondents (109) were nurses, 34 were physicians, 17 were laboratory personnel, 11 were surgeons, while 9 were dentists. Their distribution in the three hospitals is shown in Figure 8. The discussants included nurses, physicians, laboratory personnel, dentists and surgeons who availed themselves during their free time, the nurses forming the majority. Their years of experience ranged from 1 to 30 years. The respondents' years of experience in their respective professions ranged from less than one year to 26 years, with a mean of 2.99 years of experience. Majority, 70 (39.1%) of the respondents had between 1-5 years of experience and only 2 (1.1%) had more than 25 years of experience (Figure9).

Figure 8: Distribution of respondents by profession and hospital of affiliation

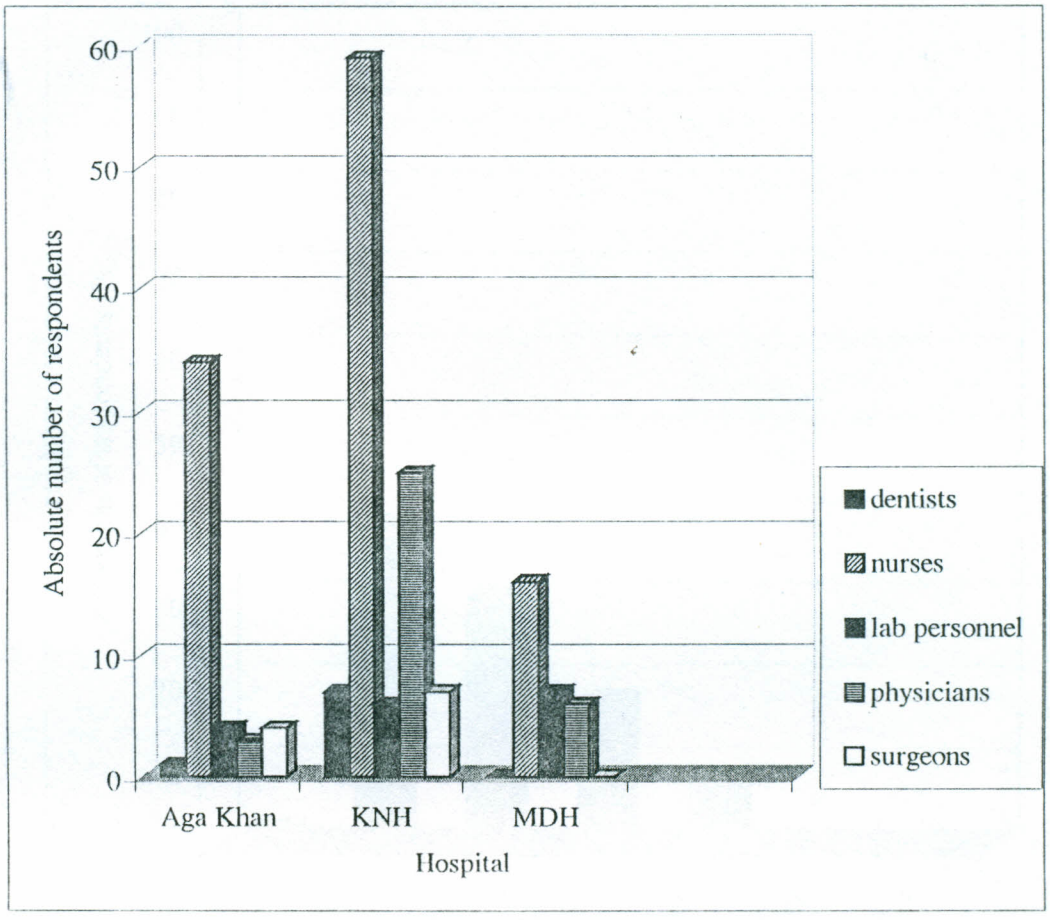
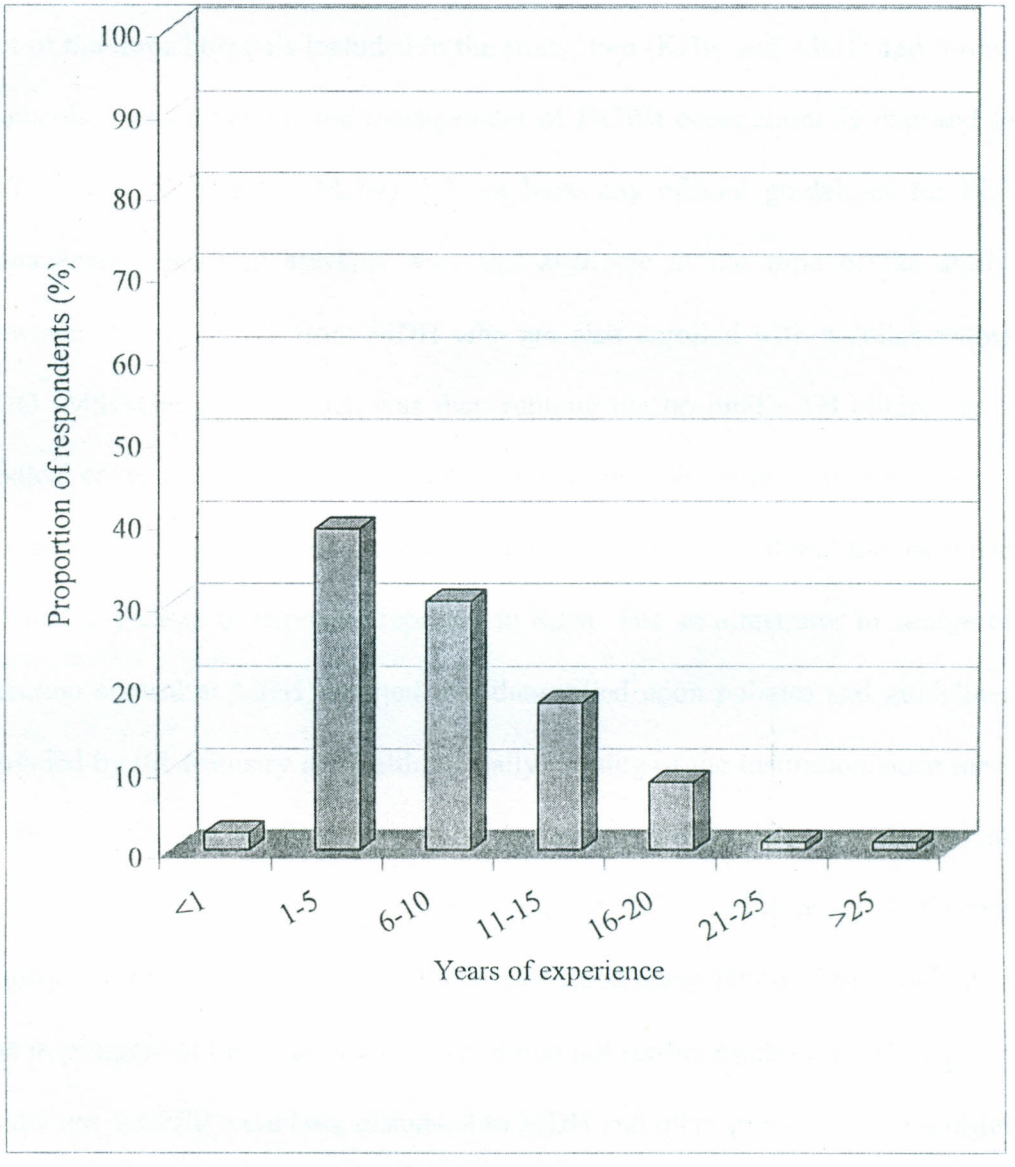


Figure 9: Distribution of Respondents by Years of Experience



4.1.2 AVAILABILITY OF GUIDELINES FOR POST EXPOSURE MANAGEMENT AND ARVS FOR PEP

Out of the three hospitals included in the study, two (KHN and AKH) had formal protocols / guidelines for the management of HCWs occupationally exposed to HIV. The third hospital (MDH) did not have any official guidelines for PEP management and PEP services were not available at the time of the study. However, a few HCWs from MDH who are also enrolled with a collaborating NGO (MSF-Germany), which was then running the hospital's TB clinic, had a medical cover in case of exposure but an interview with the programme manager revealed that the project did not also have any written protocol and that they had not had any cases of exposure reported to them. The administrator in charge of infection control at MDH reported that they relied upon policies and guidelines provided by the Ministry of Health for daily running of the institution since most of their utilities are obtained from there. At the time of this study the Ministry of Health had not given any guidelines regarding PEP to this hospital. Further inquiries from the Ministry of Health revealed that compilation of the guidelines was in progress at the time of the study. It was not further established whether the guidelines for PEP were later disbursed to MDH and other public health facilities in Kenya.

The guidelines in KNH and AKH were both initially adopted from the CDC/WHO and KEMRI recommendations in 1999. Only in AKH had updating of the guidelines been effected (at least twice since they were formulated), through expert consultation in a local panel. At KNH the administrator in charge of infection control reported that there had not been any updating because the infection control committee had been inactive until "very recently."

In Aga Khan Hospital, the guidelines were placed in strategic points where exposure was expected and where they could be accessed by the HCWs (on Notice-boards and on Nurses' desks). On the contrary, in KNH, they were included in a bound booklet (Mboloi et al., 1999). Loose reminder summaries were also established but there was no evidence of them in the clinical areas. The booklet was not readily available to the HCWs as they were expected to acquire it at a fee of Ksh.500.

In KNH the HCWs were being attended to at the staff clinic during the day. At night, PEP services were offered at the General Out Patient Clinic (casualty). The services were being provided by GPs who had not received specialized PEP training. Expert PEP specialists were only consulted in extremely difficult cases. They were said to have been "very busy" clinicians who also had other administrative and clinical duties to perform. In AKH, the situation was as

described above for KNH except that PEP services were being provided at the staff clinic 24 hours a day.

At KNH, the infection control specialist raised concern that not all the HCWs had read the guidelines and therefore not all were informed. This was not the case in AKH where staff education was very active at the time of the study and frequent seminars were held to update the HCWs. There was a hospital policy that members of staff were periodically and randomly appraised on what they had learnt from the seminars. Success in the appraisal meant that the member had more chances of winning the staff-of-the-year award and this was a great motivator for the staff to attend the seminars even during their free time.

Problems associated with provision of PEP services in KNH were those related to poor HCW information, and follow up and reduced awareness of ARV therapy among prescribing doctors. The same problems were reported in AKH although the biggest problem identified here was associated with obtaining consent for HIV testing from the source patients.

4.1.2.1 Record keeping

In KNH, PEP medical records obtained from the staff clinic and from the casualty were being kept at the infection control departmental office, which was being manned by a Registered Nurse who acted as the only link between the infetion control department an the HCWs.

Due to the distances between these three sites and poor co-ordination, records are frequently lost or misplaced. In AKH, the records are kept at the staff clinic after which they are sent to the central registry when follow-up is completed. They are merged with other records regarding the particular HCW where all the important details about his/her health including baseline information at the time of employment can be tracked in a file.

4.1.2.2 Reporting

In both AKH and KNH all incidents of occupational exposure are reported to the in- charge of the area where exposure occurs. A standard HIV exposure incidence form is filled after which the exposed HCW is referred for further investigation and management either to the staff clinic or casualty accordingly.

In KNH a total of 50 occupational exposures had been reported to the infection control unit and documented in the period between January 1999 and September 2001. Forty-one (82%) of these were reported to have been needle stick injuries; mainly from hollow needles and large bore intravenous cannulae and two of them were from solid suture needles. 5 (10%) were from cuts with used surgical blades, one (2%) was from a bite, while 2 (4%) were splashes on face and mouth with potentially infectious fluids (amniotic fluid and lymph node aspirates

respectively). One (2%) HCW was injured by pieces of broken glassware that were visibly contaminated with blood.

Four (8%) of the HCWs who had reported injuries had declined to be evaluated for initial HIV status and were therefore not offered PEP although one of them had had a needle stick injury from a needle used on a confirmed HIV patient. All the other 46 (92%) HCWs, were all evaluated for HIV and only one of them was found to have been HIV positive before exposure. They were all provided with different combinations of ARVs for PEP. One of these however had sought private PEP services at the KEMRI clinic. Only 11 (24%) of those that received PEP had had exposure from confirmed HIV positive sources.

Majority of those who complained of adverse effects included symptoms such as diarrhoea, abdominal discomfort, vomiting, gastrointestinal tract irritation, irritation of the mucous membranes of the mouth, headaches, and general malaise. Records on follow up laboratory and clinical evaluation were not available. It was not established therefore whether they completed the regimen or they discontinued because of the adverse effects.

At AKH, ten (10) reported exposures had been documented during the same period of time. Seven (70%) of these injuries were from needle sticks one of which occurred when a nurse was recapping a used needle. Another injury (10%)

resulted from a cut with a used surgical blade while two (20%) were from splashes on the face from a faulty dialysis machine in the renal unit.

Only one of the source patients was confirmed HIV positive after serology although two of them were confirmed to have HCV and HBV infection respectively. The exposed HCWs had been treated appropriately for these infections.

Records showed that 5 (50%) of the HCWs were given ARVs for PEP, only one of them receiving a two-drug ARV regimen (3TC and AZT). The other four received triple drug regimens including 3TC, AZT and Indinavir. The one HCW, a nurse, who was exposed to blood from a confirmed seropositive source received complete follow up (up to six months) because she had been unwell for sometime, exhibiting worrisome fever, nausea and vomiting. Throughout the 6-month period, all her laboratory findings had been within normal ranges and she did not seroconvert. She was recorded to have been extremely anxious. One HCW on 3TC, AZT and indinavir was recorded to have had severe vomiting, nausea and vulval pruritus. She was treated with M*otilium* for two weeks to control the diarrhoea and C*anesten* cream for the pruritus. This same HCW was also recorded to have had a slight increase in Bilirubin levels and was advised to take more fluids, fruits and vegetables. All the other HCWs were also followed up for six months with clinical and laboratory findings being within the normal ranges.

The 50% who did not receive ARVs either declined initial evaluation and were therefore denied PEP, or they had been exposed to source patients whose

serostatus was confirmed negative and opted not to have PEP. Two of them, both subordinate staff, received Tetanus Toxoid vaccine.

4.1.3 KNOWLEDGE OF RISK OF OCCUPATIONAL HIV TRANSMISSION AND AVAILABLE OPTIONS FOR PEP

Majority (92.2%) of the respondents reported that they strongly believed that they were at risk of contracting HIV/AIDS from occupational exposure. This was strengthened by the findings of the FGDs where HIV/AIDS was mentioned as the biggest threat to health care workers in the workplace. The remaining (7.8%) did not believe that there was a likelihood of contracting this disease from their workplace but they well showed knowledge that there were indeed other hospital acquired (nosocomial) infections, which they gave examples as TB, Hepatitis B, and C, CMV, HTLVI and II, syphilis, skin diseases and others. Discussants also raised concern about these other nosocomial infections. Almost all (95%) the discussants correctly identified the modes through which HIV/AIDS is transmitted and included occupational exposure. The other 5% did not include occupational exposure as a factor but were well conversant with the other modes of transmission.

One hundred and sixty eight (83.2%) recorded that they had taken a protective measure against occupational HIV exposure while the remaining 34 (16.2%) did not record having done anything to protect themselves from occupational

exposure. The majority of the respondents (78.9%) considered caring for HIV patients just like caring for other patient. However, 68% reported fear of infection from occupational exposure.

Of the respondents, 127 (73.8%) correctly ranked neeedlestick injuries as the commonest mode by which HCWs become exposed to occupational HIV infection. Other modes mentioned included splashes onto mucous membranes (11.6%), cuts (8.7%), torn gloves (4.7%), and exposure through abraded skin (1.2%) as shown in Figure 10.

The area associated with the highest risk of exposure to HIV in the hospital settings was identified as the operating theatres (Figure 11). This was ranked first by 83 (56.1%) respondents. The other respondents identified the casualty department (24.3%), surgical wards (3.4%), medical wards (14.2%), and the dental unit (2%) as being the commonest areas from where injuries are encountered.

The commonest procedure associated with the highest risk of occupational HIV exposure was identified as Caesarean section, which was ranked first by 40.2% of the respondents. Other procedures included dental extractions (12.8%), general surgery (22%), orthopaedic surgery (11%), and general ward/clinic procedures (14%) as is shown on Figure 12.

Figure 10: Commonest mode of occupational exposure as mentioned by the respondents

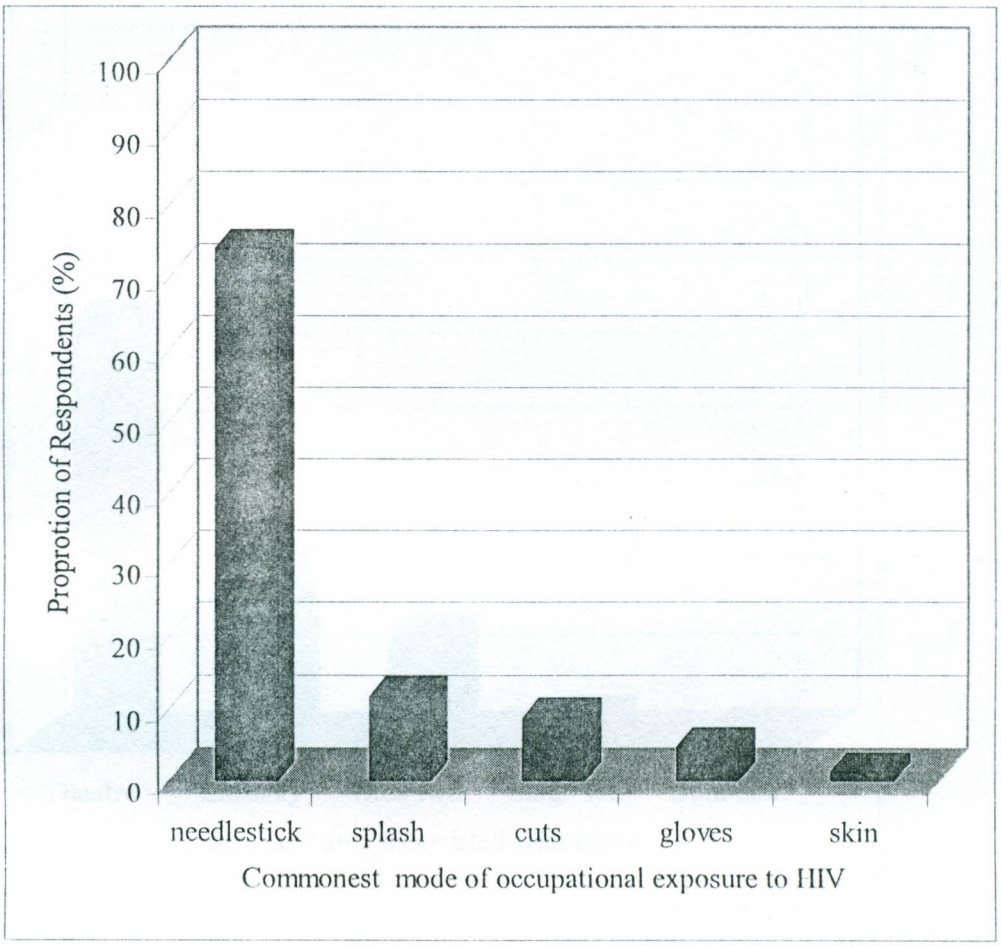
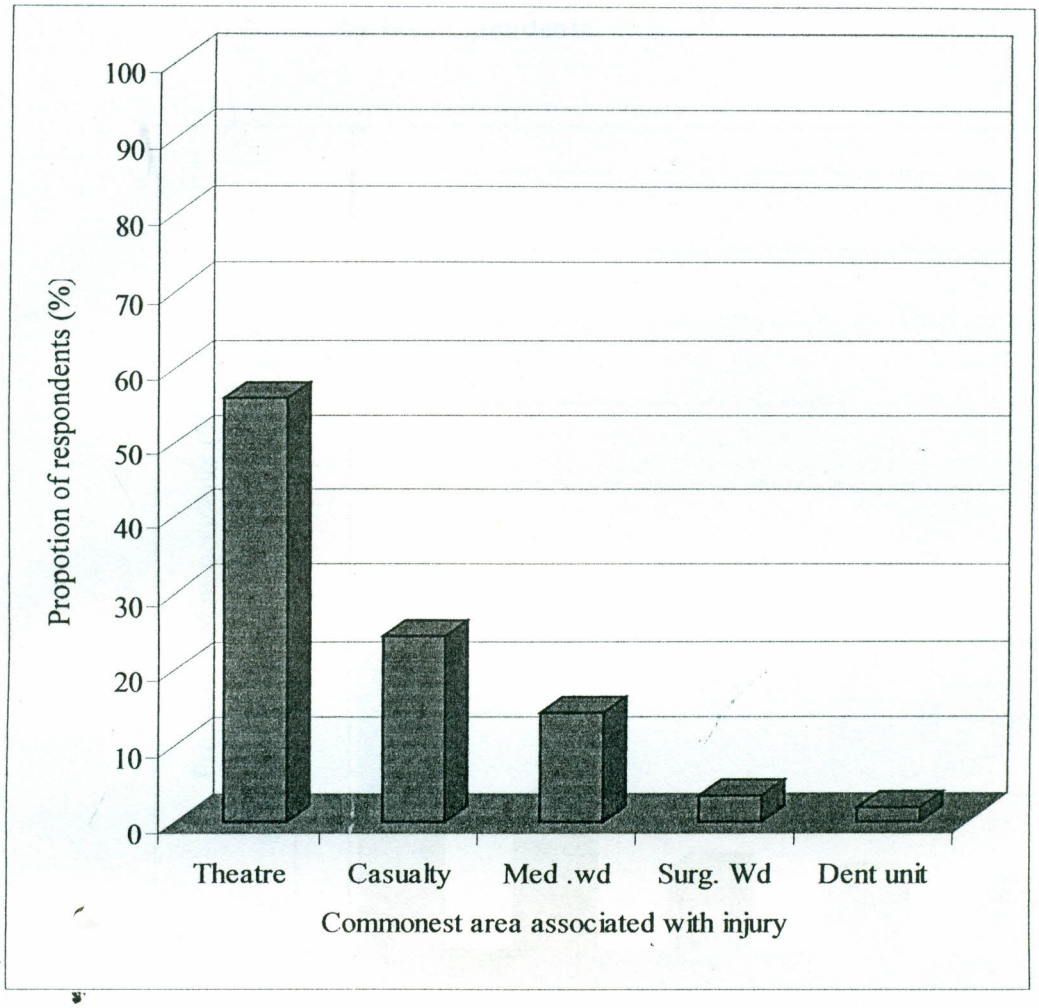


Figure 11: Commonest area associated with highest risk of occupational HIV exposure as mentioned by the respondents



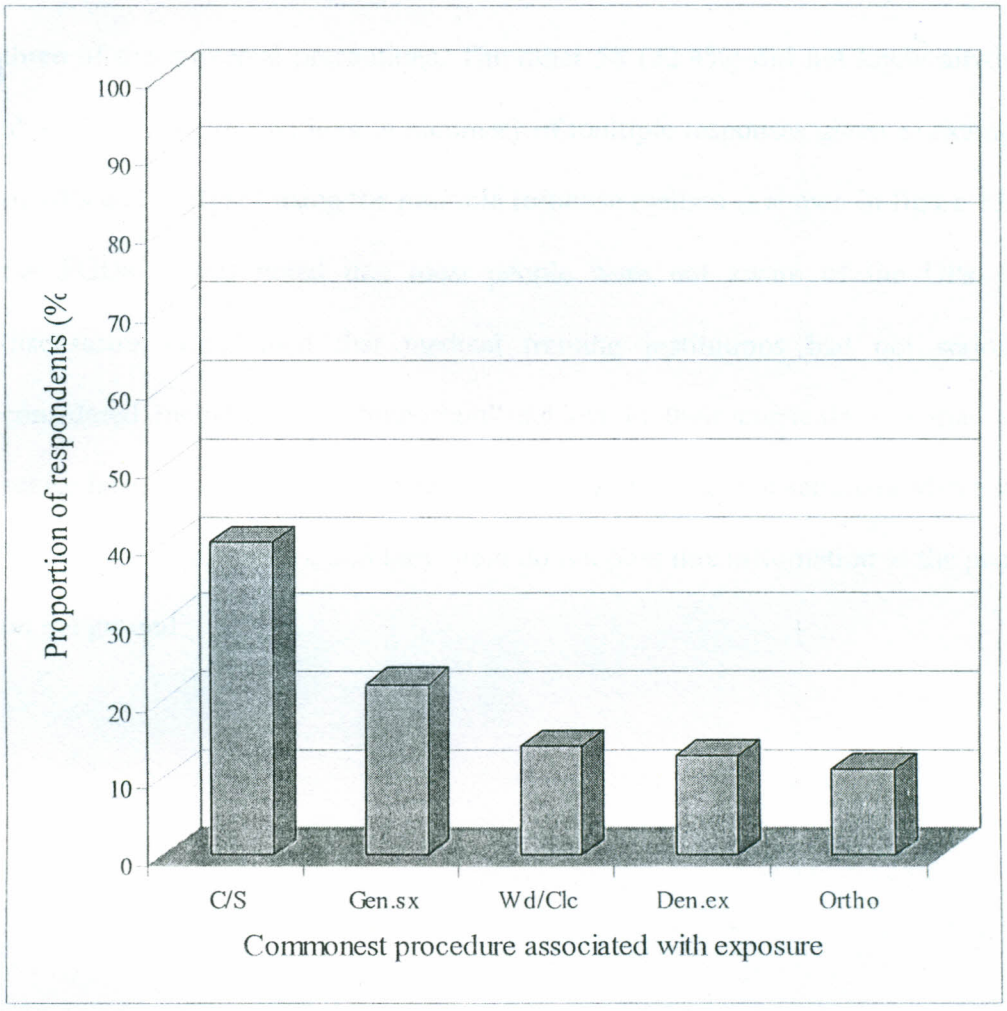
KEY:

Surg. Wd = surgical ward

Med.wd. = Medical ward

Dent unit = Dental Unit

Figure 12: Commonest procedure associated with exposure as mentioned by the respondents

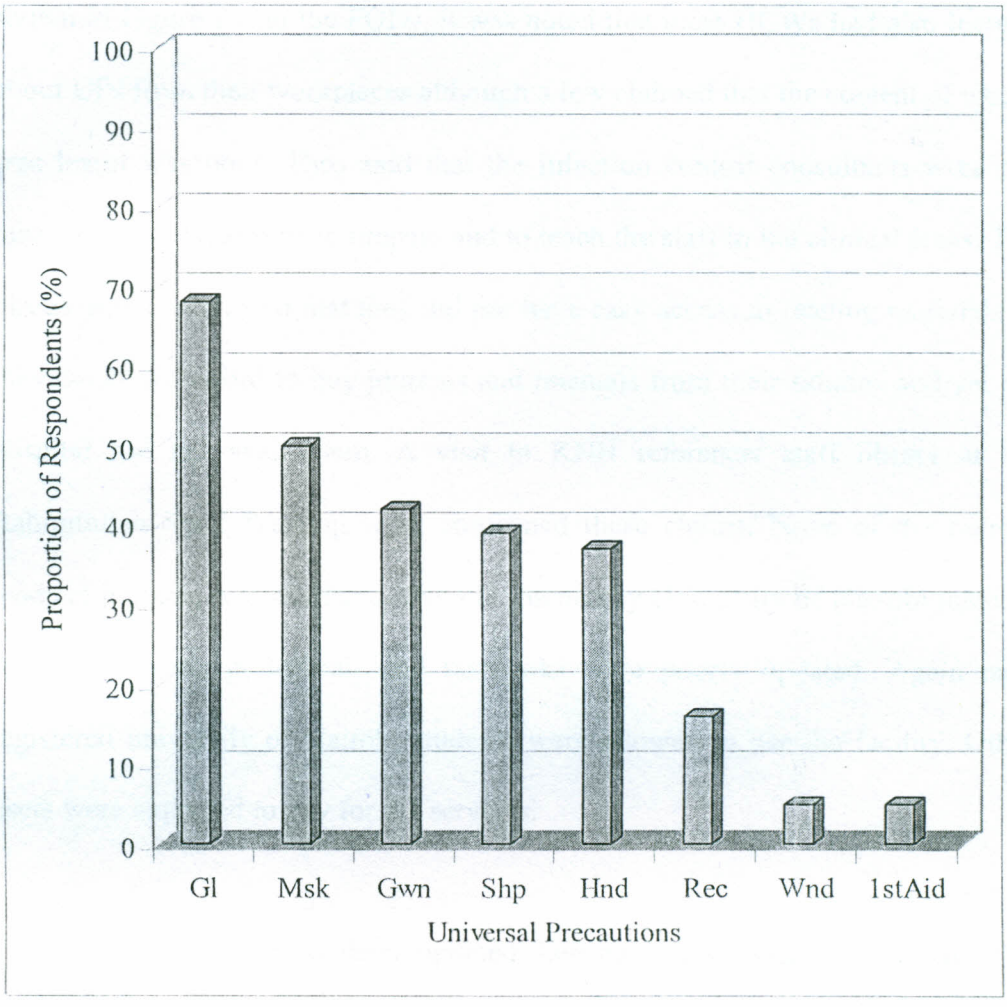


KEY

- Den. Ex = Dental extraction
- C/S = Caesarean section
- Wd/Clc = ward / clinic procedures
- Gen.sx = General Surgery
- Ortho = Orthopaedic surgery

Of the 179 respondents, 121(67.6%) had heard of the Universal Precautions (UPs) for prevention of nosocomial infections at the workplace as stipulated by WHO/CDC although only 44 (36.3%) of these were able to correctly list at least three of the universal precautions. The other 58 (32.4%) did not know anything about Universal precautions. A summary of multiple responses given as examples of UPs and analysed using the multiple response method is shown in figure 13. In the FGDs it was noted that most people were not aware of the UPs. The discussants complained that medical training institutions had not seriously considered including this "important" subject in their curricula and that only senior hospital managers attend professional conferences and seminars where such information is disbursed; and they often do not pass this information to the people on the ground.

Figure 13: Universal Precautions as mentioned by the respondents



KEY

Gl= Gloves

Gwn= Gowns

Msk= masks

Wnd= Wound covering

Hnd= Hand washing

Rec= Recapping of needles

Shp= Proper handling of sharps

1st Aid= Use of ambubags for First Aid/ resuscitation

The majority of the respondents (53.4%) learnt about UPs from the workplace as shown in Figure 14. In the FGDs, it was noted that most HCWs had also learned about UPs from their workplaces although a few claimed that the content of what was learnt was poor. They said that the infection control consultants were too busy and rarely had time to prepare and to teach the staff in the clinical areas. The discussants complained that they did not have easy access to reading materials as they could not afford to buy journals and manuals from their salaries and yet the hospital did not avail them. A visit to KNH reference/ staff library at the Rahimtullah Staff Training wing confirmed these claims. None of the current medical journals was available. Even in the nearby University of Nairobi medical library, journals, periodicals and textbooks were poorly updated. Again only registered university of Nairobi students were allowed to use the facility. Other users were expected to pay for the services.

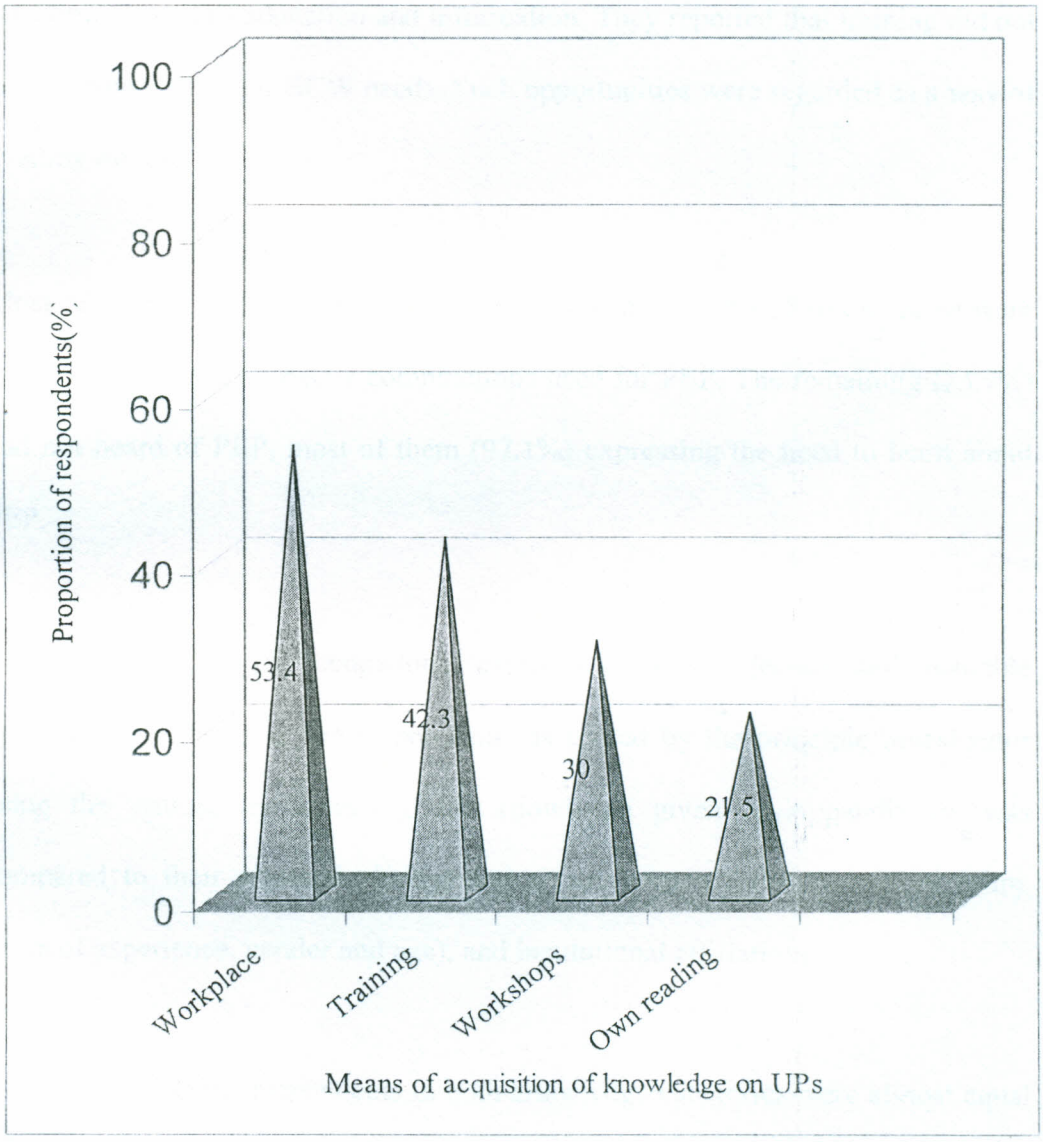
Only 21.5% of the respondents updated their basic knowledge by reading. The discussants said that they rarely had time to practice own reading and did not have easy access to reading materials.

The discussants complained that the workload was too heavy on them to afford time to read among other things.

Only a few 30% of the respondents had attended infection control conferences that discussed UPs while none of the FGD participants had had such an opportunity. It

was gathered from the FGDs that the seminars were infrequent and that their representation in them was inadequate, citing favouritism.

Figure 14: Means of acquisition of knowledge on Universal Precautions as mentioned by Respondents



In the FGDs it emerged that on -the-job staff education would reduce ignorance on the health care workers regarding particular issues. The discussants voiced the need for individual hospitals to educate its staff in upcoming issues to level down the disparities such as those brought about by different levels training (cadres) and different training institutions. Discussants generally complained about uncoordinated staff education and information. They reported that training did not considering individual HCW needs. Such opportunities were regarded as a way of evading duties.

Most of the respondents (76.3%) had heard about PEP and 55.6% of these were able to list the correct ARVs combinations used for PEP. The remaining (23.7%) had not heard of PEP, most of them (97.1%) expressing the need to learn about PEP.

Knowledge of risk of occupational exposure to HIV infection and available options for PEP among the respondents, as scored by the principle investigator using the criteria for assessing this knowledge given in Appendix iv, was compared to their personal characteristics (i.e. respondent's profession/ cadre, years of experience, gender and age), and institutional affiliations.

From table 2 below, respondents in both knowledge categories were almost equal in all the cadres. Chi-square test for significance reveals that there is no significant

relationship between the cadre of the respondent and their knowledge of risk of occupational exposure to HIV infection and PEP (X^2 = 1.708; df =4; P=0.786>0.05). However it was evident that the proportion of dentists with inadequate knowledge was higher that that of the other cadres.

Table 2: Relationship between the respondent's profession/ cadre and their knowledge of risk of occupational HIV transmission and available options for PEP

RESPONDENT'S PROFESSION	ADEQUATE KNOWLEDGE	INADEQUATE KNOWLEDGE	TOTAL
Dentist	3 (37.5%)	5 (62.5%)	8 (100%)
Lab. Personnel	10 (58.8%)	7(41.2%)	17 (100%)
Physician	21 (61.8%)	13 (38.2%)	34 (100%)
Nurse	63 (57.8%)	46 (42.2%)	109 (100%)
Surgeon	7 (63.6%)	4 (36.4%)	11 (100%)
TOTAL	98 (54.8%)	81 (45.2%)	179 (100%)

(X^2 = 1.708; df =4; P=0.786 which is >0.05, hence no significant difference).

N.B:Figures in parenthesis represent the results of Chi-square test for significance.

Table 3 shows that there were no significant differences in knowledge between female and male HCWs. The chi-square test for significance reveals no significant relationship between the gender of the respondent and their knowledge of occupational HIV exposure and the options for PEP (X^2= 0.20 df =1 P=0.888>0.05)

Table 3: Relationship between gender and the knowledge of risk of occupational HIV transmission and available options for PEP

GENDER	ADEQUATE KNOWLEDGE	INADEQUATE KNOWLEDGE	TOTAL
FEMALE	69 (58.5%)	49 (41.5%)	118 (100%)
MALE	35 (57.4%)	26 (42.6%)	61 (100%)
TOTAL	104 (58.1%)	75 (41.9%)	179 (100%)

(X^2= 0.20 df =1 P=0.888 which is >0.05, hence no significant difference >0.05)

There is no significant relationship between the respondent's age and their knowledge of occupational HIV exposure and the available options for PEP (X^2=1.708 df=4 P=0.789 >0.05), as shown in Table 4 below. Respondents in all age categories are almost equally distributed into the two knowledge groups (adequately knowledgeable and inadequately knowledgeable).

Table 4: Relationship between age and the knowledge of risk of occupational HIV transmission and available options for PEP

AGE	ADEQUATE KNOWLEDGE	INADEQUATE KNOWLEDGE	TOTAL
<26	8(44.4%)	10(55.6%)	18 (100%)
26-35	45 (67%)	34 (43%)	79 (100%)
36-45	35 (57.4%)	26 (42.6%)	61 (100%)
46-55	10 (50%)	9 (50%)	19 (100%)
>55	0 (0%)	2 (100%)	2 (100%)
TOTAL	104 (58.1%)	75 (41.9%)	179 (100%)

(X^2=1.708 df=4 P=0.789 which is >0.05, hence no significant difference >0.05)

From Table 5, it can be deduced that there is a significant relationship between the institution of affiliation and knowledge of risk of occupational exposure to HIV infection and available options for PEP (X^2 =8.368 df=2 P=0.015<0.05).

Table 5: Relationship between the institution of affiliation and the knowledge of risk of occupational HIV transmission and available options for PEP

HEALTH INSTITUTION	ADEQUATE KNOWLEDGE	INADEQUATE KNOWLEDGE	TOTAL
Aga Khan	33 (71.7%)	13 (28.3%)	46 (100%)
KNH	60 (57.7%)	44 (42.3%)	104 (100%)
Mbagathi	11 (37.9%)	18 (62.1%)	29 (100%)
TOTAL	104 (58.1%)	75 (41.9%)	179 (100%)

(X^2 =8.368 df=2 P=0.015 which is <0.05, hence there is a significant difference)

Length of service in a specific profession (years of experience), did not significantly affect the level of knowledge of risk of occupational exposure to HIV infection and available options for PEP (X^2=3.869 df=6 P=0.694>0.05) as shown in Table 6.

TABLE 6: RELATIONSHIP BETWEEN YEARS OF EXPERIENCE OF RESPONDENTS AND THEIR KNOWLEDGE OF RISK OF OCCUPATIONAL HIV TRANSMISSION AND AVAILABLE OPTIONS FOR PEP

YEARS OF EXPERIENCE	ADEQUATE KNOWLEDGE	INADEQUATE KNOWLEDGE	TOTAL
< 1	2 (50%)	2 (50%)	4 (100%)
1-5	35 (50%)	35 (50%)	70 (100%)
6-10	19 (35.2%)	35 (64.8%)	54 (100%)
11-15	11 (34.4%)	21 (65.6%)	32 (100%)
16-20	6 (40%)	9 (60%)	15 (100%)
21-25	1 (50%)	1 (50%)	2 (100%)
>25	1(50%)	1 (50%)	2(100%)
TOTAL	75 (41.9%)	104 (58.1%)	179 (100%)

(X^2=3.869 df=6 P=0.694 which is >0.05, hence no significant difference)

4.1.4 ATTITUDE TOWARDS PEP

Of the 179 respondents 86.9% indicated that they would consider taking PEP as a new therapeutic idea after significant exposure to HIV. Of these, 80% cited their strong belief that PEP works and that they would be protected against any possible infection. Those who said that they would not consider utilizing the service (13.1%) gave the following reasons: insignificance of the risk of infection after occupational exposure (21.7%), fear of adverse effects (14.4%), inability to afford (17.4%) strong belief that PEP does not work (21.7%), and fear of stigmatisation (17.4%). The majority of the respondents (69.6%) indicated their willingness to pay for PEP if they became significantly exposed to confirmed HIV-infected material from a seropositive patient. The remaining (30.4%) who said they would not be willing to pay anything for this service cited such reasons as the need or the institutions to guarantee the provision of the service (67.4%), lack of funds (10.9%), the perceived worthlessness of the service (19.6%) and the feeling that there is no watertight proof that PEP works (2.2%).

The gender of the respondents did not significantly affect their attitude towards PEP (X^2 =0.006 df=1 P=0.989>0.05)), neither did professional cadre (X^2=6.985 df=4 P=0.137>0.05), the hospital of affiliation (X^2=0.149 df =2 P=0.928>0.05), nor age (X^2=0.742 df=4 P=0.946>0.05). However, respondents' years of experience significantly affected the attitude of HCWs towards PEP (X^2= 15.17 df=6 P=0.019<0.05) as shown in the Tables 7-11.

Table 7: Relationship between gender of respondents and their attitude towards PEP

GENDER	RATIONAL ATTITUDE	IRRATIONAL ATTITUDE	TOTAL
FEMALE	67 (56.8%)	51 (43.2%)	118 (100%)
MALE	35 (57.4%)	26 (42.6%)	61 (100%)
TOTAL	102 (57%)	77 (43%)	179 (100%)

(X^2 =0.006 df=1 P=0.989 which is >0.05, hence no significant difference)

Table 8: Relationship between institution of affiliation and respondents' attitude towards PEP

HEALTH INSTITUTION	RATIONAL ATTITUDE	IRRATIONAL ATTITUDE	TOTAL
Aga Khan	19 (41.3%)	27 (58.7%)	46 (100%)
KNH	46 (44.2%)	58 (55.8%)	104 (100%)
Mbagathi	12 (41.3%)	17 (58.6%)	29 (100%)
TOTAL	77 (43%)	102 (57%)	179 (100%)

(X^2=0.149 df =2 P=0.928 which is >0.05, hence no significant difference)

Table 9: Relationship between profession/ cadre of respondents and their attitude towards PEP

RESPONDENT'S PROFESSION	RATIONAL ATTITUDE	IRRATIONAL ATTITUDE	TOTAL
Dentist	3 (37.5%)	5 (62.5%)	8 (100%)
Lab. Personnel	7 (41.2%)	10 (58.8%)	17 (100%)
Physician	16 (47.1%)	18 (52.9%)	34(100%)
Nurse	46 (42.2%)	63 (57.8%)	109 (100%)
Surgeon	5 (45.5%)	6 (54.5%)	11 (100%)
TOTAL	77 (43%)	102 (57%)	179 (100%)

(X^2=6.985 df=4 P=0.137 which is >0.05, hence no significant difference)

Table 10: Relationship between age of respondents and their attitude towards PEP

AGE	RATIONAL ATTITUDE	IRRATIONAL ATTITUDE	TOTAL
<26	13 (50%)	13 (50%)	26 (100%)
26-35	31(41.9%)	43 (58.1%)	74 (100%)
36-45	24 (40.7%)	35 (59.3%)	59 (100%)
46-55	8 (44.4%)	10 (55.6%)	18 (100%)
>55	1 (50%)	1 (50%)	2 (100%)
TOTAL	77 (43%)	102 (57%)	179 (100%)

(X^2=0.742 df=4 P=0.946 which is >0.05, hence no significant difference)

Table 11: Relationship between Respondents' Years of Experience and their Attitude towards PEP

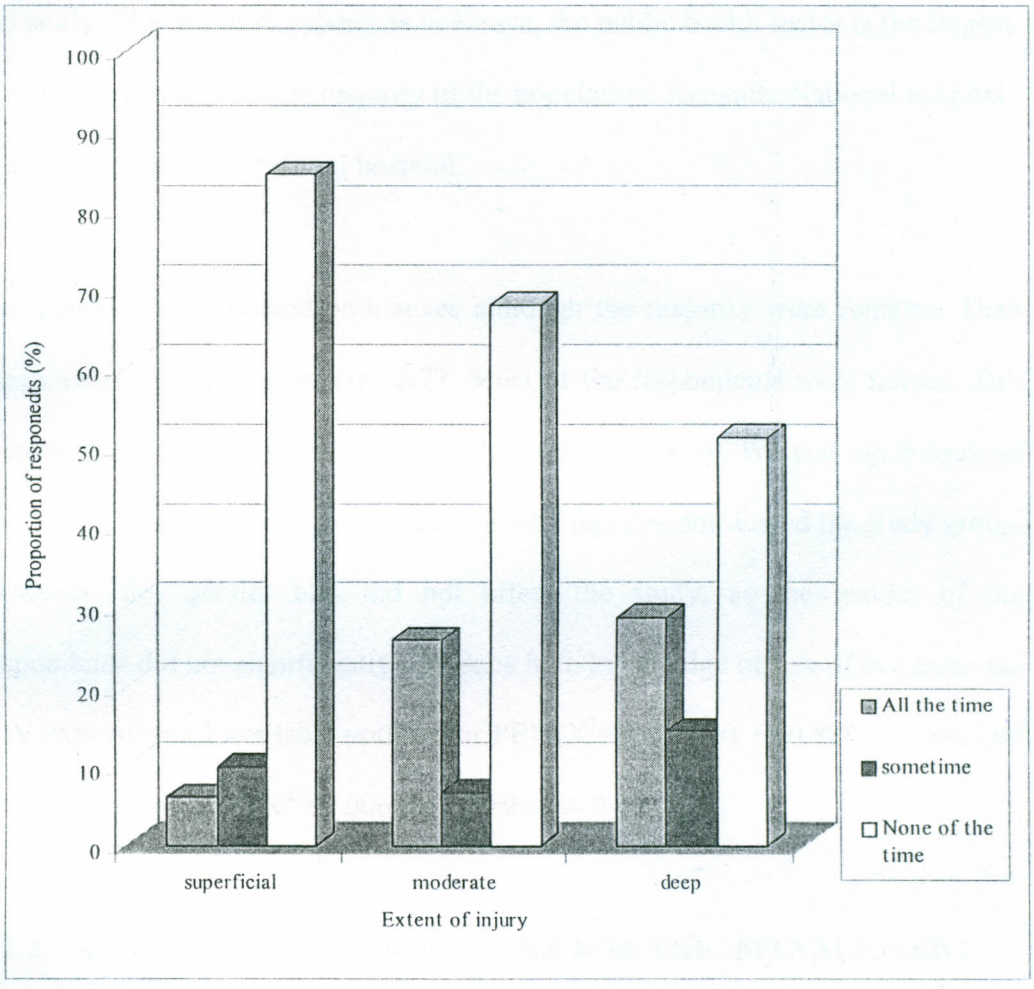
YEARS OF EXPERIENCE	RATIONAL ATTITUDE	IRRATIONAL ATTITUDE	TOTAL
< 1	1 (25%)	3 (75%)	4 (100%)
1-5	31 (44.3%)	39(55.7%)	70 (100%)
6-10	31 (57.4%)	23 (42.6%)	54 (100%)
11-15	12 (37.5%)	20 (62.5%)	32 (100%)
16-20	1 (6.7%)	14 (93.3%)	15 (100%)
21-25	0(0%)	2 (100%)	2 (100%)
>25	1 (50%)	1(50%)	2(100%)
TOTAL	77 (43%)	102 (57%)	179 (100%)

(X^2= 15.17 df=6 P=0.019 which is <0.05, hence there was a significant difference between the age categories)

4.1.5 LEVEL OF UTILIZATION OF PEP

Fifty two percent (52.2%) indicated that they had had recent (in the past 24 months) significant exposures to HIV requiring specialist attention, majority of who were nurses (60.1% of those with history of recent exposure). The extent to which they had been exposed ranged from superficial (57.6%), to moderate (33.7%), and to deep (8.7%). Of those who had had exposures, 14.7% sought PEP services all the time, 8.9% sought it sometimes, while 76.4% did not seek any form of attention. As shown in Figure 15 below, the proportion of respondents that did not seek PEP services at all decreased with an increase in severity of exposure i.e. it was highest among those who had superficial exposures and lowest among those that had deep exposures. On the other hand, the proportion of respondents who sought professional care after exposure increased steadily with increase in severity of exposure i.e. it was lowest within the group that had superficial exposures and highest among those who had deep exposures. However, the proportion of those that were deeply injured that sought PEP services was low (28.6%) as compared to those who did not at all seek the services (57.1%). Among those who had had superficial injuries, 5.9% sought the services all the time, 9.8% sought them sometime, while 84.3% did not at all seek it. In the FGDs none expressed the fact that they had been significantly exposed to HIV at work and therefore none of them had had the need to seek for PEP services.

Figure 15: Distribution of respondents by Extent of injury and Level of utilization of PEP services



4.2 DISCUSSION

4.2.1 DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

The Public health sector constituted most of the respondents that were included in the study. This is not surprising as in Kenya, the public health sector is the largest health provider and serves majority of the population. Kenyatta National hospital is the largest national referral hospital.

The study group included both sexes although the majority were females. Their mean years of experience were 2.77. Most of the respondents were nurses. This was expected because nurses form the majority of the HCWs and since most of them are females this explains the reason why females dominated the study group. However, this gender bias did not affect the study, as the gender of the respondents did not significantly influence both knowledge of risk of occupational HIV exposure and available options for PEP (X^2=0.20 df=1 P=0.888 > 0.05), and attitude towards PEP (X^2 =0.006 df=1 P=0.989>0.05).

4.2.2 AVAILABILITY OF GUIDELINES FOR THE MANAGEMENT OF POTENTIALLY EXPOSED HCWS

Although clear guidelines on PEP management were available at KNH and AKH, the management of HIV is a very dynamic field and the dynamism is aimed at improving survival compliance and efficacy of treatment regimens. This is the

reason why PEP management guidelines need to be updated regularly to incorporate new findings.

KNH differsfrom other public health institutions (like MDH) in that being a national referral and teaching hospital and a parastatal body, the institution enjoys a semi-autonomous decision making / policy formulation environment.

Record keeping in the AKH was found to be generally better than that of KNH because medical information for exposed HCWs was compiled in their files. This was probably because the infection control unit in AKH was more actively involved in surveillance than the one in KNH. At the time of this study a concurrent study was being done to assess the use of newly introduced leak-proof sharps containers and review the application of UPs in the Hospital. PEP service provision in KNH was so much disintegrated such that it was difficult to track lost records and parts of the HCWs information related to reported incidents. For example, there was no special clinic for reporting occupational exposures. While this was done at the main staff clinic during the day, services were offered at the casualty after office hours. Counselling and testing for HIV was done at the Voluntary Counselling and Testing (VCT) centre while records were kept at the infection control unit. The physical distances involved resulted in incoordination and loss of information. Gerald & Richard (1992) emphasised that a careful review of record keeping practices and how medical information is maintained

and distributed can help to identify ways to stop unnecessary disclosure of patient information. This is also true of integrating HIV counselling, testing and PEP to reduce the number of contacts an exposed HCW has to disclose the incident to. A long reporting procedure reduces the degree to which confidentiality is safeguarded and assured and therefore discourages the HCWs from reporting incidences that would otherwise require specialised attention as was evident at KNH. This was not so in AKH where counselling and testing were performed at the staff clinic. The attending physician then took the anonymously labelled sample to the laboratory for analysis and HIV tests from where the results were conveyed by phone to the attending physician. This ensured that the laboratory personnel did not unnecessarily know from whom the samples were taken. He then issued the drugs for PEP after carefully considering the available choices with the HCW. It was his duty to ensure that the staff clinic was stocked with ARVs for emergencies. This excluded the need for the exposed HCW to visit the hospital pharmacy, further making the exercise more confidential. Proper reporting is imperative in management of exposed HCWs, identification of continuing hazards and in evaluation of prevention measures already in place. Long reporting procedures appear unsupportive and punitive to the exposed HCW (UNAIDS, 2001).

4.2.3 KNOWLEDGE OF RISK OF OCCUPATIONAL HIV TRANSMISSION AND AVAILABLE OPTIONS FOR PEP

The 2001 NASCOP annual report showed that the number of HIV cases in Kenya is increasing steadily and has more than doubled in the last decade. (NASCOP, 2001). Almost all the respondents and discussants were aware that HIV is a serious public health problem in Kenya and the rest of the world. This attitude suggests that the HCWs may promote current and future efforts to prevent and control HIV in this region including appropriate use of PEP. Similar results were obtained in Brazil where HCWs considered HIV/AIDS to be a worrisome public health nuisance and reported that its epidemiological situation there was high (Noshioka et al., 1998). HIV is alarmingly increasing even to encroach new areas such as Central and Southern Asia, and Russia (IAVI, 2002). Majority of them expressed their worry about contracting HIV from the patients they cared for especially those whose sero-status was unknown. The discussants suggested that routine HIV tests be carried out on each patient admitted in hospital. This would probably allay some fear associated with exposure to blood and body fluids, as HCWs would be more cautious while dealing with the sero-positive cases. This would however further deprive the patients' rightful quality care they deserve from HCWs in spite of their HIV status. And in a region with relatively high HIV prevalence, it is unlikely that HCWs will work in a HIV-free environment. The most important aspect of prevention therefore primarily remains to protect oneself

from exposure by adhering to the UPs and to promptly seek PEP services whenever accidents occur (CDC, 1988).

Institution of affiliation significantly related to the level of knowledge of risk of occupational HIV transmission and available options for PEP. This is probably because the training emphasis laid upon this topical issue is different in each hospital. Other than MDH the other hospitals had more HCWs with adequate knowledge than those with inadequate knowledge.

Although more than half (64.8%) of the HCWs knew or had heard about UPs, only 36.3% of them could correctly list at least three universal precautions. Similarly, Duff and his colleagues (1999) showed that although 70 percent of the public sector surgeons had heard about UPs, majority (88.4%) of them expressed inability to further elaborate on their knowledge. These two findings suggest that information, education and communication, and co-operation between policymakers, enforcers and the HCWs is poor. It could also imply that HCWs are not actively searching for knowledge. It would also mean that the health care facilities do not avail updated reading materials for their staff, or that these materials are not accessible to the HCWs.

In general the HCWs in the selected hospitals knew the modes by which they could be exposed to occupational HIV transmission. They were also aware of the

most risky areas to work in as far as these exposures are concerned. While majority of the HCWs strongly considered themselves at risk of occupational HIV transmission, the fear associated with this consideration was not quantified. This fear could have a reasonable impact on the quality of health care received by the patients. Gerbert and his colleagues (1988), observed that HCWs took extreme care (probably due to fear of infection), when working on confirmed HIV patients further increasing the stigma attached to this disease. Suspicion index on patients thought to be having terminal illnesses was found to be high, thereby compromising the quality of patient care. Medical ethics condemn this compromise because every patient is said to have a right to quality medical care.

Although majority of the HCWs (76.3%) knew about PEP, only about half of these (38.2%) were able to correctly name the recommended ARV regimens for PEP. Similarly, only a few of the discussants knew these regimens. This is a serious omission among the HCWs that should be addressed. While the injured HCWs are themselves attended to by other physicians, it is important that all the participants in the health care system have perfect knowledge on HIV PEP i.e. both the care givers and the beneficiaries must be adequately informed to ensure efficient service delivery (Duff *et al., 1999)*. Inadequate knowledge leads to non-adherence and undue fear of reversible side effects, which in turn jeopardizes the whole exercise of PEP. Non-adherence to ARV regimens leads to development of

resistant mutant strains of HIV making the fight against this infection even more intense.

Seventy five percent of the discussants admitted that they did not know enough about PEP and occupational exposure to HIV and almost all were willing to be educated further on these areas. This is important because HCWs need to know facts concerning the two issues. ARV treatment and their adverse effects were the most commonly mentioned topics in PEP on which the HCWs felt they needed further education. Adequate knowledge of the different regimens for PEP is important because PEP rests on the correct combination, proper dosage and a sufficient period of time depending on the type and extent of exposure, the infectivity of the source patient (e.g. patient in end-stage AIDS disease) and the prevalence of HIV in the population in question.

While training was evident in both KNH and AKH concerning occupational exposure and PEP, the study noted a few loopholes. In none of the institutions was training given as an induction before new employees are deployed on the job. There was no evidence either that there was annual training or consistent periodic reminders of the procedures to be followed in the event of exposure as suggested by Gerald & Richard (1992).

In KNH most of the HCWs who reported significant exposures to the relevant clinic and were put on ARV treatment for PEP never turned up for follow-up. The outcome of therapy was therefore unrecorded. Similarly, a study done in South Africa revealed that there was no organised follow-up of HCWs after PEP was administered (Gounden & Moodley, 1999). Both studies imply that surveillance measures for control of occupational HIV transmission are still unsatisfactory. On the same note discussants in this study cited lack of necessary facilities, inadequate HCW knowledge on the need follow-up after exposure, and a negative attitude towards HCWs by the attending physicians as the main reasons to why most HCWs did not go for follow-up. On the contrary, in the South African study, long procedures and stigma attached to HIV exposure were reported as the reasons why HCWs did not want to be followed up (Gounden & Moodley, 1999).

Hand washing, use of gloves, gowns and eye protection/ masks and proper use and disposal of sharps were the most commonly mentioned UPs. Avoidance of resheathing needle after use, exclusion of workers with exudative wounds and weeping dermatitis and non-use of mouth-to-mouth resuscitation during emergencies were rarely mentioned. Participant observations revealed that most HCWs were not keen enough about hand washing, use of masks and eye protection. Even in operating theatres only a few HCWs (5%) used eye protection although other protective devices such as gowns, boots, gloves and masks were used appropriately. Hand washing in theatre was done perfectly using the right

techniques and at the right time. In the wards, several HCWs were observed using the same pair of gloves to attend to a number of patients, and not washing hands after attending each patient. Gloves may give the HCWs a false assurance of personal safety and disregard the safety of the patient, which is also a paramount issues in infection control.

4.2.4 LEVEL OF UTILIZATION OF PEP SERVICES

Out of the 90 respondents who reported that they had been significantly exposed to HIV at the workplace, only 14.7% had sought professional attention all the time. This shows that the level of utilization of PEP services in the hospitals in Nairobi was still relatively low. Even though not all exposures necessarily call for use of PEP, every occupational exposure imperatively requires professional attention. Other services such as counselling, clinical and laboratory evaluation may be necessary even in the absence of an ARV prescription. Records for HIV exposures however showed that of all the reported cases in KNH, 92% were offered ARVs but records for compliance and treatment outcomes were unavailable. In AKH all reported cases were treated with ARVs. In both hospitals it was not established the criteria used to arrive at that decision. Sepkowitz and his colleagues (1998) carried out a similar study and found that only 40% of HCWs completed their ARV regimens. The reasons for discontinuation were mainly associated with adverse effects of the drugs and negative serology results of the source patient. Grime and colleagues (2000), also reported that in a survey

conducted among HCWs in both urban and rural settings PEP use was found to be below average (38%).It is only through reporting that the employers can correctly quantify the risk and probably device more meaningful preventive measures for example, device new equipment to reduce exposure. Other services that may and should be obtained from this clinic whether or not ARVs are prescribed include sterile dressing of exposure wounds and vaccination against Tetanus infection

4.2.5 ATTITUDE TOWARDS PEP

Respondents' years of experience significantly affected attitude towards PEP (X^2= 15.17 df=6 P=0.019>0.05). This is probably because when a HCW has worked longer in their respective professions, they probably feel that they have gained more skills and therefore less at risk of occupational injuries, resulting to a more irrational attitude towards PEP. This was not the case with hospital of affiliation (X^2=0.149 df =2 P=0.928 >0.05), which was hypothesised to significantly affect attitude. This may however have been an incidental finding for which further research is needed to give better insight to this kind of relationship.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 A SUMMARY OF CONCLUSIONS

a) Health care workers in Nairobi were generally aware of the risk of occupational HIV transmission. However knowledge what should be done after exposure was inadequate.

b) AKH, a private health institution was better equipped to handle occupational exposures to HIV than KNH and MDH, which are public health institutions. This was shown by the fact that AKH had better facilities and updated guidelines for the management of exposed HCWs. A special clinic designed for management of occupational exposures was in place.

c) PEP services were generally more available and accessible in AKH than both MDH and KNH. The study showed that in AKH PEP services were more consolidated in one site increasing accessibility and confidentiality of HCWs. KNH was more advantaged in terms of availability of PEP than other MDH.

d) Mbagathi District Hospital did not have PEP services in place and was therefore not attending to their HCWs who become occupationally exposed to HIV infection.

e) KNH differs from MDH in that it is autonomous in formulation and enforcement of policies. It has a relatively safer working environment than other public health institutions.

f) The PEP guidelines currently available are adequate in consistency and completeness. However they are not available and accessible to all the HCWs in Nairobi as evidenced by the fact that the guidelines were either unavailable as was the case of MDH, or were outdated as was the case in KNH.

5.2 RECOMMENDATIONS

(a) HIV infection control seminars should be organised more often to update HCWs on latest scientific information. They should be all inclusive in terms of cadre, age, sex, experience etc. More emphasis should be directed towards prevention of primary infection of HIV as an overall practice and also the use of PEP in accidental exposures.

(b) Training should be done at deployment and at least annually to improve knowledge. The sessions should be interactive in nature to allow for opportunity for discussions with qualified trainers.

(c) The government should equip the public health facilities with the necessary policies, protective gear, equipment and ARVs for PEP. This would ensure equitable access to PEP services whenever it is necessary. Since it may not be economically feasible to install PEP facilities in all

public health institutions including health centres and dispensaries, the government should set up regional drop-in clinics for PEP that are accessible to all the HCWs in that region.

There is need to consolidate data collected from all the institutions of health regarding occupational HIV exposures and PEP in Kenya. This will serve as a reference point in future to assess the plight of HCWs as far as these exposures are concerned. The MOH through NASCOP should establish a national exposure/ PEP registry where such information is stored. This way, it would be possible to institute follow- up mechanisms as a national concern.

(d) Information conveyed to the HCWs should be accurate. It should clearly delineate between what is known, what is unknown and what is reasonable speculation. Data presented to HCWs should be interpreted in a conservative way to allow for recognition and explanation for inconsistencies.

(e) Management must not try to eliminate HCWs' fear of getting AIDS (because this will exist as long as there is a risk of occupational transmission and no cure), but should aim at preventing it from compromising the quality of care and from threatening the HCWs' well being. This study suggests use of small group discussions to address HCW fears.

(f) The government and individual non-governmental health institutions should establish and implement a policy for compensation of HCWs for occupational injuries or accidents. This in itself is a motivator towards reduction of fear and improvement of quality of care.

(g) There is need therefore for employers to frequently update their guidelines to incorporate new scientific findings and upgrade their practices to international standards. WHO/CDC recommends use of standardized regimens but also leaves room for country-to-country variations according to their national HIV/AIDS prevention and control programmes (CDC, 1998).

(h) Effective communication, education and information is important because it encourages the HCWs to know and follow formulated guidelines / precautions to prevent nosocomial infections such as HIV. To be effective, occupational HIV control programmes require the support of both the HCWs working directly on patients, the hospital administrators and the policymakers (government).

5.3 SUGGESTIONS FOR FUTURE RESEARCH

(a) Studies should be conducted to find out the risk of HIV transmission from HCWs to patients, as HIV knows no professional boundaries.

(b) It is important to carry out studies to quantify the amount of risk associated to percutaneous injuries in local settings of high HIV prevalence, heavy workload and inadequate facilities.

(c) A study should be conducted to actively follow-up HCWs who have been significantly injured and put on ARVs for PEP. To assess the level of compliance, drop out rate and to closely monitor (by laboratory and clinical findings) the adverse effect of ARVs used for PEP and the development of HIV infections if any.

(d) There is need to conduct a similar study in Kenyan rural areas to determine whether they differ at all from urban based health facilities in terms of knowledge, attitude and practice of PEP.

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APPENDICES

APPENDIX I: INTERVIEW GUIDE FOR HOSPITAL ADMINISTRATORS IN CHARGE OF INFECTION CONTROL

1. Do you as an institution have a written protocol highlighting the practice guidelines for the management of ***Health Care Workers*** (HCWs) accidentally exposed to the potential or confirmed HIV-infected fluids? *(Request to see the guidelines)*

   YES NO

2. If YES to Q.1
   (a) When were the guidelines first prepared?
   (b) When were they last updated? (*See an updated copy*)

3. What were the sources of information consulted in preparing and / updating the guidelines?

4. Are these guidelines of any importance to the HCWs in this institution?

   YES NO

5. Generally, are the HCWs in this institution following the guidelines provided?

   YES NO

6. Do you have a selected station where PEP services are provided in this institution or elsewhere?

   YES NO

7. Do you have specially trained practitioners providing the PEP services in this hospital?

   YES NO

8. If NO, who does it?

9. Are the PEP drugs usually available for the HCWs?

YES NO

10. If you do not have your own provision for PEP services in this institution, are there any arrangements between this institution and others to consult in times of accidental exposure of HCWs?

YES NO

11. How effective/successful are these arrangements in alleviating the problems?

12. If NO to Q.1, what are the reasons for not having the guidelines?

APPENDIX II: QUESTIONNAIRE FOR HEALTH CARE WORKERS INDIRECT CARE OF PATIENTS

CONSENT EXPLANATION

My name is *Jane Wangechi Maina*, a Master of Public Health and Epidemiology student at Kenyatta University. I am carrying out a study entitled "***Utilization Of HIV Post Exposure Prophylaxis Among The Occupationally At Risk Health Care Workers In Nairobi Province***". It is aimed at establishing the factors that influence utilization of PEP services among the HCWs and probably coming up with feasible suggestions for promotion of occupational health. This study involves filling in of self- administered questionnaires and as such, the study has no associated risks. With the understanding of your busy work schedules, you have at least three days to return the questionnaire. For the purposes of confidentiality, you are requested not to write your name anywhere on it. I remind you that this exercise is purely voluntary although I will appreciate all your contributions. Thank you in advance.

Jane W. Maina, Kenyatta University, Dept of Zoology, P. O. Box 43844, NRB.

.....

I have read the Consent information, understood the requirements of this study, and voluntarily agree to participate.

Signed_____ Date_____

Q.1 Have you heard about the *UNIVERSAL PRECAUTIONS* for prevention of nosocomial infections at the workplace as stipulated by he World Health Organization (WHO) or the Centres for Disease Control & Prevention (CDC)?

1=YES 0=NO

Q.2 If YES to Q.1,

(a) Where did you get the information?

1=During my training
2= At my work place
3= From workshops/Scientific conferences attended
4= During my own reading

(b) Please list any five (5) of these *Universal Precautions*

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

Q.3 Does you institution have an organized infection control department?

1=YES 0=NO

Q.4 Have you done anything in the past 2 months to protect yourself from occupational HIV infection?

1=Yes 0=No

Q.5 If Yes to Q.4 please list what you have done

_____

_____

_____

_____

Q.6 In the past 6 months, have you considered yourself significantly exposed to HIV infection during performance of your job duties?

1=Yes 0=No

Q.7 If Yes to Q6, what action(s) did you take?

1=Had a HIV test immediately.
2=Reported to your in charge promptly
3=Sought privately (at your own cost) PEP services from another medical institution.
4=Reported to the staff clinic promptly.
5=Ignored

Q.8 Which is the most frequent mode through which Health Care workers become occupationally exposed to HIV infection?

1=Needle stick injury
2=Splashes onto mucous membranes.
3=Torn/poor quality gloves
4=Cuts
5=Non-intact (abraded) skin

Q.9 In your own opinion in which area is exposure commonest?

1=Casualty department
2=Operating theatres
3=Surgical wards
4=Medical wards Paediatric ward
5=Dental unit

Q.10 Which of these procedures would you associate with the commonest accidental exposure to HIV?

1=Dental extraction
2=Caesarean section
3=General surgery
4= Orthopaedic surgery
5=General ward/ clinic procedures

Q.11 Do you at all consider yourself at risk of acquiring HIV infection from occupational exposure?

1=Not at all
2=To some extent
3= strongly Yes

Q.12 If you do not believe in Q.11 above, do you believe that you can acquire other infections from the health care settings?

1=Yes 0=No

Q.13 If Yes, which ones? *(Please list them)*

_____

_____

_____

_____

Q.14 (A) Are you worried of contracting HIV infection from patients while performing your duties?

1= very much
2=Sometimes
3=Not at all

(B) Give reasons for your response in Q.14 above
1= cannot contract HIV from patients
2=HIV is quite infectious even from patients
3=lack of protective gear and other facilities

Q.15 Have you heard about post exposure prophylaxis for HIV infection acquired through occupational exposure?

1=Yes 0=No

Q.16 If Yes to Q.15, do you know any of the combination(s) of antiretroviral drugs used for this exercise? *(Please give examples)*

_____

_____

_____

_____

Q.17 If No to Q.15, would you like to learn about HIV post exposure prophylaxis?

1=Yes 0=No

Q.18 In the past 24 months, how many times have you considered yourself significantly exposed and requiring specialized attention?

1=1-5 times
2=>5 times
3=Not at all

Q.19 According to the classification below what do you think was the extent of most of your injuries?

1=*Superficia*l (surface scratch with absence of bleeding)
2=*Moderate* (penetration of skin and bleeding)
3=*Deep* (deep puncture or wound with/ without bleeding)

Q.20 Of these times how often did you consider utilizing the HIV post exposure prophylaxis services?

1=None of the times
2= Sometimes
3=Most of the times
4=All the time

Q.21 Where did you obtain the services?

1=Your place of work
2=Another major hospital (please name it)
3=Private medical practitioner
4=Private pharmacist

Q.22 What is the main reason you chose that place?

1= cost
2=privacy/confidentiality
3=close proximity
4=availability of skilled specialist
5=reliability of the institution

Q.23 From the institution you obtained PEP what types of services were on offer?

	Yes	No
Post exposure counselling	1	0
Initial HIV testing	1	0
Antiretroviral drugs	1	0
Serologic follow-up	1	0
Laboratory and clinical monitoring for unwanted effects	1	0

Q.24 Were these services free?
1=Yes 0=No

Q.25 Are you satisfied with the way PEP services are offered in your institution or elsewhere?

1=Yes 0=No

Q.26 If No to Q.25, please give reasons

_____

_____

_____

_____

Q .27 If you obtained the PEP services in a place outside your institution and you were charged, does your institution have provisions for a refund?
1=Yes 0=No

Q.28 If No to Q.25, what reasons were given?
1=Your institution does not recognize the need for PEP services
2=Your institution cannot afford to refund.
3=Health care workers in your institution work at their own risk.

Q.29 If you found yourself significantly exposed to HIV infection at work would you consider taking up the new therapeutic idea?
1=Yes 0=No

Q.30 If Yes to Q.29, what would trigger you to go for it?
1=I would be cured of any possible infection.
2=There would be nothing to lose if I took the drugs – I would still succumb to illness even if I did not.
3=As a workplace requirement
4=Plans to have a child/children
5=I strongly believe it works.

Q.31 If No to Q.29, why?
1=I do not think the risk of acquiring HIV after occupational exposure is at all significant.
2=I'm afraid of the unwanted effects.
3=I cannot afford to pay for it
4=I strongly believe it does not work

5=Fear of stigmatisation
6=There is no watertight proof that PEP works

Q.32 Now I would like you to imagine that you became substantially exposed to a large amount of blood through deeply cut skin. And suppose you found out that the source patient has tested positive for the virus that causes AIDS, would you be willing to pay anything for post exposure prophylaxis?

1=Yes 0=No

Q.33 If Yes to Q.32, and keeping in mind the limitation of your income and other expenditures, how much would you be willing and able to pay for such a service?

1	KSh.250,000	4	KSh.20,000	7	KSh.2,000
2	KSh.100,000	5	KSh.10,000	8	Unlimited
3	KSh.50,000	6	KSh.6,000		

Q.34 If No to Q.32, why wouldn't you be willing to pay?

1= Services should always be provided free.
2=I don't have sufficient money to pay
3=The services are not worth anything to me

APPENDIX III: QUESTION GUIDE FOCUS GROUP DISCUSSION

Section A: General Introduction to the group

My name is Jane Maina from the Department of Zoology, Kenyatta University.

I would like to welcome you all to this participatory group discussion and thank you all for coming.

I would like us to discuss issues concerning utilization of HIV post Exposure Prophylaxis by health care workers in your institution in the next one hour. I encourage you to express your ideas freely for all information collected from this discussion will be treated as a group contribution. The information collected will be valuable to the study and may help to improve knowledge and actual utilization and delivery of this service in our health facilities.

With me are_____ and _____ who will help me record the key issues and other factors that may influence the interpretation of information as you raise them in this session.

Names of Assistant Moderators

1.

2.

Date of FGD_____ Time FGD started_____

Venue_____ Time FGD ended _____

Number recruited for FGD_____ Number attended FGD_____

Section B: Risk of Occupational Exposure to HIV

I would like us to start with discussing about HIV/AIDS and its role in health care delivery.

Explore:

- Transmission modes, perceived possibility of occupational HIV transmission, level to which the discussants feel threatened by the disease as far as their job is concerned.
- Reasons for the threat
- How to prevent occupational exposures
- What role does the institution play in prevention?
- Willingness to attend to HIV/ AIDS patients
- Situation of HIV/AIDS in the hospital/town/ country (perceived burden of disease)
- Patient testing
- Modes of exposure to HIV

Social demographic data of the discussants

No.	Years of experience	Age	Cadre	Gender

Section C: Knowledge of PEP

I would like us to talk about what one needs to do if they are significantly exposed to HIV.

Explore:

- Actions taken after exposure
- Knowledge about PEP (Heard about it?)
- Availability of correct drug regimens
- How important is /would PEP be to you?
- Would you be willing to pay to obtain it?
- Problems encountered and how they can be solved.

Section D: Attitude towards PEP.

I would like us to talk about your actual feelings about PEP

Explore

- Need for education on PEP
- Implications of exposure
- Efficiency of any institutional practice guidelines
- Need to be tested for HIV initially
- Efficacy of drug and related fears

Section E: Institutional factors

I would now like to discuss about your institution as regards occupational exposure to HIV and other diseases:

Explore

- Terms of service (per verbatim)
- Opinion about the institution PEP
- Service delivery to HCW
- Reporting system/ procedure
- Staff education
- Infection control department and its activities

Section F: Future Prospects

Finally I would like us to discuss about the future of the battle against occupational exposure to HIV infection in this institution and in the country at large.

VALEDICTUM

It has been a wonderful discussion indeed. I would like to thank you for your contributions which will be helpful in writing the Research report and in- turn to the improvement of PEP service delivery in this institution and in the entire country

APPENDIX IV: CRITERIA FOR ADEQUATE KNOWLEDGE ON RISK OF OCCUPATIONAL HIV TRANSMISSION AND AVAILABLE OPTIONS FOR PEP, AND RATIONAL ATTITUDE TOWARDS PEP

Part 1: CRITERIA FOR ADEQUATE KNOWLEDGE OF PEP AND AVAILABLE OPTIONS FOR PEP

1. Heard of Universal Precautions _____ 1 score
2. At least three UPs _____ 1 score
3. Done anything to protect oneself _____ 1 score
4. At least two protective measures _____ 1 score
5. Strongly considers oneself at risk of occupational HIV exposure __ 1 score
6. Commonest mode of occupational exposure (needle stick) _____ 1 score
7. Commonest area of injury (theatre) _____ 1 score
8. Commonest procedure associated with injury (C/S) _____ 1 score
9. Heard of PEP _____ 1 score
10. Correct ARV combination(s) _____ 1 score

A total of 10 scores.

A score of 5 and above will be considered as adequate knowledge

Part 2: CRITERIA FOR RATIONAL ATTITUDE TOWARDS PEP

1. Does not know about PEP and is willing to learn_____1 score
2. Would consider PEP after significance exposure_____1 score
3. Strongly believes PEP works_____1 score
4. Willing to pay for PEP_____1 score

A total of 4 scores.

A score of 3 and above will be considered as rational attitude.

APPENDIX V: ETHICAL CLEARANCE DOCUMENTS

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840, Tel: (02) 722541,Fax(02) 720030, KEMRI, NAIROBI, Kenya, E-mail: Kemrilib @ken.healthnet.org

KEMRI/RES/7/3/1

4th October , 2001

Dr. Maina Jane Wangeci
Kenyatta University
P. O. Box 43844
NAIROBI

Dear Madam,

RE: PROTOCOL NON- SSC "Utilization of HIV Post-Exposure prophylaxis in occupationally exposed Health Care Workers in Nairobi Province", by Maina Jane Wangeci et al

---

This is to inform you that during the 91st Meeting of the KEMRI/National Ethical Review Committee held of 2nd October, 2001, the above protocol was discussed. It was agreed that the protocol be granted approval for you to embark on your study.

G. A. O. SEKO
FOR: SECRETARY
KEMRI/NATIONAL ETHICAL REVIEW COMMITTEE

MINISTRY OF HEALTH

Tel: Nairobi 724712, 728530
When replying please quote

Ref. No.....and date.

Mbagathi District Hospital
P.O. Box 20725
NAIROBI

4th March ,2002.

TO WHOM IT MAY CONCERN.

RE: PERMISSION FOR JANE MAINA.

This is to certify that Dr. Jane Maina has been authorized to carry out research in this institution.

She is master of Public Health student at Kenyatta University.

Kindly give her the necessary co-operation.

Dr.A.Kigo.

FOR : MEDICAL SUPERINTENDENT.

Tel: 726300 - 10
726562 - 6
726450 - 9
726581 - 2
Fax: 725272

NAIROBI.

Email: *knh@healthnet.or.ke*

Ref: KNH-ERC/01/1209

15 November 2001

Jane Wangechi Maina
Kenyatta University
Dept. of Zoology
P.O. Box 43844
Nairobi

Dear Jane,

RE: RESEARCH PROPOSAL "UTILIZATION OF HIV POST EXPOSURE PROPHYLAXIS IN OCCUPATIONALLY EXPOSED HEALTH CARE WORKERS IN NAIROBI PROVINCE, KENYA" (P119/11/2001)

This is to inform you that the Kenyatta National Hospital Ethical and Research Committee has reviewed and approved your above cited research proposal.

On behalf of the Committee I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of data base that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Thank you.

Yours faithfully,

PROF. A.N. GUANTAI
SECRETARY, KNH-ERC

c.c. Prof. K.M. Bhatt,
Chairman, KNH-ERC,
Dept. of Medicine, UON.

Deputy Director (CS),
Kenyatta N. Hospital.

Supervisors: Prof. Alloys S.S. Orago, Kenyatta University
Prof. Romanus O. Okelo, Kenyatta University
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November 26, 2001

Dr. Jane W. Maina
Department of Zoology
Kenyatta University
P.O. Box 43844
NAIROBI

Dear Dr. Maina

Re: Authorization to Carryout Research on "Utilization of HIV Post-Exposure Prophylaxis among exposed Healthcare Workers in Nairobi"

We are in receipt of your proposal for study in this hospital.

This proposal has gone through the various stages of approval and we are pleased to inform you that you have the permission to carryout the study but you are required to furnish us with the name of a local supervisor, at this hospital before proceeding with the study. The following are the terms and conditions of the study:

1. This hospital will in no way be responsible for funding of this study.
2. No material belonging to the hospital e.g. files, diskettes, etc may be taken out of the hospital premises.
3. On completion of the study, a copy of the report will be presented to the hospital or the result of the study may be given in a lecture form to the medical fraternity in the hospital.
4. No part of the study may be published without written permission from the Aga Khan Health Services Kenya.

Yours sincerely,

Dr. M.M. Qureshi
Medical Director

Copy to: Chairman, Ethics Committee
Chairman, Education Committee

APPENDIX VI: ABSTRACTS FOR CONFERENCES/ WORKSHOPS/ SEMINARS

Availability Of Guidelines For Management Of Health Care Workers Potentially Exposed to HIV In the Workplace.

Jane Wangechi Maina*, Prof. Alloys S. S. Orago*, Prof. Romanus Okelo* and Dr. Monique K. Wasunna**.

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23rd African Health Scientific Conference: AFHES/ Makerere University. May 2002.Kampala Uganda.

The question of utilization of PEP services continues to provoke heated discussions, with some observers arguing that the value of PEP to HCWs does not justify its cost. Others correctly argue that it would contribute to unlearning of the already assimilated behaviour changes that took years to form.

This report presents preliminary results of a larger descriptive cross-sectional study that was set to establish the factors that influence the level of utilization of HIV post exposure prophylaxis among the occupationally at risk health care workers in Nairobi, Kenya. A representative sample of three hospitals was surveyed. Various statistical techniques were used to answer the research question: Do health care institutions in Nairobi have guidelines for management of potentially exposed HCWs?

Public health institutions did not have the PEP guidelines although the major ones, which are autonomous in their operations like Kenyatta Nattional Hospital, do have.

The findings provide further justification for PEP policy formulation enforcement and implementation in addition to providing HCWs with necessary communication, education and information regarding HIV PEP.