To the Graduate Council:

I am submitting herewith a dissertation written by Kenneth Martin Pearson entitled "A Study to Ascertain Law Enforcement Officers' Perceived Risk of Occupational Exposure to HIV and HBV." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education with a major in Health Education.

Robert J. Pursley, Major Professor

We have read this dissertation and recommend its acceptance

Bill C. Wallace

William A. Poppen

Jack S. Ellis

Accepted for the Council

Associate Vice Chancellor and Dean of the Graduate School

A STUDY TO ASCERTAIN LAW ENFORCEMENT OFFICERS' PERCEIVED RISK OF OCCUPATIONAL EXPOSURE TO HIV AND HBV

A
Dissertation
Presented for the
Doctor of Education
Degree
The University of Tennessee, Knoxville

Kenneth Martin Pearson

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DEDICATION

This dissertation is dedicated to my father (Dr. Randall Eugene "Hoss" Pearson), who inspired me to fulfill this dream, but was not able to see it to completion. His encouragement and wisdom served as my guiding light in completing this endeavor. His philosophy of hard work will be forever embedded in my way of life.

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I must express my gratitude to my mother, Milly Cunningham and her husband Oliver, for their support they have given me during the years it has taken me to complete this endeavor. Finally, I am most grateful to my family—my wife, Ellen, and my sons, Kaleb and Brandon, who put up with a contentious husband and father on a few occasions.

ABSTRACT

Police officers are exposed to many incidents that present varying degrees of occupational risk. Police officers expect to perform searches, experience assaults, handle evidence, and possibly render life-saving medical services. The population that engages in high-risk behaviors regarding bloodborne pathogens is over represented within the criminal justice system. Police officers are often confronted with the risk of transmission to the bloodborne pathogens human immunodeficiency virus (HIV) and hepatitis B (HBV) when dealing with this population. The purpose of this study was to identify the various factors that may influence Knoxville City law enforcement officers' perceptions of the risk of being occupationally exposed to HIV and HBV.

This study collected data describing 105 Knoxville police officers' demographics and then compared their self- reported level of perceived risk by using four hypothetical case scenarios. The instrument used for this study was developed through the review of a panel of experts and two pilot studies to obtain face validity. It consisted of a two-part questionnaire. The first part included questions about the officers' formal education, experience in law enforcement, training received concerning HIV and HBV, and HBV immunization status. The second part of the questionnaire consisted of four scenarios designed to have an increasing degree of occupational risk. The police officers recorded the degree of perceived risk they felt they would have in these four scenarios. The perceived risk levels were high, moderate, and low. The ordinal data were collapsed into working groups for each of the variables: formal education, training, experience, and HBV immunization status. The Somers'd (yx) association test for two ordinal variables

was used to address the research questions. Data were analyzed using SPSSX statistical software.

In conclusion, the investigator found that formal educational level influenced a police officer's level of perceived risk. The other independent variables of experience, training received, and HBV immunization status were not statistically significant. It was suggested in the literature review that education in the form of timely training could increase an officer's level of knowledge and alleviate many occupational fears of HIV and HBV.

Recommendations from this study included hiring officers with more formal education, which in turn could reduce the liability for a police department. The investigator also recommended offering training that compensates for the differences in the formal educational levels of officers. This would include targeting officers with lower levels of education for training intended to help them understand the actual risks of occupational exposure to HIV and HBV. Police officers are an excellent source of information for many high-risk populations, and accurate information concerning the behaviors associated with HIV and HBV may serve to educate many high-risk populations.

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Chapter 1

Introduction

Law enforcement personnel are on the front line in many emergency and crisis situations that require them to assume varying degrees of occupational risk. Police officers are aware of many occupational dangers they may face in the performance of their duties. The danger of possible occupational exposure to the bloodborne pathogens human immunodeficiency virus (HIV) and hepatitis B (HBV) is not clear in many cases. Since its identification in 1981, acquired immune deficiency syndrome (AIDS) has created much fear and misinformation, particularly within the criminal justice system. This fear can create misconceptions concerning the transmission of these diseases, which in turn can affect how an officer perceives the actual risk to occupational exposure in certain situations. This perception of risk can alter the way an officer performs his or her duties.

The Centers for Disease Control (CDC) reported 26,546 cases of AIDS for 1996 and 20,222 cases reported as of May 24, 1997 (*Morbidity and Mortality Weekly Report*, 1997). The CDC reported 3,644 cases of HBV for 1996 and 3,282 cases of HBV reported as of May 24, 1997 (*Morbidity and Mortality Weekly Report*, 1997). From 1982 through 1996, 5,876 Tennesseans with HIV have progressed to AIDS and have been reported. Of these persons, 2,630 are living with AIDS and another 3,958 reported with HIV since reporting began in 1992 (Tennessee Department of Health, 1997). Through 1996, an estimated 29.4 million worldwide had been infected with HIV, of whom approximately

8.4 million have developed AIDS (World Health Organization, 1997). On April 30, 1997, the Tennessee Department of Public Health for the Eastern Region reported 447 cumulative cases of AIDS and 438 cumulative HIV cases in Knox County. Estimates indicate 11,000 to 14,000 Tennesseans were HIV+ at the end of 1996 (Tennessee Department of Health, 1997). The actual number of people infected with HIV or HBV passing through this area who come into contact with law enforcement personnel can only be speculated.

Federal "Duty to Act" laws mandate all law enforcement personnel to provide a reasonable level of care to all who need emergency services. The courts have ruled against police departments that failed to train their officers adequately concerning bloodborne pathogens. Officers must often use their own discretion when dealing with a wide variety of offenders and suspects. Officers are aware of obvious risks, but the perception of risk that bloodborne pathogens represent can change according to the situation. Therefore, it is important to identify the level or degree of perceived risk law enforcement officers have regarding possible contraction of HIV or HBV through occupational exposure.

Some debate exists as to whether law enforcement officers have contracted HIV or HBV through occupational activities. A study by the FBI indicated that between 1981 and 1991 7 officers contracted HIV and 31 contracted HBV through occupational duties (Bigbee, 1993). The CDC did not consider these cases to fall within their guidelines of occupational exposure. The risk of occupational exposure to HIV and HBV is real when

law enforcement officers face assaultive behavior including bites, conduct searches, handle evidence, and perform CPR. This threat becomes more evident upon realizing that persons who engage in high-risk behaviors, possibly leading them to contract HIV and HBV, are probably over represented among suspects and offenders with whom law enforcement personnel deal daily. The overall rate of confirmed AIDS cases among the nation's prison population (0.52%) was more than seven times the rate in the general population (0.07%) (Brien and Beck, 1996). The United States has one of the highest rates of illicit drug use in the modern world (Hammet, Hunt, Gross, Rhodes and Moini, 1991). Intravenous (IV) drug users are frequent clients of the criminal justice system. In a study of Los Angeles County arrestees in 1989, it was estimated that about 14 percent of the criminal population were IV drug users (Hser, Longshore and Anglin, 1994). Correspondingly, criminally active addicts have been shown to be more likely than other addicts to engage in drug-related HIV- risk behaviors (Magurg, Rosenblum and Joseph, 1991). Offenders and inmates with HIV infection and AIDS are not uncommon. At a minimum, 4.6 percent of all AIDS cases in the United States have occurred among inmates (Hammet, Harrold, Gross and Epstein. 1994). Almost one in 10 deaths (9.7%) in American jails between July 1992 and June 1993 were AIDS related (Perkins, Stephan and Beck, 1995). Intravenous drug users represent the population that is most likely to place law enforcement officers at risk for exposure to HIV transmission.

The Occupational Health and Safety Administration (OSHA) in 1991 passed the Code of Federal Register 1910.1030, which recognized the importance of training when

dealing with possible occupational exposure to bloodborne pathogens and mandated such training. Education and training have been recognized as cornerstones of the criminal justice system's response to AIDS (Hammett, Hunt, Gross, Rhodes and Moini, 1991) since law enforcement personnel, by the nature of their jobs, assume such risks when they are on duty.

Many factors can affect a police officer's perceived risk in any situation. Obvious dangers such as guns and knives represent a different level of perceived risk than the obscure dangers that bloodborne pathogens represent. The perception of risk officers have toward these diseases may adversely affect the level and quality of services rendered during stressful situations. The ethics of the law enforcement profession require that officers provide the same level of care and degree of service to all individuals regardless of circumstances. The fear generated by the AIDS epidemic is real, and this fear can affect a law enforcement officer's response in the performance of his or her duties.

It is easy to record the number of occupational injuries as they occur, but not so easy when exposure to certain dangers do not show for weeks, months, or even years. Since there is not presently a vaccine to prevent HIV infection, and since some officers do not utilize the hepatitis B vaccine, preventive education aimed at increasing an officer's awareness appears the best way to reduce perceptions of fear and risk.

Statement of the Problem

A very limited amount of descriptive research appears to exist concerning police officers' perceptions of risk regarding occupational exposure to the bloodborne pathogens

human Immunodeficiency virus (HIV) and hepatitis B (HBV). The research problem under consideration was to identify various factors that may influence a police officer's perceptions of risk concerning occupational exposure to HIV and HBV, by utilizing common at-risk case scenarios. Identifying these factors was important so that quality training may be implemented to reduce fear and misconceptions that may affect an officer's delivery of services.

Purpose of the Study

The purpose of this study was to measure police officers' levels of perceived risk of occupational exposure to HIV and HBV. Case scenarios were used to determine whether the amount of formal education, HIV and HBV training received, experience, and HBV immunizations were significant factors in determining the officer's reported level of perceived risk.

Research Questions

1. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HIV?
2. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HBV?
3. Does an officer's amount of law enforcement experience influence his or her level of perceived occupational risk to HIV?
4. Does an officer's amount of law enforcement experience influence his or her level of perceived occupational risk to HBV?

5. Does the amount of an officer's HIV training influence his or her level of perceived occupational risk to HIV?

6. Does the amount of an officer's HBV training influence his or her level of perceived occupational risk to HBV?

7. Do HBV-immunized officers have significant differences in the level of perceived occupational risk to HBV compared to those who are not immunized?

Need for the Study

No known national database exists for this type of risk assessment, and having such information may assist in the development of training procedures commensurate with the level of risk perceived. The issue of liability concerning law enforcement personnel and offenders may center on the quality of services rendered during both routine and crisis situations. The issues of education and training are key factors in determining negligence on the part of the law enforcement personnel in emergency situations. The idea that knowledge of AIDS is inversely related to negative attitudes and fears surrounding the disease is supported by research findings. In 1987 Royse, Dhooper, and Hatch found that a greater level of knowledge about AIDS was significantly associated with a greater level of empathy and a lower level of fear of AIDS. This inverse relationship between knowledge and fear has been observed in both the health care and criminal justice fields (Gerberding, 1988; Laszlos and Ayers, 1986).

Assumptions

The assumptions of the study were:

1. The law enforcement officers sampled would be representative of those serving in the Knoxville Police Department.
2. The participants would answer all questions accurately and honestly.
3. The participants selected would agree to voluntarily participate in the study.
4. No communication would take place between the subjects during the completion of the instrument.
5. These case scenarios would adequately determine the level of occupational risk to HIV and HBV.

Limitations

1. Some elected participants may be unwilling to complete and return the questionnaire.
2. This study did not employ randomized techniques.
3. There was no control over the perceptions already formed by the subjects before the study regarding the various risks associated with the case scenarios.

Delimitations

1. The study was delimited to measuring perceived risk to two viruses, namely HIV and HBV, as measured by the case scenarios.
2. The study was delimited to currently active law enforcement officers serving in the patrol division on November 21 and 22, 1995, of the Knoxville Police Department.

Definition of Terms

Acquired Immunodeficiency Syndrome (AIDS)—a communicable disease caused by a retrovirus that compromises the human body's immune system.

Case Scenario—situations originally designed by the Department of Health and Human Services, the Public Health Service, and the Centers for Disease Control and published in *A Curriculum Guide for Public-Safety and Emergency Response Workers*.

Dependent Variable—for the purpose of this study, the variable measured by the reported degree of perceived risk to HIV and HBV within the case scenarios. The choices included high, moderate, and low.

Formal Education—an independent variable determined by the educational level marked by the officers on the questionnaire. These ordinal data were collapsed into the following categories: (1) high school, GED, and some college, (2) associates degree, (3) and bachelor's degree or better.

Experience—an independent variable determined by the amount of experience in law enforcement as recorded by the officers on the questionnaire. These ordinal data were collapsed into the following categories: (1) less than one year up to three years, (2) four to six years, and (3) seven or more years.

Hepatitis B (HBV)—a viral infection that affects the liver. The effects of the disease on the liver can range from mild (even inapparent) to severe or fatal.

Hepatitis B (HBV Immunization) —an independent variable determined by the response on the questionnaire asking if the officers had received any of the HBV immunizations. If the officers had received at least one of the shots, they were considered immunized.

Human Immunodeficiency Virus (HIV) Positive—the demonstration of antibodies to HIV-1.

Independent Variables—for the purpose of this study, demographics such as formal education, experience, HBV immunizations, and training received concerning HIV and HBV.

Occupational Exposure—exposure occurring during the performance of job duties that may place an officer at risk of contracting HIV or HBV infection as measured by the association between the dependent and independent variables identified in this study.

Law Enforcement Officer—a trained member (with civil service status) of a police force who is entrusted by Knoxville City with maintenance of public peace and order, enforcement of laws, and the prevention and detection of crime.

Perceived Risk—determined as the measure of the officers' recorded levels of perceived risk to the case scenarios used in this study: high, moderate, or low according to the four scenarios.

Risk—the likelihood or potential to cause harm.

Training—an independent variable determined by the open ended response on the questionnaire. The questionnaire asked the officers how many different series of training they received while in law enforcement concerning HIV or HBV. These ordinal data were collapsed into the following categories: (1) one to two training series, (2) three to five training series, and (3) six or more training series.

Summary

Chapter One explores the scope of the problem that occupational exposure to HIV and HBV represents to law enforcement personnel. The chapter explains how this study was undertaken and lists the research questions that were tested. Chapter Two includes a review of the epidemiology of HIV and HBV, an overview of some of the legal and political issues involved concerning occupational exposure to HIV and HBV, research of similar professions dealing with the same populations, and known risks of occupational exposure to these bloodborne pathogens. Chapter Three reviews the research design used to address the research questions. This includes the development of the survey through the review of a panel of experts and two pilot studies used to establish face validity. The chapter includes the methodology used in collecting the data and an explanation of how

the data were gathered and analyzed. Chapter Four analyzes the data in terms of which results were statistically significant. The chapter determines how the research questions were answered. Chapter Five includes the findings, conclusions, and recommendations based on the study. The chapter reviews all of the aspects that influenced the study and the findings. Chapter Six is devoted to the researcher's perspectives of the study and findings. The chapter includes recommendations for future studies and possible training techniques.

Chapter 2

Review of Literature

Several areas of research are relevant to AIDS and to the attitudes that law enforcement personnel may have concerning AIDS education. For the purposes of the study, this chapter has been divided into two sections. The first section contains a brief review of the medical aspects of AIDS/HIV and HBV as well as Tennessee and Knox County epidemiological characteristics of these diseases. This section will also review litigation issues that confront law enforcement personnel in their decisions concerning the administration of services to HIV-infected individuals within the occupational setting. The second section consists of a review of the studies concerning knowledge of AIDS pertaining to several related occupations. This section also consists of a review of studies of AIDS education as it relates to law enforcement occupations.

Medical and Epidemiological Aspects of AIDS

Acquired immunodeficiency syndrome (AIDS) is a disease caused by a retrovirus called human immunodeficiency virus (HIV). The virus causes the failure of the immune system to fight off opportunistic infections and retains tumors that may be malignant. As a result, the infected person may not die from AIDS, but rather from opportunistic infections such as pneumocystis carinii, Kaposi's sarcoma, and lymphomas. HIV is one of a class of retroviruses, so named for their ability to *reverse* the ordinary flow of genetic information within the infected cell (Gallo, 1988).

AIDS was first officially announced on June 5, 1981, by the Centers for Disease Control (CDC) in its weekly bulletin *Morbidity and Mortality Weekly Report*. The official use of the acronym AIDS began in the summer of 1982, as used by the CDC. The name suggests a clinical, not a pathological concept. AIDS is a pathologic state emanating from an infection with the HIV virus.

In 1983 and 1984, scientists at the Institute Pasteur in Paris and at the National Institutes of Health identified and isolated the causes of AIDS. The virus was first called lymphadenopathy-associated virus (LAV), or human T-cell lymphatropic virus type III (HTLV-III), because it was known to affect the white blood cells, called helper T-cells. These cells normally activate other cells to produce antibodies that will attack invading organisms. The AIDS virus invades these white blood cells, seriously impairing the body's ability to defend itself against infection.

Individuals who become infected with the virus go through four mutually exclusive stages. As identified by the CDC, the first stage often occurs within three weeks of exposure. The symptoms include fever, swollen glands, fatigue, and headache and disappear within weeks. During this stage the infected person testing positive with HIV antibodies is capable of transmitting the disease to others.

In the second stage of HIV (following the initial infection and after a positive test has identified the HIV virus), a person may remain asymptomatic for an undetermined length of time. In the third stage of HIV, a proportion of HIV-infected individuals with no other symptoms may manifest persistent swelling of the lymph nodes, or

lymphadenopathy. In the fourth stage of HIV, infected individuals begin to experience fever, diarrhea, and weight loss. This stage of infection has often been referred to as AIDS-related-complex (ARC); however, the term ARC is non-specific and tends to obscure the life-threatening aspects of this stage of AIDS (Laszlo and Ayers, 1986). The CDC also has an IV-B classification, which includes neurological cognitive disorders or one of the opportunistic infections such as pneumocystic carinii pneumonia and Kaposi's sarcoma. Fauci (1986) estimates that the number of persons with ARC symptoms is up to ten times greater than the number of persons with AIDS.

The CDC reports that as of June 1997, the total number of reported AIDS cases was 476,899. It is projected that most of those affected in the future will be heterosexual females, homosexual and bisexual men, and IV drug users and their sexual partners.

Surveillance

The surveillance definition, or when HIV+ becomes AIDS, was broadened on January 1, 1993, to include HIV infection with laboratory evidence of severe deficiency of the immune system, as determined by a CD +AT- lymphocyte (white cells) count of fewer than 200 cells per microliter. The broadened definition also added invasive cervical cancer, recurrent bacterial pneumonia, and pulmonary tuberculosis when found in persons who also are infected with HIV. The expanded definition was expected to nearly double the number of new AIDS cases reported in the first year, with small increases thereafter. The long-term main effect of this broadened definition has been to include individuals

earlier in the course of their HIV infection, thereby sharply increasing the reported figures.

Tennessee

As of June 30, 1997, an estimated 6,714 persons who tested HIV+ had progressed to AIDS, as reported by the Tennessee Department of Health. An estimated 12,000 Tennesseans (1 in 425) were HIV+ by the end of 1994. The Tennessee Department of Public Health estimated that by the end of 1996, 11,000 to 14,000 persons (1 in 275) would be HIV+. The reported AIDS rate in 1995 for Tennessee was 17.1 cases per 100,000, up from a rate of 14.5 in 1994. During that period the overall national average declined 7 percent, with Tennessee showing one of the largest increases.

Knox County

As of April 30, 1997, the Tennessee Department of Health reported 447 confirmed cases of persons testing HIV+ in Knox County. Reported cases for the city of Knoxville per 100,000 population from July1994 to June 1995 was 14.1 (CDC., 1996). This figure reflects only actual reported cases, not those who are infected but do not know it.

Future

The future course of the worldwide HIV epidemic cannot be accurately predicted. An estimated 40 million people worldwide will be infected by the end of the decade (World Health Organization, 1997). According to the World Health Organization, an estimated 2.5 million people worldwide have developed AIDS, and an estimated 14

million people, one million of these Americans, have been diagnosed with HIV. According to Dr. James Curren, director of the federal AIDS project, 5 percent or more of those infected with HIV will develop AIDS annually.

Hepatitis B

Hepatitis is a major health problem worldwide and poses a definite risk of occupational exposure to public safety personnel. Hepatitis is a major contributor to cirrhosis of the liver and to liver cancer.

Hepatitis B was first identified as a causative agent of acute hepatitis and chronic liver disease in 1967. It appears to be an etiologic factor in primary liver carcinoma. Worldwide, hepatitis B is a leading cause of adult mortality, with an estimated 200 to 300 million carriers (CDC, 1992).

Since it became available in 1982, hepatitis B vaccine has been a powerful weapon in the fight to prevent occupational exposure to this disease. The vaccine has a strong record of safety and efficacy with no major problems reported concerning this vaccination. Hepatitis B is transmitted by exposure to body fluids through blood transfusions, needlestick injuries, bites, sexual contact, intravenous blood use, and perinatal transmission. Carriers and persons with acute infection have the highest concentrations of HBV in blood and serous fluids. This disease is particularly noticeable among people whose occupations bring them into contact with infected blood, blood products, or other body fluids such as saliva or semen. The virus can live in dried form on environmental surfaces for at least seven days. Public safety personnel should be

provided with this vaccine at no cost. It is estimated that 300,000 cases of hepatitis occur in this country per year and that 20,000 health care providers develop hepatitis B each year. Approximately 200 health care providers die each year as a result of the hepatitis B viral infection (*Morbidity and Mortality Weekly Report*, 1993).

The federal government's viewpoint concerning occupational exposure to bloodborne pathogens has been established with the goal objectives published in the *Healthy People 2000* report. The goals of *Healthy People 2000* focus on increasing the use of the hepatitis B vaccine to 90 percent and reducing the incidence of occupational exposure to no more than 1,250 cases (Department of Health and Human Services, 1990).

Knox County

As of July 18, 1997, the Tennessee Department of Public Health reported 12 confirmed cases of HBV in the Knox County area. In 1996, 27 confirmed cases were reported in this area. In Tennessee, as of July 5th, 1997, 234 cases of HBV were reported, compared to 488 total cases for all of Tennessee in 1996. The CDC reported 1,342 cases for the entire United States for the year of 1995, but estimates at least 240,000 people will become infected with this disease (*Morbidity and Mortality Weekly Report*, 1995).

Liability Issues Facing Public Safety Personnel

Public safety personnel are often exposed to a wide variety of occupational risks. These risks have led to laws, regulations, and national standards that address these issues. Infection control laws, standards, and regulations include:

1. U.S. Congress (public law).

2. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA).

3. International Association of Chiefs of Police (IACP).

Ensuring compliance as well as providing employees with proper training for dealing with bloodborne pathogens are important steps in infection control. The possibility of major litigation involving AIDS and public safety personnel is growing rapidly. While such regulations vary from jurisdiction to jurisdiction, the most common ones are:

1. Duty to act- laws requiring emergency response personnel to provide a "reasonable level of care" to all patients.

2. Patient abandonment - laws specifying that patient care may only be relinquished to someone having an equal or higher level of medical expertise.

3. Biohazard waste - laws governing the storage, handling, and disposal of medical waste.

Public Law

The Ryan White Comprehensive AIDS Resources Emergency Act of 1990 (PL 101-381) delineates specific notification requirements that allow emergency-response personnel to find out if they have been exposed to an "infectious disease" while providing care. The issues of confidentiality regarding a person known to have AIDS, versus the right to know of public safety personnel, is well documented.

In *Doe v. Borough of Barrington* (1990), the court ruled against Barrington police officers for violating Doe's civil rights—specifically to the constitutional right of privacy. At the time of a prior arrest, Mr. Doe had informed the police that he had tested HIV+. When Mr. Doe was later involved in an auto accident, the same police officers revealed to other police officers at the scene that Mr. Barrington was HIV+. The court stipulated that the officers had a duty to keep AIDS information confidential, barring them from informing anyone other than the patient and his or her immediate family. [It should be noted that this suit was brought under 42 USC 1983, which by its terms applies only to governmental agencies and employees of governmental agencies.]

In a similar case, the court in *Estate of Behringer v. Princeton Medical Center* (1990) held that the medical center breached its duty of confidentiality by failing to take reasonable precautions to prevent an AIDS diagnosis from becoming public. The court noted that a patient "must be able to secure medical services, without fear of betrayal and unwarranted, embarrassing, and detrimental disclosure" (592A.2d 1251, 1268). The court takes the stand that confidentiality regarding AIDS is a constitutional right and those violators will be held accountable. The pervasive theme for public safety personnel is that, once they accept a call and arrive on the scene, a sufficient special relationship is formed, requiring the responders to treat all patients found at the scene. This is true regardless of whether the patient is a known or suspected AIDS carrier. Emergency medical providers, which include law enforcement personnel, are required by the

Rehabilitation Act of 1973 (which prohibits discrimination against individuals solely based on a handicap) to respond and provide services when requested.

Persons testing positive for HIV fall within the protection of the Ryan White Act. These regulations and court cases typically dictate to public safety personnel what is expected of them when rendering services. The view of AIDS issues through the eyes of the law, however, often removes the human factor. A potential exists for much litigation within the public safety domain concerning law enforcement response to AIDS carriers. Those responding to medical emergencies are, first and foremost, providers of health care and not judges of those whom they are called to help.

The risks of occupational exposure to HIV have been strongly influenced by OSHA regulation 29 CFR 1910.1030, Occupational Exposures to Bloodborne Pathogens (see Appendix A). This regulation was released on December 2, 1991, and the final rule affects public safety personnel. The final rule established standards for workplace protection from bloodborne pathogens. OSHA guidelines require specific training guidelines to educate employees about occupational exposure to bloodborne pathogens. Personnel knowledgeable in the subject matter must provide training at no cost during working hours. The hepatitis B vaccination must be available within ten working days of the employee's initial assignment involving occupational exposure. The vaccination is voluntary and requires three injections of the vaccine at least two months apart. The OSHA guidelines are clearly stated in performance terms: "Ensure that all employees understand the hazards...so that employees accept and follow established safety and

health precautions" (Department of Labor, 1991). These regulatory mandates are not designed to motivate employees, but to educate them about the serious effects of occupational exposure to bloodborne pathogens.

Studies of AIDS Knowledge and Attitudes

This section includes research concerning occupational exposure of law enforcement personnel and related professions. The research on law enforcement is reviewed since it relates to similar occupations working with the same personnel, including corrections, probation, and parole personnel.

Review of Related Literature

The occupational exposure regarding the possibility of HIV transmission through accidental contact with contaminated blood is of concern to professionals within the health care, emergency medical services, and public safety fields. However, numerous studies have confirmed that such transmission represents a small occupational risk. Approximately 4.4 million health care workers in the United States receive an estimated 800,000 needlestick and other injuries from sharp objects annually (Jagger and Pearson, 1991). It was estimated that 16,000 of these objects are contaminated with HIV and that HIV is transmitted by approximately 3 of every 1000 HIV- contaminated needlesticks. Although studies indicate that the estimated risk for HIV infection after a percutaneous exposure (through the skin) to HIV infected is approximately 0.3 percent, factors influencing this risk have not been determined (*Morbidity and Mortality Weekly Report*, 1995). In a national study conducted by the CDC of 870 health care workers who

accidentally received needlestick injuries or cuts with sharp objects and were exposed to blood from patients known to be HIV infected, four tested positive, yielding a seroprevalence (ratio of positive to negative) rate of 0.47 percent (CDC and National Institute of Occupational Safety and Health, 1989).

In an effort to assess potential risk factors, the Centers for Disease Control, in collaboration with French and British public health authorities, conducted a retrospective case control study using data reported to national survelliance systems in these countries. This case study focused on health care workers who had a documented occupational percutaneous exposure to HIV- infected blood and no other exposure to HIV and were HIV seronegative (testing HIV negative) at the time of the exposure and at least six months later. The study included all health care workers in the United States whose exposure occurred during January 1988- August 1994. Information collected about these exposures included the type of device involved, gauge of hollow- bore needle (diameter of the inside of the needle), type of procedure being performed, whether the procedure was an emergency, use of gloves, time from the exposure, presence of visible blood from the source patient on the device, and severity of the injury (*Morbidity and Mortality Weekly Report*, 1995). These findings indicated an increase risk for HIV infection following percutaneous exposure was associated with these factors: the risk increased with the larger amount of blood as indicated by (1) a device visibly contaminated with blood, (2) a procedure that involved a needle directly in a vein or artery, or (3) deep injuries involving deep needlesticks. It was found that risk of HIV infection is reduced

with the use of zidovudine (drug used to fight off HIV virus) and that a low rate of HIV seroconversion (changing from positive to negative) following health care workers' occupational exposure to HIV was indicated in this 1995 study.

In an effort to assess the nature and frequency of blood contact to emergency medical workers during an eight-month period, an interview process was established for the study. Interviews were conducted after the workers returned from emergency transport calls. During 165 shifts 2,472 patients were attended and the workers reported 61 contacts with blood and one needlestick. These interviews were conducted in three cities with high AIDS- incidence rate. The estimated annual frequency of blood contacts for emergency medical service workers at the study sites was 12.3, including .2 percutaneous exposures (Srivastava, Bell, McKibben, Kelen and Zalenski, 1995). This study concluded the transmission of the HIV virus is unlikely, since most exposures were blood to skin contacts, but concluded that the practice of universal precautions was imperative for these workers.

In another study by the National Institute of Health (NIH), 983 health care workers were tested, 137 with documented needlestick injuries and 345 with mucous membrane exposures to blood or other body fluids of HIV-infected patients. Only one of these subjects tested positive for HIV.

Studies by Gerberding (1988) cite the risk of acquiring HIV infection from needlesticks to be 0.03 percent. The studies included a variety of public and safety

personnel who were involved in needle injuries. These needle injuries were grouped into three categories:

1. Minor—stick or scrape with a needle.
2. Significant—deep muscle stick.
3. Major—deep muscle stick with injection of body fluid.

In all the studies of health care workers who have HIV+ readings as the result of needlestick exposures, the exposures were noted in the major category. It has been reported 46 health care workers are HIV+ as the result of occupational exposure, with 97 possible HIV+ *(Morbidity and Mortality Weekly Report,* 1995). One paramedic in this group was placed in the "undetermined" category because of inadequate documentation and medical follow-up. It is presumed that other cases have occurred but remain unreported.

The majority of studies concerning needle incidents are related primarily to contaminated needle injuries. In cases involving a single stick with a hollow-bore needle that had contact with infected blood, the infection rate is estimated to be about 0.5 percent, or 1 in 200 (Marcus, 1988).

The risk of acquiring hepatitis B is a much greater concern for public safety personnel when needlestick injuries occur. Persons stuck with an HBV-contaminated needle have a 6 to 30 percent chance of developing a hepatitis B infection *(Morbidity and Mortality Weekly Report,* 1993*)*. HBV clearly presents a much greater risk than HIV regarding needlestick injuries.

In an effort to determine the means by which criminal justice professionals can identify HIV infection risks among IV drug users, this problem was researched by gathering data from face-to-face, structured interviews conducted between August 1994 and February 1995 (Tewksbury, Cummings and Vito, 1995). The interviews lasted between 15 and 45 minutes, with all interviews being voluntary and anonymous. The sample included 68 IV drug users, 61.8 percent of whom reported they knew someone (either living or dead) with HIV/AIDS. The study concluded that three risk factors put IV drug users at significantly increased risk of contracting HIV and transmitting to others:

1. High rates of high-risk sexual activities.
2. Negative attitudes regarding HIV risk-reduction activities.
3. Low levels of knowledge concerning HIV, coupled with accessibility to and trusts in information sources of questionable value (Tewksbury, Vito and Cummings, 1995).

This study further supported the belief that IV drug users may be the most likely population to be at risk for (and already infected with) HIV. The authors also concluded that criminal justice practitioners might be uniquely equipped to provide this high-risk population with education about HIV and its prevention.

Two studies from the National AIDS Demonstration Project (NADP) funded by the National Institute of Drug Abuse (NIDA) have revealed dramatic information about the linkages between intravenous drug users (IDUs) and HIV. The purpose of this project was to reach street drug users who were not in treatment and to develop and test AIDS

prevention activities aimed at reducing high-risk behaviors for HIV infection. For example, a study of 413 street IV drug users in Miami, Florida, found that half of the group who injected drugs at least four times per day were seropositive for HIV antibodies. The majority of this group had been incarcerated in the last five years. Although some of them (13.5%) reported that they had obtained AIDS information in jail, few were exposed to AIDS prevention programs or received treatment services during their incarceration (McBride and Inciardi, 1990).

The CDC transmission statistics show that many persons do not have simply one possible or likely means of becoming infected with HIV. To assume that IV drug users are at risk only from their needle use would be foolish. Instead, such individuals must be viewed as having many risks due to IV drug use.

A study based upon a sample of 879 midwestern IDUs who were not in treatment revealed a number of variables that were significantly related to the amount of time spent in jail. The variables found were: (1) initiation to drug injection at an early age, (2) having multiple sex partners, (3) having a history of sexually transmitted diseases, (4) being a daily drug user, (5) daily injection of cocaine, heroin, or "speedball," (6) inconsistent use of condoms, and (7) using rented needles (Siegal, Wang, Forney, Falck, Carlson and McBride, 1994). In addition, the most active IDUs with the highest HIV-risk behaviors were those most likely to spend time in jail.

Both studies concluded that the criminal justice system was the most logical place to initiate HIV prevention services for IDUs. This system is the point of contact for

access to one of the highest risk populations of HIV/AIDS (McBride and Inciardi, 1990; Siegal et al., 1994).

Risks

Police officers are accustomed to facing certain risks during routine performances of their duties, but there have been instances of criminal justice personnel declining to perform their duties due to fear of HIV contraction (Hammett, 1989). The risks that law enforcement officers face include exposure to bloodborne diseases such as HBV and HIV. The Department of Labor has recognized the importance of defining what constitutes exposure, using the following criteria:

1. A contaminated needlestick injury.
2. Blood or body fluid contact with mucous membrane surface of the mouth, eye, or nose.
3. Blood or body fluid contact with an open area of the skin.
4. Cuts with sharp objects covered with blood or body fluids (Department of Labor, 1991).

This information should be given to police officers as federal guidelines mandate training concerning bloodborne pathogens.

HIV has captured the attention of the media and is perceived as the greatest risk among bloodborne pathogens. In reality, however, this is not the case. Hepatitis B poses more of a threat to police officers through occupational exposure than HIV. The hepatitis B vaccine has a strong record of safety and efficacy, with no major problems reported in

the literature since its introduction (Handleman, 1992). According to studies required for licensure of the vaccine, over 95 percent of the young adults tested developed protective antibodies following administration of the vaccine (CDC., 1987).

The vaccine offers at least some hope for controlling the actual risk as perceived by officers during the performance of their duties. Their perceived risk may be strongly influenced by whether or not they have been vaccinated. The threat of obtaining HIV through occupational exposure is much less a reality, but the fatal nature of this disease may greatly influence officers' perceived risk in crisis situations.

Perceptions of risk appear to be a product of the kind of society in which we live. A complex mixture of scientific, social, legal, political, and psychological influences appear to be contributing factors to perceptions of risk. The perception of risk that people have varies from experts, who view risk as annual mortality, to the general public, which is swayed by media and cultural exposure.

Correctional Facilities

In reviewing the literature, various studies were examined concerning the level of knowledge of HIV and attitudes about AIDS education. The studies directly relate to law enforcement officers because more than likely they encountered these offenders before they entered into the correctional system. It is also a common practice for police officers to work within the jail or correctional settings. Brien and Beck of the U.S. Department of Justice Bureau of Justice Statistics reported in 1996 that between 1991 and 1994, the number of HIV+ inmates grew a little faster (29%) than the overall prison population

(26%). They also reported 955 AIDS related deaths in 1994, comprising over a third (35.1%) of all state prisoner deaths during the year. The number of prison inmates with confirmed AIDS has nearly tripled since 1991, 1,682 to 4,849. They also found the rate of death from AIDS is about three times higher in prison than the general population for ages 15 to 54. In an effort to assess the actual spread of HIV within correctional institutions, the National Institute of Justice (NIJ), in conjunction with the American Correctional Association (ARC), has surveyed all 50 state prison systems, the Federal Bureau of Prisons (FBOP), and more than 30 large county and city jail systems to determine the number of inmates who have been diagnosed with stage four, or the last stage of AIDS, for 1986-88 (Hammett 1986-8).

The survey in 1988 revealed from 1986-1988, a cumulative total of 1,320 confirmed AIDS cases in 39 state and federal correctional systems. In addition, 31 large city and county jail systems reported a cumulative total of 644 cases of AIDS among inmates. The survey responses from the United States revealed a total of 1,964 correctional AIDS cases. Inmate cases have increased 156 percent since the second survey in 1986. According to questionnaire responses, as of October 1987 there were 295 current cases of AIDS among state and federal inmates in 39 systems and 126 current cases among city and county inmates in 31 systems. A 1989 study by Hammett of Illinois prisons revealed that 4 out of every 100 adult male prisoners might be infected with HIV. The majority of correctional AIDS cases are believed to be associated with intravenous drug use.

The distribution of AIDS cases among correctional systems is quite uneven. More than 70 percent of state and county systems had fewer than ten cases (Hammett, 1988). At the other extreme, four state and federal systems (8%) had 73 percent of the cases in those systems and four of the responding city and county systems (12%) had 67 percent of cases in those systems (Hammett, 1988). Epidemiological data indicates that between 50 percent and 60 percent of IV-drug users in New York City and New Jersey are seropositive as compared with a rate of less than 5 percent in most other sections away from the East Coast (CDC, 1987).

AIDS incidence rates are becoming higher in the correctional setting, which is an expected change due to the higher concentration of high-risk group members (particularly IV- drug users) in inmate populations than in the population at large (Hammett, 1988).

The 1988 survey indicated that at more than one-half of the responding correctional systems staff concern regarding AIDS had increased in the past year. Staff perceived contact with inmates to be more than "casual" (sneezing, coughing, breathing, hugging, handshaking, sharing eating utensils, using the same toilet facilities, or any other form of non-sexual contact activity) and therefore they reported worrying about becoming infected on the job. Correctional officers said they were especially concerned about being infected when aggressive inmates bit them, spit in their face, threw urine or feces on them, or jabbed them with sharp instruments. Such incidents are not uncommon in correctional facilities. Staff were also found to be concerned about risks involved in breaking up fights among inmates and providing CPR and other first aid to inmates.

These concerns about exposure to HIV have led staff in some jurisdictions to refuse to help inmates who have AIDS or test positive for HIV (Hammett, 1988). However, findings from three successive NIJ surveys in 1985, 1986, and 1987 indicated there have been no known cases of AIDS, ARC, or HIV seropositivity reported within a correctional setting as a result of inmate interaction. Neither have there been any job-related cases of infection among police officers, firefighters, emergency medical technicians, or any other public safety workers.

In 1990 the National Institute on Drug Abuse funded an education and risk assessment project in 63 cities to determine the effectiveness of an AIDS-education program for inmates. The project employed a pretest/post-test experimental design, with random assignment of participants to an education (treatment) or comparison (control) group, using a six month follow-up as administered by mail questionnaire (Baxter, 1991). It was concluded that jail-based education programs offer an excellent opportunity to educate high-risk populations.

In 1990 the Pennsylvania Department of Corrections conducted a study measuring AIDS knowledge and risk perceptions of Pennsylvania prisoners, using the Centers for Disease Control curriculum guide and questionnaire. The study consisted of giving a pretest/post-test questionnaire, based on an AIDS educational program, to 715 randomly selected inmates. It was concluded that 64 percent of the sample surveyed felt they were at some risk of infection due to drug use. A multiple regression analysis was performed to identify important correlations of differences in inmate knowledge levels concerning

AIDS. This study concluded that for many prisoners, prison offered an opportunity to receive AIDS education they would not acquire in the community. The conclusion was that prison confinement provides an unprecedented opportunity for educating a population of high-risk individuals (Zimmerman, Martin and Vlahou, 1991).

In 1988, Diclemente and Zorn compared the data of high school students to that of incarcerated youths in San Francisco concerning a CDC surveillance survey of adolescents' knowledge, attitude, and risk behaviors toward the acquisition of AIDS. Incarcerated youths compared to high school students favorably with a similar level of AIDS knowledge, although they were less likely to be knowledgeable of prevention strategies and were more likely to engage in risky behavior. The finding indicated an urgent need to implement effective AIDS prevention programs for high-risk youths. This study suggested targeting newly incarcerated youths for AIDS educational programs. The study used pretests and post-tests over time to evaluate the programs.

The National Institute of Justice (1987) survey indicated that inmate' concerns about AIDS are not decreasing in most correctional systems. Some inmates have reacted to the problem by demanding HIV antibody testing of all inmates, refusing to take work assignments involving contact with HIV-infected inmates or their belongings, demanding that positively tested inmates or homosexual inmates be excluded from food service assignments, and calling for segregation of all high-risk inmates. There also have been instances of threats and actual violence against inmates with AIDS, ARC, or asymptomatic HIV infection (Hammett, 1988). The reported reactions among staff and

inmates reflected a serious misunderstanding of the documented means of HIV transmission. Education and training programs play a key role in counteracting misinformation and rumors.

Accurate information and prevention of HIV transmission in prisons and jails were suggested as serious criteria for all jails and prisons. The majority of the research suggested that educational programs within a correctional environment offered the best way to educate a large number of offenders engaging in high-risk behavior.

Probation and Parole Professionals

In a 1990 study involving the assessment of educational HIV seminars for probation and parole officers, the results were similar for both professions. The 254 officers completed a pre- and post-test questionnaire assessing medical and legal knowledge about HIV and fear of HIV. The study indicated that a single educational seminar is an effective tool for increasing probation and parole officers' knowledge about HIV and diminishing their fears of the virus (Lurigio, Petraitits and Johnson, 1991). The researchers in this study suggested it was imperative to include both medical and legal topics in such a seminar. The HIV curriculum should tip the balance in favor of legal issues.

Law Enforcement

To perform their duties effectively without fear, law enforcement personnel should understand how the transmission of such viruses as HIV and HBV occurs. Research shows that fear and misinformation can drastically affect an officer's perception

of risk and possibly the quality of service rendered during job-related duties. Common concerns involving searches, assaultive behavior, bites, evidence handling, CPR, and body removal bring about a degree of risk involving the officers' perception of that risk.

A 1994 survey of 49 state policy-training academies found that 86 percent offered training regarding possible HIV occupational exposure to their recruits. These training procedures differed greatly in context, with fewer than half of these academies offering specific training in how to deal with persons suspected of or known to have HIV/AIDS, even though national standards by the International Association Chiefs of Police (IACP) (see Appendix B) and the Occupational Health and Safety Administration have existed for years (Edwards and Tewksbury, 1994). The study concluded that, although training and OSHA have mandated course content developed by the IACP, little has been done to ensure compliance by city, state, or federal agencies.

Another study in 1994 by Barr and Warshaw found that law enforcement agencies could benefit from HIV/AIDS education programming. This research focused on worksite AIDS education for New York City police officers, who regularly are in situations where occupational exposure to HIV is common because of the density of high-risk offenders. What quickly became apparent from these efforts was that the law enforcement community needed to become involved in the HIV/HBV issues, given the likelihood of one or more of the following legal issues arising:

1. Departmental liability for job-related infection of officers.

2. Departmental responsibility for preventing the spread of HIV infection by and among prisoners.

3. Potential for criminal charges stemming from negligent or intentional infection.

In 1992, front-line law enforcement officers in Durham, North Carolina, were questioned to determine the relationship between their knowledge about AIDS and HIV infection, fears about contracting AIDS during their work, and negative attitudes toward AIDS and people with AIDS (Yearwood, 1992). The results from the 41-item questionnaire indicated that, although officers may have an adequate understanding of AIDS, misconceptions about how the disease is transmitted still persist. These misconceptions concerned the probability of contracting the virus through routine occupational tasks and the exact methods and body fluids by which HIV is transmitted (Yearwood, 1992). The research concluded that:

1. Comprehensive educational training sessions could dramatically reduce the possibility of failure to perform duties.

2. AIDS-wise officers are not as likely to alter their work performance negatively; therefore, the officer's operational effectiveness and efficiency would not be compromised.

In 1989 the Police Executive Research Forum (PERF) conducted a telephone survey of 35 law enforcement agencies of various sizes, in different geographical regions,

and with differing levels of experience with AIDS. (Hammett, 1989). Nearly all (33 of 35) of the departments surveyed reported that their staff had expressed some concern related to AIDS. Despite the concern about AIDS, no department reported any job-related AIDS cases among any law enforcement officers or other staff (Hammett, 1989). The study found that an inverse relationship existed between departments and jurisdictions with few AIDS cases and actual experience with the disease. Knowledge and experience tended to calm unrealistic fears about AIDS. Nearly all departments surveyed by PERF attributed officers' concerns about AIDS to media coverage. This suggests the importance of departmental training concerning AIDS education.

In a 1991 study designed to determine how to educate criminal justice executives and managers, a three-day seminar introduced these professionals to the causes and the mode of transmission of HIV, including the effects and implications of state and federal court decisions. The effect of knowledge and attitudes was measured by a pre- and post-test instrument and followed up after with a three-month later mailed questionnaire requesting evaluation of the seminar. The participants at the AIDS-training sessions showed an increase in their knowledge about AIDS, which was reflected in their decisions for determining policy development. The study found that many of the attending managers changed their policies after attending this seminar (Laszlo and Smith, 1991).

The CDC has not reported any law enforcement personnel contracting AIDS or HBV through occupational exposure to these diseases. However, this was not the case in

a survey conducted by the Federal Bureau of Investigation (FBI) starting in 1989 and ending in 1991. The FBI concluded through this survey that seven police officers acquired AIDS occupationally between 1981 and 1991, with the following methods of contracting the disease: three absorbed infected blood through cuts, wounds, or scrapes on the skin; two received needlestick injuries; one received a tainted blood transfusion; and one contracted AIDS under undescribed circumstances (Bigbee, 1993). This survey concluded that a total of 31 officers acquired hepatitis B occupationally between 1981 and 1991 under these circumstances: 8 absorbed infected blood through cuts, wounds, or scrapes on the skin; 2 received needlestick injuries; 6 were bitten by infected suspects; and 11 contracted the disease under undescribed circumstances (Bigbee, 1993).

It was clearly evident that the term occupational exposure was expanded in the FBI survey. The FBI allowed the reporting agency to determine whether the case constituted an occupational transmission. The FBI, in most cases, considered occupational exposure to exist if the employee filed a workers' compensation claim and the agency accepted it. The survey may not have included all cases of AIDS or hepatitis B transmitted to police officers in the line of duty, since in some jurisdictions strict confidentiality and privacy laws prohibit the disclosure of certain diseases. The CDC was quick to point out that the agencies involved could not prove the officers were not infected off-duty. This survey, therefore, cannot be considered scientifically valid.

In 1991 the Ohio State Highway Patrol conducted a survey to determine the risk of transmission of HIV and HBV. This study determined that its officers were exposed to

blood or bodily fluids numerous times with some instances being prolonged during emergency situations. The risk was determined high enough to push the importance of the vaccine to prevent HBV. The study explored the vaccine's cost effectiveness and concluded that vaccination supersedes cost when risks are a valid concern (Ohio State Highway Patrol, 1991). They concluded that officers had a much higher risk of being exposed to hepatitis B than HIV during the performance of their duties.

The Florida Department of Law Enforcement in 1992 surveyed officers to determine what situations put them at the greatest risk to acquire HIV or HBV through occupational exposure. They indicated spitting, biting, cardiopulmonary resuscitation, contact with blood or body fluids, and needlesticks were the most common situations. It was determined that possible needlesticks from HIV drug users were the greatest threat to a police officer. They concluded that safety procedures could reduce the risk to a minimum, closing with the fact an officer has a much greater risk of being shot. The finding suggested adequate training, effective standard operating procedures, and appropriate medical equipment are the keys to reducing risks through occupational exposure to bloodborne diseases (Muffler, 1992).

The approach of education as the vital component in reducing fears for police officers concerning risks of contracting HIV and HBV is dominant in the literature. In 1993 an informal survey of 70 law enforcement administrators, managers, and trainers indicated that necessary procedures in training should include as topics clear goals, objectives, definitions, high-risk exposure situations, exposure protections,

decontamination methods, management of exposures, ethical issues, and health precautions (Steward, 1993). It was generally found that present training was not being followed as it related to current policies and procedures. The survey showed the training was not as complete as the policy would indicate. Final recommendations focused on the importance of education and training as the key to preventing many liability related court situations.

Summary

Research strongly recommends further evaluation of the current AIDS educational programs for all law enforcement professions. All research reviewed suggested the need for further evaluation and assessment of current as well as future educational programs. As the number of persons infected with HIV and HBV increases, so will the opportunities for possible occupational exposure to law enforcement personnel. The research clearly establishes the need to educate law enforcement officers concerning the possible occupation transmission of the viruses HIV and HBV. Law enforcement officers are a very important source of information for the general public and may prove to be the best source of information for people who practice high-risk behaviors for contracting AIDS.

Chapter 3

Methodology

This chapter addresses the specific methodology employed in answering the research questions. The methodology included the sample, instrumentation, panel of experts' review, two pilot studies, data collection procedures, and analysis of data.

Sample

The sample for this study consisted of 117 officers, with a response rate of 90 percent with 105 officers completing the survey. These subjects volunteered to participate in the study. The sampled population was Knoxville City Police patrol officers. The population included N=99, or 94 percent male, and N=6, or 6 percent female. Gender was not treated as an independent variable for the purposes of this study. This method will only allow for generalization to the population of Knoxville City law enforcement personnel.

Instrumentation

The survey instrument consisted of two distinct sets of questions, with the first part of the questionnaire designed to gather information pertaining to the officers' demographics: formal education, experience, and training received pertaining to HIV and HBV. These questions were designed to produce descriptive statistics.

The second part of the survey consisted of four case scenarios designed to place law enforcement personnel in common situations where possible occupational exposure

to HIV and HBV existed. The participants were asked to read the scenarios and respond to a scale that represented their perceived risk of occupational exposure to both HIV and HBV in such situations, with these risk levels being high, moderate, and low. These scenarios were obtained from the *Curriculum Guide for Public Safety and Emergency Response Workers - Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus* originally designed for training purposes. Scales were added to measure the officers' perceived risk to occupational exposure to HIV and HBV for all four scenarios. These scenarios were designed by the National Center for Health Statistics. Interagency working groups have established an information, education, and risk-factor reduction subcommittee of the Public Health Services Executive Task Force on AIDS to assist in the development and assessment of the content of these scenarios. The working groups included representatives from the Centers for Disease Control; the National Institutes of Health, Alcohol, and Drug Abuse; Mental Health Administration; and the National Center for Health Statistics.

Panel of Experts' Review

To establish the content validity of the instrument for this study, a panel of experts was selected to review the instrument. The panel consisted of Dr. Barry Freider, a practicing physician in Knoxville; Dr. Richard Tewkesbury, an assistant professor (Ph.D.) in criminal justice at the University of Louisville and a member of the Kentucky Law Enforcement Task Force on AIDS Prevention; Dr. Larry Miller, a professor of criminal

justice for East Tennessee State University with a Ph.D. in Health Education; and Frank Bristow, the State Region/AIDS Surveillance Program Coordinator.

Each panel member was initially contacted either through a personal visit or by telephone to request his service on this panel. A follow-up letter; a portion of the first chapter explaining the purpose of and need for this study; a copy of the instrument; and a stamped, self-addressed envelope were sent to each panel member (see Appendix C). Panel members were asked to determine if the instrument was appropriate for this study (see Appendix D). Each member was asked to make suggestions regarding adding to or subtracting from the instrument or study. The panel suggested using one question to establish the independent-variable experience by including total years in law enforcement instead of limiting officers to their experience with the Knoxville Police Department. The panel indicated that the independent variables would have to be collapsed into three categories to assist with the gathering of ordinal level data for analysis. They also suggested including both genders in the final survey to ensure the representativeness of the total sample. Other suggestions included omitting the question of time spent on training and instead asking when the officers' last training was received. The final revision included omitting questions 13 and 14 of the original questionnaire (Appendix D) concerning officers' perceived threat of occupational exposure to HIB and HBV. These questions were mentioned as items that might intensify perceived responses to the scenarios.

All panel members responded quickly with recommendations and suggestions and agreed that, with their suggested revisions, the instrument was appropriate for the study. They helped eliminate unnecessary wording in questions and assisted in keeping the scenarios common in nature and clear in their instructions.

Pilot Study 1

For this study, the original questionnaire (see Appendix D) was presented to 30 law enforcement officers who volunteered to participate. This sample of convenience included officers who are employed in a police force of a large southern university. Another pilot study was also performed because this population of officers may not be representative since they practice law enforcement for a campus rather than an ordinary population. The pilot study results estimated a completion time of ten minutes and confirmed that the wording and directions of the instrument were appropriate. This sample of officers asked a few questions that resulted in the elimination of unnecessary directions. Five response categories to the case scenarios were determined to be too many, requiring a collapsing of categories to ensure representativeness of the perceived risk levels. Three levels were chosen for the pilot study: (A) high risk, (B) moderate risk, and (C) low risk. The responses were analyzed to determine the frequency distribution of possible answers and to determine the level of risk for the scenarios. The pilot study indicated police officers do not like the idea of giving CPR to victims who may be infected with HIV or HBV. This scenario remained in the study because such situations do occur.

Pilot Study 2

For this study, the revised questionnaire was presented to 25 law enforcement officers drawn from a nearby East Tennessee town. The officers were given and completed their questionnaires before starting their respective shifts on three separate occasions. The pilot study results estimated a completion time of ten minutes and confirmed the wording and directions of the instrument were appropriate. To determine which scenarios were perceived as presenting the highest degree of perceived risk for the final instrument, the number of those responding to the different degrees of risk were reviewed. The results helped determine the levels of risk that each scenario represented and helped determine that the final order of least to most risk (see Appendix E). No problems were apparent with the administration of this questionnaire, and the instrument appeared to be in order for the final study.

Data Collection

The data were collected at the Knoxville, Tennessee, public safety building on four separate shift roll calls on November 21 and 22, 1995. The subjects were all volunteers and the results were held confidential, with anonymity a priority. The captain of the patrol division was contacted prior to administration of the questionnaire and approval was obtained with a memorandum sent to all shift sergeants acknowledging such approval. The department shift supervisor was notified in advance as to the nature of the questionnaire and cooperation was assured. A questionnaire was given out with an explanation of its purpose, allowing the officers to use their own writing instrument. All

questions were answered, and the survey took an average of ten minutes to complete. The survey was given during four shift line-ups to a total of 117 officers. A total of 105 completed questionnaires were used in the final study for a response rate of 90 percent. Twelve surveys were not returned or not completed in determining the final total. The shift sergeant monitored the officers to ensure that no officers worked together. The questionnaires were collected as the officers left for their patrol duties. No problems were apparent with the administration of the questionnaires.

Data Analysis

The data from the questionnaires were analyzed using the Statistical Package for the Social Sciences (SPSS) and consisted of ordinal-level data. Ordinal-level data imply that numbers assigned to sub-classes of any variable may be rank ordered according to some high-to-low arrangement (Champion, 1981). A review of the variables for this study indicated how the data were used in addressing the research questions.

The independent variables for this study were attainment of formal education, experience in law enforcement, training received concerning HIV and HBV pertaining to law enforcement, and hepatitis B inoculations. These data were designed to collect collapsed ordinal -level measures. Questions 1 through 12 were designed to gather descriptive data needed to make comparisons to the dependent variables.

The dependent variables for this study consisted of the perceived risk officers responded to, using the four case scenarios. The case scenarios represented common situations law enforcement personnel may encounter during the routine performance of

their duties. These scenarios were in an order representing the least risk to the greatest risk as determined by the pilot studies. Officers were asked to respond to the situations by making the statements complete: "Your risk of exposure to HIV/HBV in this situation is (A) high risk, (B) moderate risk, (C) low risk." A copy of the questionnaire is included in appendix E.

The measure of association chosen was Somers'd (yx) because it allows for the determination of the association between the dependent variables risk perceptions and the independent variables: formal education, experience, training received concerning HIV and HBV, and HBV immunizations. The primary assumptions for using Somers'd (yx) are two variables measured according to an ordinal scale and randomness (Champion, 1981). Somers'd (yx) was chosen specifically because this measure allows pairs that are tied on the dependent variable, (perceived risk), but not the independent variables (formal education, experience, training received concerning HIV or HBV, and HBV immunizations). When a sharp distinction can be made between independent and dependent variables, Somers'd (yx) is in many ways preferable to other measures since it allows for pairs of cases that are different on the independent variable, but tied on the dependent, and thus includes more information (Healey, 1993).

Advantages of using Somers'd (yx) analysis are:

1. Somers'd (yx) can achieve perfect negative and a perfect positive association, ranging from -1.00to +1.00 depending on the distribution on the table of frequencies.

2. Somers'd (yx) is designed for cross-tabulated data measured according to an ordinal scale.
3. Somers'd (yx) provides a relatively simple method for determining which variable is a better predictor (Champion, 1981).

Case Scenarios

Pilot studies were used to determine the degree of risk each officer perceived the situation to represent. The following includes a brief overview of each scenario listed, from the least degree of perceived risk to the greatest degree.

1. ***Drug Bust***—the officers were asked to respond to a scenario that places them in a situation as an undercover officer observing a parked car with suspects preparing to inject an illicit substance. The officers observe the suspects with narcotics and paraphernalia and arrest them. The officers must search the vehicle and handle all narcotics paraphernalia for evidence processing. They were asked to respond to the level of perceived risk they feel this situation would place them in for both HIV and HBV separately, with the levels being:

a) high risk

b) moderate risk

c) low risk

2. ***Barroom Fight***—the officers are dispatched to a local bar to intervene in a bloody fight involving a knife. The situation does not involve injury to the police, but does allow for officers to be exposed to suspect's blood. The officers are

required to process the bloody knife as evidence. They were asked to respond to the level of perceived risk to this situation for both HIV and HBV separately, with the levels being:

a) high risk

b) moderate risk

c) low risk

3. ***Violent Male Outside House***—the officers are dispatched to a violent confrontation involving a distraught male in a front yard. The officers arrive and find a male screaming he is dying, and the officers are told by a witness (identified as a close relative) that the suspect is in the latter stage of AIDS. Officers approach the suspect, who becomes violent and assaults them, causing several superficial wounds to the officers and requiring the officers to subdue him. They were asked to respond to the level of perceived risk they feel this situation would place them in for both HIV and HBV separately, with the levels being:

a) high risk

b) moderate risk

c) low risk

4. ***Stabbing***—the officers are dispatched to a hotel known for prostitution to investigate the reported stabbing of a woman. Upon arrival, the officers find an unconscious woman with two stab wounds, bleeding from the mouth. Drug paraphernalia is beside her. She stops breathing, requiring the officers to perform

artificial respiration with the normal protective equipment handy. The officers were asked to respond to the level of perceived risk to both HIV and HBV separately, with the levels being:

a) high risk

b) moderate risk

c) low risk

The scenarios are in the order from least to greatest risk as determined by the previously mentioned pilot studies. The terminology is one used consistently with law enforcement officers throughout the country. The officers did not appear to have any trouble understanding what each scenario represented, nor were there any concerns expressed during the pilot studies. The last scenario did prompt a number of police officers to state the victim in this case would probably die because they would not perform CPR on her.

Research Questionnaire Analysis

The first two research questions, listed below, were answered by analyzing the police officers' response to instrument question three, regarding their current education level, compared to their responses to the case scenarios. The first two research questions answered were the following:

1. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HIV?

2. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HBV?

The categories for questions one and two concerning education were (1) high school or GED, (2) some college, (3) associate degree, (4) bachelor's degree, (5) some graduate work and (6) master's degree or higher. These categories of formal education were analyzed and collapsed by actual formal education attained, as stated in the research question. This included a descriptive analysis of all the officers with a bachelor's degree or better, associate degree, and high school or GED with some college. This would allow some inferences to be drawn as to whether levels of formal education influence officers' perceived risk as measured by the scenario responses. Somers'd (yx) calculations were utilized to analyze these ordinal data.

The third and fourth research questions were answered by analyzing the police officers' responses to instrument question four, pertaining to their experience, compared to their responses to their recorded risk perception in the case scenarios. Question four of the questionnaire pertains to the total amount of experience officers have in law enforcement. The research questions answered were the following:

3. Does an officer's amount of law enforcement experience influence his or her level of perceived occupational risk to HIV?

4. Does an officer's amount of law enforcement experience influence his or her level of perceived occupational risk to HBV?

The officers were asked with an open-ended question format how long they have been employed in law enforcement. The category experience was then broken down for further analysis. This consisted of analyzing officers who have one or less to three years' experience, four to six years' experience, and seven or more years of experience. In this way the independent variable experience was reduced to produce ordinal -level data utilized in the association test Somers'd (yx). This allowed some inferences to be drawn as to whether experience influences an officer's level of perceived risk, as measured by the scenarios.

The fifth and sixth research questions were answered by analyzing the police officers' responses to instrument question ten, regarding the amount of training they have received while in law enforcement regarding HIV and HBV, in comparison to the level of perceived risk reported in the case scenarios. This independent variable was collapsed to analyze different levels of training received while in law enforcement. Categories were one or two series trained: N=64, or 61 percent; three to five series trained: N=30, or 28 percent; and six or more series trained: N=11, or 10 percent. The amount of training received by the officers served as the independent variable training, as utilized for statistical analysis for research questions 5 and 6. Somers' d (yx) calculations were used to analyze these ordinal- data. These categories were analyzed and compared to the officers' responses to the scenarios.

The research questions answered were the following:

5. Does the amount of an officer's HIV training influence his or her level of perceived occupational risk to HIV?

6. Does the amount of an officer's HBV training influence his or her level of perceived occupational risk to HBV?

Somers'd (yx) association tests were used in analyzing the data. The officers were asked how much training they had received since they had been in law enforcement. These responses were compared to the officers' responses to the scenarios in determining how the research question would be answered.

The seventh research question was answered by analyzing the police officers' responses to instrument question 12, regarding whether the officers were immunized to hepatitis, compared to their perceived level of risk reported in the case scenarios. They were considered immunized if they reported receiving at least one immunization injection. The research question answered was:

7. Do HBV-immunized officers have significant differences in their level of perceived occupational risk to HBV?

These responses were compared to the scenarios in determining how the research question would be answered.

Instrument questions 10 and 11 requested the officers to report how frequently, on a weekly basis, they feel they are exposed to HIV and HBV, as well as how long they feel such exposure takes place. These questions were used in an effort to gain information about the officers' perceived intensity of occupational exposure to such viruses. These

questions may aid in examining training techniques that reduce officers' perceptions of risks that these viruses actually represent.

Summary

Chapter 3 describes the methodology employed in this study. A cross-sectional survey research design was used to assess the officers' perceived risk of exposure to HIV and HBV. Case scenarios were utilized in comparison to descriptive data that pertained to the officers' formal educational attainment, years of experience, amount of training received concerning HIV and HBV while in law enforcement, and HBV immunization status. The development of the final instrument involved a panel of experts' review and two pilot studies. Statistical analysis involved measures of central tendencies, frequency distributions, measures of variation, and Somers'd (yx).

Chapter 4

Data Analysis

This chapter presents an analysis of the descriptive data collected through the development and administration of the questionnaire. The chapter is organized into the following sections: (1) Description of Sample, (2) Analysis of Data and (3) Summary.

Description of Sample

The sample surveyed consisted of 117 Knoxville City Police Department officers serving in the patrol division. The total number of completed questionnaires were 105, for a response rate of 90 percent. The sampled studied consisted of N= 99, or 94 percent males and N = 6, or 6 percent females. This ratio was equal to the actual ratio of males to females in the patrol division at the time the survey was distributed, with the total N= 389 officers with N= 19, or 5 percent females. The officers' average age was 31.2 years of age, with the average length of employment in law enforcement being 6.89 years. The descriptive data from the survey are in Appendix F.

Analysis of Data

The following section examines the relationship between various independent variables (described in previous section) and the responses to the case scenarios. The strength of the relationships was assessed using Somers'd (yx).

Research Question 1

1. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HIV?

This question was addressed by analyzing the descriptive data reported in the first part of the questionnaire in comparison to the officers' perceived risk. The variable formal education was collapsed into three distinct levels in reviewing the research question. The first level consisted of officers with a high school degree, GED, and some college (N=70, or 67%). The second level consisted of officers with an associate degree (N=20, or 19%). The third level consisted of officers with a bachelor's degree or some graduate work (N=15, or 14%). The variable risk perception also had three levels: high, moderate, and low corresponding to the perceived risk of the officers. These collapsed categories for both variables produced the ordinal data from which associations were made.

Analysis of HIV Risk in Case Scenario 1

The officers' perception of risk in the HIV drug-bust scenario was not independent of educational level [Somers'd (yx) = 0.292, p = .00413] with risk perception as the dependent variable. Education was statistically significant in its association with perceived risk for scenario 1. A graphic illustration is given in figure 1 and table 1.

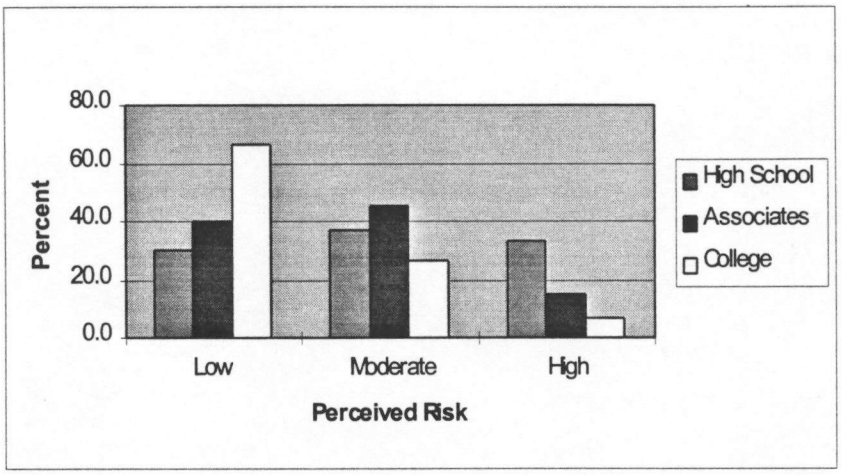

Figure 1 Case Scenario 1, Drug Bust, Question 1

Table 1 Case Scenario 1, Drug Bust, Question 1

Education	Low	Moderate	High	Total
High School or Some College	21 (30%)	26 (37.1%)	23 (32.9%)	70 (66.6%)
Associate Degree	8 (40%)	9 (45%)	3 (15%)	20 (19%)
Bachelor's Degree or Better	10 (66.6%)	4 (26.7%)	1 (6.7%)	15 (14.4%)
Total	39 (37.1%)	39 (37.1%)	27 (25.8%)	105

Analysis of HIV Risk in Case Scenario 2

The officers' perception of risk in the HIV barroom fight scenario was not independent of educational level [Somers'd (yx) = .43273, $\underline{P}$ = .00001] with risk perception as the dependent variable. Education was statistically significant in its association with perceived risk for scenario 2. A graphic illustration is given in figure 2 and table 2.

Analysis of HIV Risk in Case Scenario 3

The officers' perception of risk in the violent offender scenario was not independent of educational level [Somers' d (yx) =4160, P = 0000] with risk perception as the dependent variable. Education was statistically significant in its association with perceived risk for scenario 3. A graphic illustration is given in figure 3 and table 3.

Analysis of HIV Risk in Case Scenario 4

The perceived level of risk for all educational levels was extremely high for the scenario involving the bloody, unconscious prostitute with drug paraphernalia present [Somers'd (yx) =. 07673, P = .17994] with risk perception as the dependent variable. For this scenario education was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 4 and table 4.

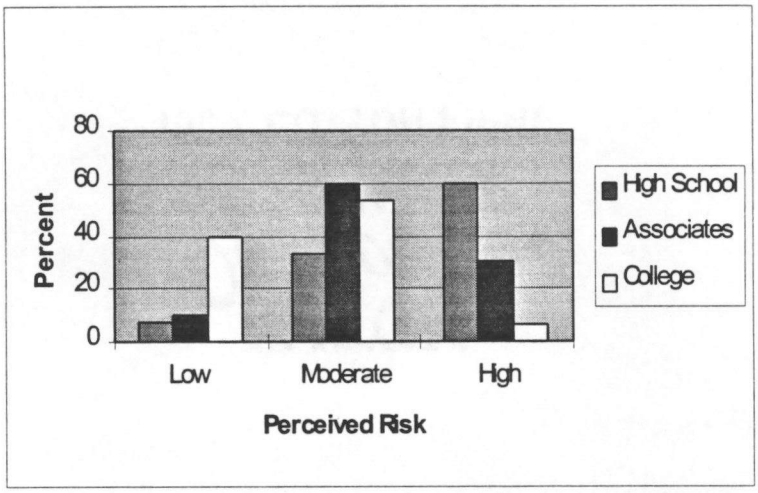

Figure 2 Case Scenario 2, Barroom Fight with Blood Exposure, Question 1

Table 2 Case Scenario 2, Barroom Fight with Blood Exposure, Question 1

Education	Low	Moderate	High	Total
High School or Some College	5 (7.1%)	23 (32.9%)	42 (60%)	70 (66.6%)
Associate Degree	2 (10%)	12 (60%)	6 (30%)	20 (19%)
Bachelor's Degree or Better	6 (40%)	8 (53.3%)	1 (6.7%)	15 (14.4%)
Total	13 (12.4%)	43 (41%)	49 (46.6%)	105

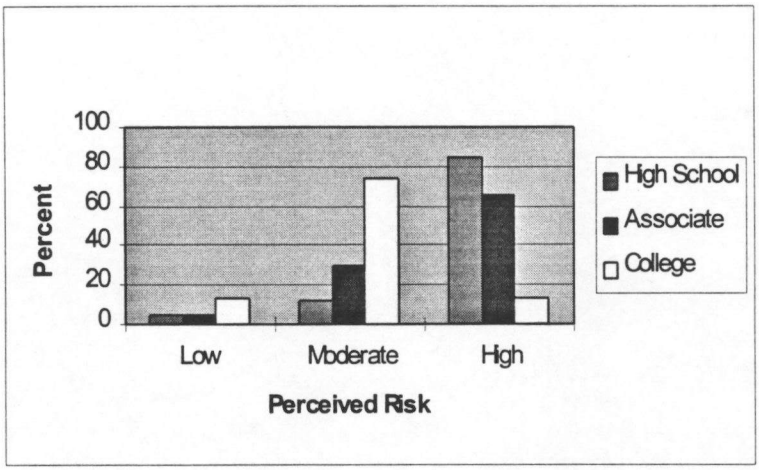

Figure 3 Case Scenario 3, Violent, Possible HIV-infected Offender, Question 1

Table 3 Case Scenario 3, Violent, Possible HIV-infected Offender, Question 1

Education	Low	Moderate	High	Total
High School or Some College	3 (4.3%)	8 (11.4%)	59 (84.3%)	70 (66.6%)
Associate Degree	1 (5%)	6 (30%)	13 (65%)	20 (19%)
Bachelor's Degree or Better	2 (13.3%)	11 (73.4%)	2 (13.3%)	15 (14.4%)
Total	6 (5.7%)	25 (23.8%)	74 (70.5%)	105

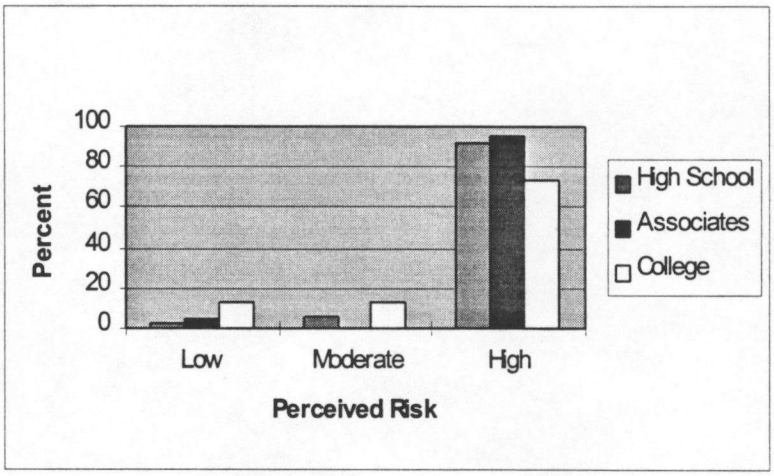

Figure 4 Case Scenario 4, Stabbed, Drug-using Prostitute Needing CPR, Question 1

Table 4 Case Scenario 4, Stabbed, Drug-using Prostitute Needing CPR, Question 1

Education	Low	Moderate	High	Total
High School or Some College	2 (2.9%)	4 (5.7%)	64 (91.4%)	70 (66.6%)
Associate Degree	1 (5%)	0 (0%)	19 (95%)	20 (19%)
Bachelor's Degree or Better	2 (13.3%)	2 (13.3%)	11 (73.3%)	15 (14.4%)
Total	5 (4.8%)	6 (5.7%)	94 (89.5%)	105

Research Question 2

2. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HBV?

To address this research question, a breakdown of each educational level in regard to subjects' responses to each scenario was reviewed. The variable formal education was collapsed into three distinct formal levels in reviewing the research question. The first level consisted of officers with a high school degree, GED, and some college (N=70, or 67%). The second level consisted of officers with an associate degree (N=20, or 19%). The third level consisted of officers with a bachelor's degree or some graduate work (N=15, or 14%). The variable risk perception also had three levels: high, moderate, and low corresponding to the perceived risk reported by the officers. Each scenario was analyzed by a review of descriptive statistics and Somers'd (yx) calculations.

Analysis of HBV Risk in Case Scenario 1

The officers' perception of risk in the drug-bust scenario was not independent of educational level [Somers' d (yx) (N=105) = .2720, P = .00676] with risk perception as the dependent variable. Education was statistically significant in its association with perceived risk for scenario 1. A graphic illustration is given in figure 5 and table 5.

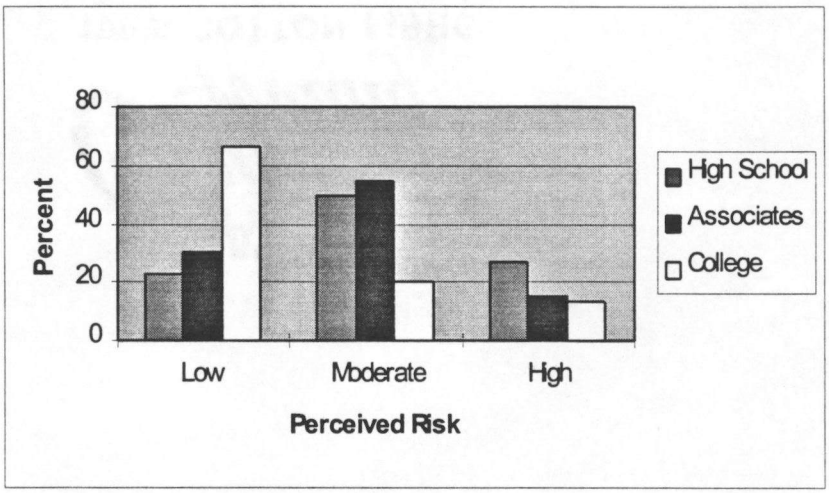

Figure 5 Case Scenario 1, Drug Bust, Question 2

Table 5 Case Scenario 1, Drug Bust, Question 2

Education	Low	Moderate	High	Total
High School or Some College	16 (22.9%)	35 (50%)	19 (27.1%)	70 (66.6%)
Associate Degree	6 (30%)	11 (55%)	3 (15%)	20 (19%)
Bachelor's Degree or Better	10 (66.7%)	3 (20%)	2 (13.3%)	15 (14.4%)
Total	32 (30.5%)	49 (46.7%)	24 (22.9%)	105

Analysis of HBV Risk in Case Scenario 2

The officers' perception of risk in the HBV barroom fight scenario was not independent of educational level [Somers'd (yx) = .45345, P =. 0000] with risk perception as the dependent variable. Education was statistically significant in its association with perceived risk for scenario 2. A graphic illustration is given in figure 6 and table 6.

Analysis of HBV Risk in Case Scenario 3

The officers' perception of risk to the violent offender scenario was not independent of educational level [Somers'd (yx) = .3120, P = .00044]. Education was statistically significant in its association with perceived risk for scenario 3. A graphic illustration is given in figure 7 and table 7.

Analysis of HBV Risk in Case Scenario 4

The risks in this scenario were exceptionally high, and the responses indicated officers from all formal education levels recognized this as true [Somers'd (yx)= .07745, p= .17978]. For this scenario, education would not be statistically significant in its association with perceived risk. A graphic illustration is given in figure 8 and table 8.

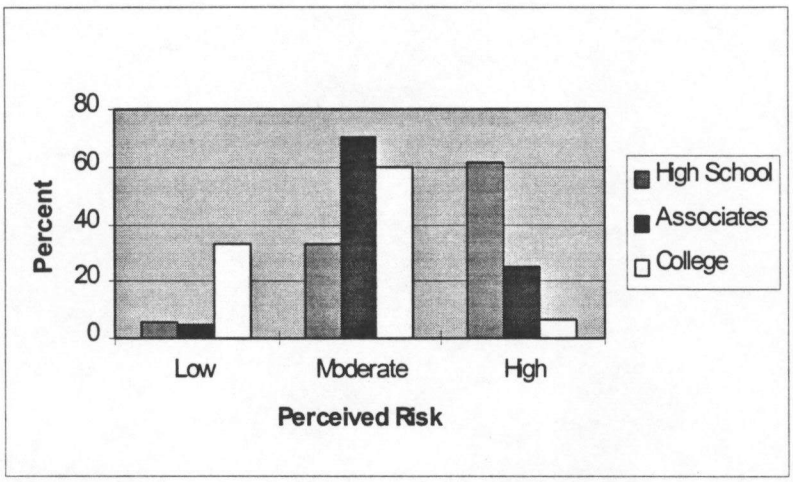

Figure 6 Case Scenario 2, Barroom Fight with Blood Exposure, Question 2

Table 6 Case Scenario 2, Barroom Fight with Blood Exposure, Question 2

Education	Low	Moderate	High	Total
High School or Some College	4 (5.7%)	23 (32.9%)	43 (61.4%)	70 (66.6%)
Associate Degree	1 (5%)	14 (70%)	5 (25%)	20 (19%)
Bachelor's Degree or Better	5 (33%)	9 (60%)	1 (6.7%)	15 (14.4%)
Total	10 (9.5%)	46 (43.8%)	49 (46.7%)	105

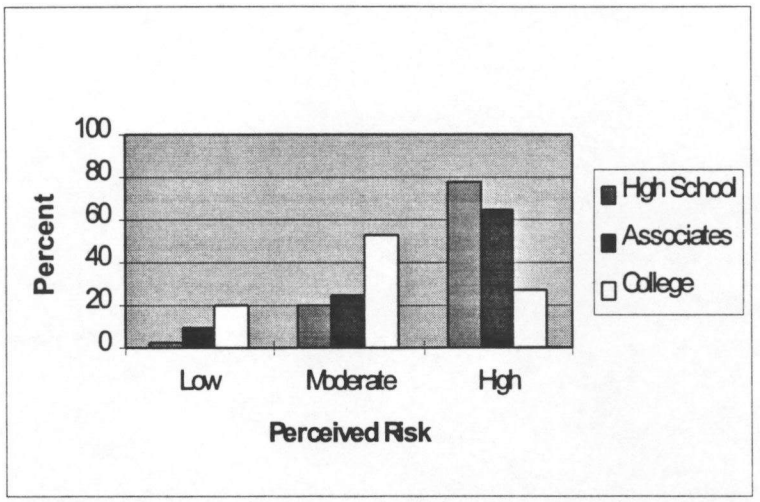

Figure 7 Case Scenario 3, Violent, Possible HIV- infected Offender, Question 2

Table 7 Case Scenario 3, Violent, Possible HIV- infected Offender, Question 2

Education	Low	Moderate	High	Totals
High School or Some College	2 (2.9%)	14 (20%)	54 (77.1%)	70 (66.6%)
Associate Degree	2 (10%)	5 (25%)	13 (65%)	20 (19%)
Bachelor's Degree or Better	3 (20%)	8 (53.3%)	4 (6.7%)	15 (14.4%)
Total	7 (6.7%)	27 (25.7%)	71 (67.6%)	105

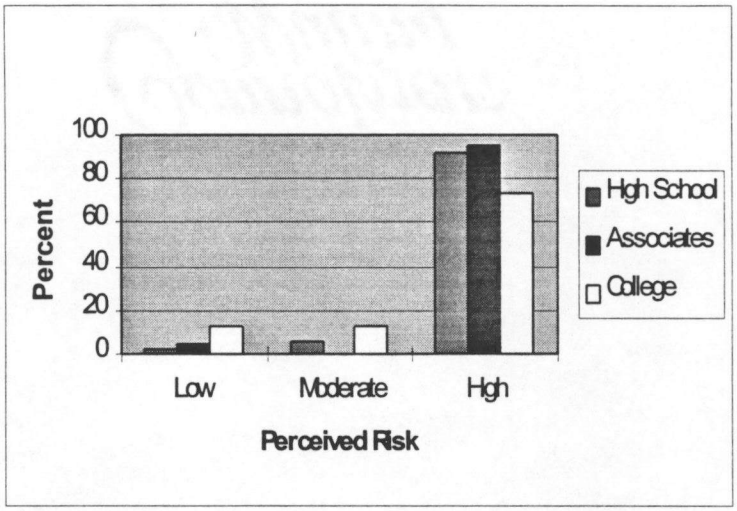

Figure 8 Case Scenario 4, Stabbed, Drug- using Prostitute Needing CPR, Question 2

Table 8 Case Scenario 4, Stabbed, Drug- using Prostitute Needing CPR, Question 2

Education	Low	Moderate	High	Total
High School or Some College	2 (2.9%)	3 (4.3%)	65 (92.9%)	70 (66.6%)
Associate Degree	2 (10%)	0 (0)%	18 (90%)	20 (19%)
Bachelor's Degree or Better	2 (13.3%)	1 (6.7%)	12 (80%)	15 (14.4%)
Total	6 (5.7%)	4 (3.8%)	95 (90.5%)	105

Research Question 3

3. Does an officer's amount of experience influence his or her level of perceived occupational risk to HIV?

The independent variable experience was referred to as years of employment in law enforcement as reported on the questionnaire. This variable was collapsed into three ordinal-level categories in order to test research question 3. The first includes responses for one to three years, the second four to six years, and the last seven-plus years' experience in law enforcement. The variable risk perception also had three levels: high, moderate, and low corresponding to the perceived risk of the officers.

Analysis of HIV Risk in Case Scenario 1

Statistical computation did not indicate experience to be significant in influencing officers' perceived risk in this scenario [Somers'd (yx) =. 02266, P= .79450] with risk perception as the dependent variable. Education was not statistically significant in its association with perceived risk for scenario 1. A graphic illustration is given in figure 9 and table 9.

Analysis of HIV Risk in Case Scenario 2

Statistical computation did not indicate experience to be significant in influencing officers' perceived risk in this scenario [Somers'd (yx) = .03723, P= .65759] with risk perception as the dependent variable. For this scenario experience was not statistically significant in its association with perceived risk. A graphic illustration is given in table 10 and figure 10.

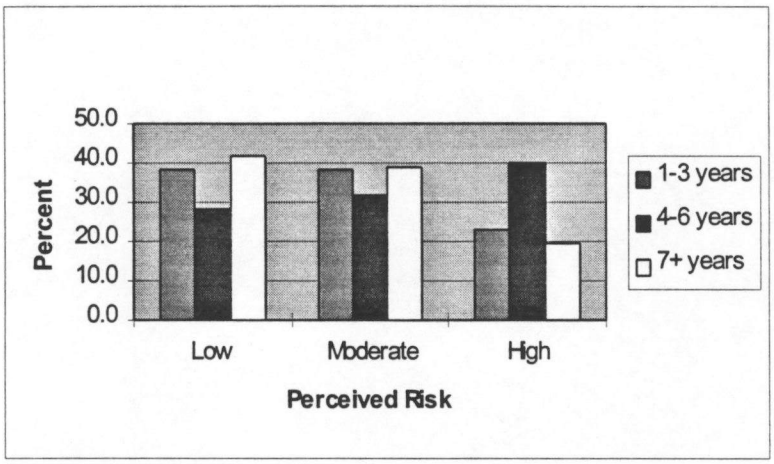

Figure 9 Case Scenario 1, Drug Bust, Question 3

Table 9 Case Scenario 1, Drug Bust, Question 3

Experience	Low	Moderate	High	Total
1-3 years	15 (38.5%)	15 (38.5%)	9 (23.0%)	39 (37.1%)
4-6 years	7 (28%)	8 (32%)	10 (40%)	25 (23.9%)
7 + years	17 (41.5%)	16 (39%)	8 (19.5%)	41 (39%)
Total	39 (37.1%)	39 (37.1%)	27 (25.7%)	105

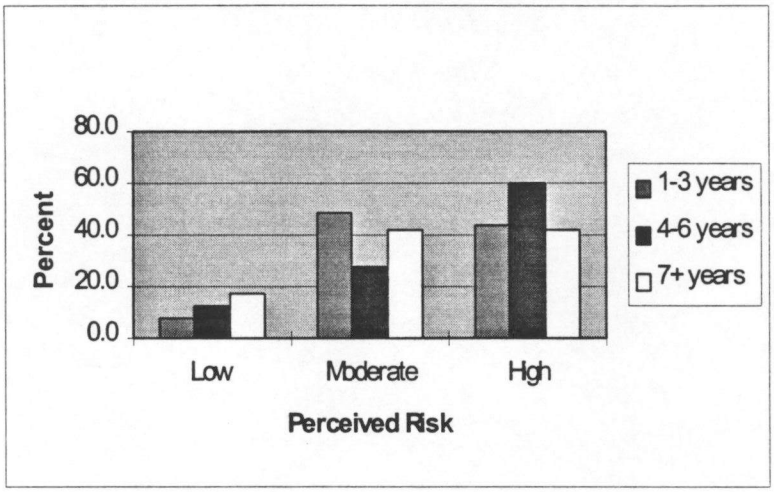

Figure 10 Case Scenario 2, Barroom Fight with Blood Exposure, Question 3

Table 10 Case Scenario 2, Barroom Fight with Blood Exposure, Question 3

Experience	Low	Moderate	High	Total
1-3 years	3 (7.7%)	19 (48.7%)	17 (43.6%)	39 (37.1%)
4-6 years	3 (12%)	7 (28%)	15 (60%)	25 (23.9%)
7 + years	7 (17.0%)	17 (41.5%)	17 (41.5%)	41 (39%)
Total	13 (12.3%)	43 (41%)	49 (46.7%)	105

Analysis of HIV Risk in Case Scenario 3

Statistical computation did not indicate experience to be significant in influencing officers' perceived risk in this scenario [Somers' d (yx) =.03615, P= .62426] with risk perception as the dependent variable. For this scenario experience was not statistically significant in its association with perceived risk. All three levels of experience (N=70.5%) of the total sample recorded a high perception of risk. A graphic illustration is given in figure 11 and table 11.

Analysis of HIV Risk in Case Scenario 4

This scenario was reported as a consistent high risk for all three experience-level categories (N=94, or 89.5%). Statistical computations indicated experience not to be significant in influencing officers' perceived risk in this scenario [Somers'd (yx) = 01295, P=. 82355] with risk perception as the dependent variable. For this scenario experience was not statistically significant its association with perceived risk. A graphic illustration is given in figure 12 and table 12.

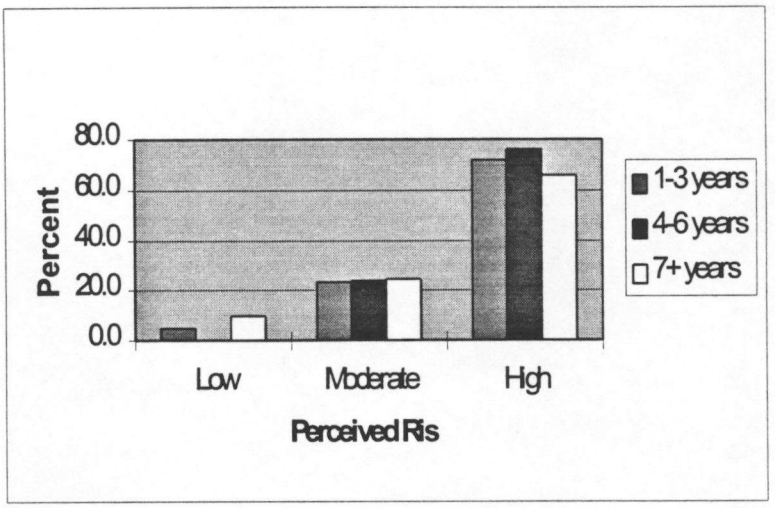

Figure 11 Case Scenario 3, Violent, Possible HIV- infected Offender, Question 3

Table 11 Case Scenario 3, Violent, Possible HIV- infected Offender, Question 3

Experience	Low	Moderate	High	Total
1-3 years	2 (5.1%)	9 (23.2%)	28 (71.8%)	39 (37.1%)
4-6 years	0 (0)%	6 (24%)	19 (76%)	25 (23.9%)
7 + years	4 (9.7%)	10 (24.4%)	27 (65.9%)	41 (39%)
Total	6 (5.7%)	25 (23.8%)	74 (70.5%)	105

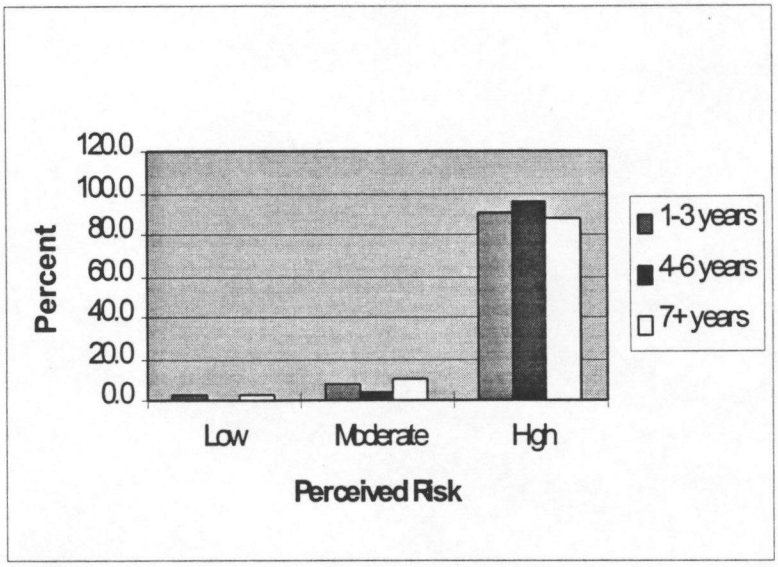

Figure 12 Case Scenario 4, Stabbed, Drug-using Prostitute Needing CPR, Question 3

Table 12 Case Scenario 4, Stabbed, Drug-using Prostitute Needing CPR, Question 3

Experience	Low	Moderate	High	Total
1-3 years	1 (2.6%)	3 (8%)	35 (90%)	39 (37.1%)
4-6 years	0 (0)%	1 (4%)	24 (96%)	25 (23.8%)
7 + years	1 (2.4%)	4 (9.8%)	36 (87.8%)	41 (39%)
Total	2 (1.9%)	8 (7.6%)	95 (90.5%)	105

Research Question 4

4. Does an officer's amount of experience influence his or her level of perceived occupational risk to HBV?

The variable experience was referred to as years of employment in law enforcement as reported on the questionnaire. This variable was collapsed into three ordinal levels in order to test research question 4. The first included responses for one to three years, the second four to six years, and the last seven plus years' experience in law enforcement. The variable risk perception also had three levels: high, moderate and low corresponding to the perceived risk of the officers.

Analysis of HBV Risk in Case Scenario 1

Statistical computation indicated experience not to be significant as it relates to this scenario [Somers'd (yx) = -.00324, P =.97164] with risk perception as the dependent variable. For this scenario experience was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 13 and table 13.

Analysis of HBV Risk in Case Scenario 2

Statistical computations did not indicate experience to be significant in influencing officers' perceived risk in this scenario [Somers' d(yx) =.0669, P = .42008] with risk perception as the dependent variable. For this scenario experience was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 14 and table 14.

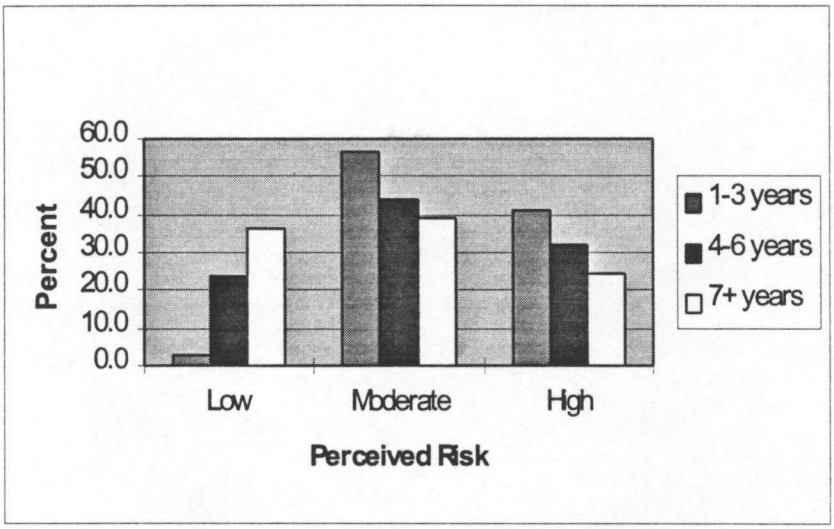

Figure 13 Case Scenario 1,Drug Bust, Question 4

Table 13 Case Scenario 1, Drug Bust, Question 4

Experience	Low	Moderate	High	Total
1-3 years	1 (2.6%)	22 (56.4%)	16 (41%)	39 (37.1%)
4-6 years	6 (24%)	11 (44%)	8 (32%)	25 (23.9%)
7 + years	15 (36.6%)	16 (39%)	10 (24.4%)	41 (39%)
Total	22 (21%)	49 (46.6%)	34 (32.4%)	105

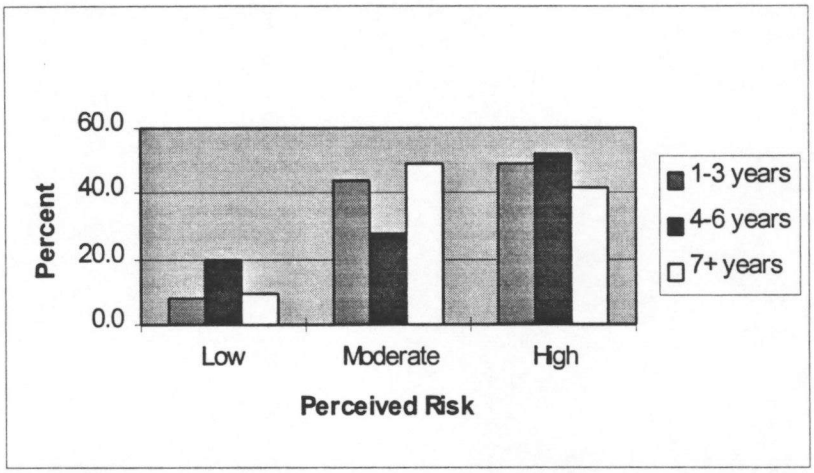

Figure 14 Case Scenario 2, Barroom Fight with Blood Exposure, Question 4

Table 14 Case Scenario 2, Barroom Fight with Blood Exposure, Question 4

Experience	Low	Moderate	High	Total
1-3 years	3 (7.7%)	17 (43.6%)	19 (48.7%)	39 (37.1%)
4-6 years	5 (20%)	7 (28%)	13 (52%)	25 (23.9%)
7 + years	4 (9.7%)	20 (48.8%)	17 (41.5%)	41 (39%)
Total	12 (11.4%)	44 (42%)	49 (46.6%)	105

Analysis of HBV Risk in Case Scenario 3

Statistical computations did not indicate experience to be significant in influencing officers' perceived risk in this scenario [Somers'd (yx) =-.04046, P = .59491] with risk perception as the dependent variable. For this scenario experience was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 15 and table 15.

Analysis of Perceived HBV Risk in Case Scenario 4

Statistical computation indicated experience not to be significant in influencing officers' perceived risk for this scenario [Somers'd (yx) =-.05098, P = .28908] with risk perception as the dependent variable. For this scenario experience was not statistically significant in its association with perceived risk. A graphic illustration is given figure 16 and table 16.

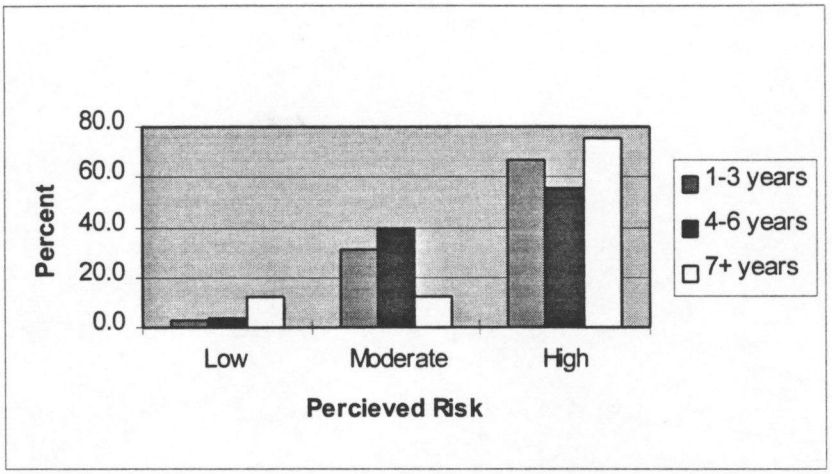

Figure 15 Case Scenario 3, Violent, Possible HIV- infected Offender, Question 4

Table 15 Case Scenario 3, Violent, Possible HIV- infected Offender, Question 4

Experience	Low	Moderate	High	Total
1-3 years	1 (2.5%)	12 (30.8%)	26 (66.7%)	39 (37.1%)
4-6 years	1 (4%)	10 (40%)	14 (56%)	25 (23.9%)
7 + years	5 (12.2%)	5 (12.2%)	31 (75.6%)	41 (39%)
Total	7 (6.6%)	27 (25.7%)	71 (67.6%)	105

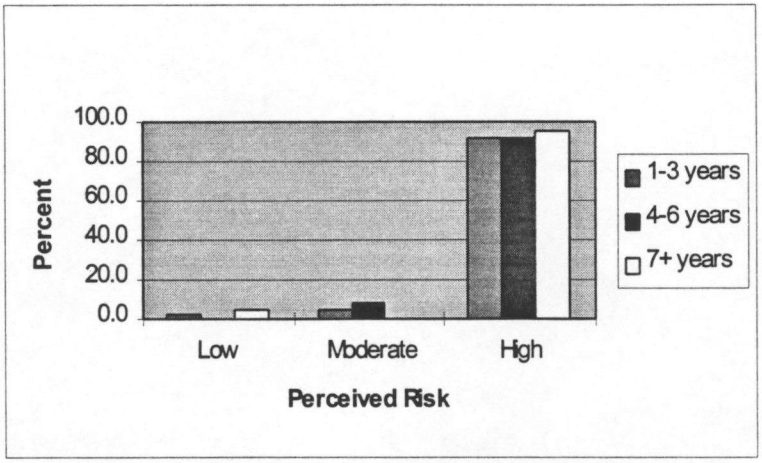

Figure 16 Case Scenario 4, Stabbed, Drug- using Prostitute Needing CPR, Question 4

Table 16 Case Scenario 4, Stabbed, Drug -using Prostitute Needing CPR, Question 4

Experience	Low	Moderate	High	Total
1-3 years	1 (2.6%)	2 (5.1%)	36 (92.3%)	39 (37.1%)
4-6 years	0 (0)%	2 (8%)	23 (92%)	25 (23.9%)
7 + years	2 (4.9%)	0 (0)%	39 (95%)	41 (39%)
Total	6 (5.8%)	4 (3.8%)	95 (90.4%)	105

Research Question 5

5. Does the amount of an officer's HIV training influence his or her level of perceived occupational risk to HIV?

This research question was examined by using a frequency-distribution chart and Somers'd (yx) computation comparing question 10 on the questionnaire asking the officers how much training they had received concerning HIV or HBV, the independent variable in comparison to the officers' perceived risk responses to the case scenarios. This question asked, "How many different series of training have you received concerning HIV and HBV since you have been in law enforcement?" These categories were collapsed into the three ordinal levels for analysis. The first level was one to two training series, the second three to five training series, and the third six or more training series. The variable risk perception also had three levels: high, moderate, and low corresponding to the perceived risk of the officers.

Analysis of Perceived HIV Risk in Case Scenario 1

Statistical computation found training to be not significant in influencing officers' perceived risk in this scenario. [Somers'd (yx) =.15024, P = .18342] with risk perception as the dependent variable. For this scenario training was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 17 and table 17.

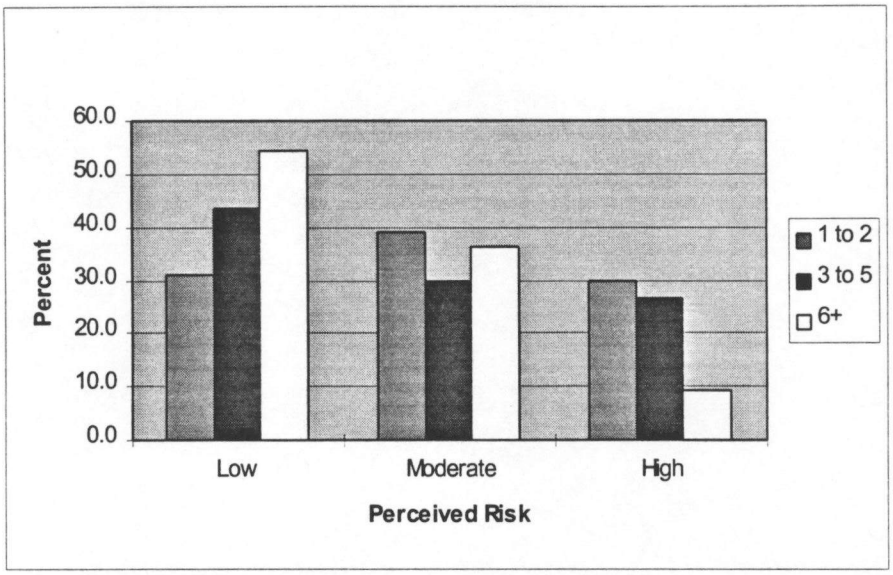

Figure 17 Case Scenario 1, Drug Bust, Question 5

Table 17 Case Scenario 1, Drug Bust, Question 5

Series of Training received	Low	Moderate	High	Total
1-2	20 (31.2%)	26 (39.1%)	18 (29.7%)	64 (61%)
3-5	13 (43.3%)	9 (30%)	8 (26.7%)	30 (28.5%)
6+	6 (54.5%)	4 (36.4%)	1 (9.1%)	11 (10.5%)
Total	39 (37.2%)	39 (37.2%)	27 (25.6%)	105

Analysis of Perceived HIV Risk in Case Scenario 2

Statistical computations did not indicate the amount of HIV or HBV training received to be significant in influencing officers' perceived risk in this scenario [Somers'd (yx) = .03975, P = .74047] with risk perception as the dependent variable. For this scenario the amount of training received was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 18 and table 18.

Analysis of Perceived HIV Risk in Case Scenario 3

Computation of Somers'd (yx) found training to be insignificant in influencing officers' perceived risk in this scenario [Somers'd (yx) =.01073, P = .93491]. For this scenario the amount of training received was not statistically significant in its association with perceived risk A graphic illustration is given in figure 19 and table 19.

Analysis of Perceived HIV Risk in Case Scenario 4

Statistical computation found training to be not significant in influencing officers' perceived risk in this scenario [Somers'd(yx) =.-01033, P =.79363] with risk perception as the dependent variable. A review of the frequency distribution of the responses indicated the number of training series received did not make any difference in the amount of perceived risk to this high-risk situation. A graphic illustration is given in figure 20 and table 20.

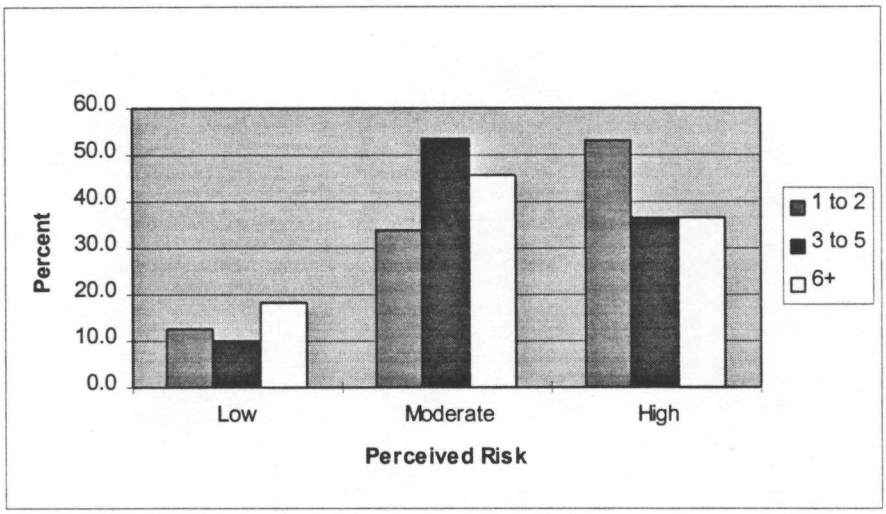

Figure 18 Case Scenario 2, Barroom Fight with Blood Exposure, Question 5

Table 18 Case Scenario 2, Barroom Fight with Blood Exposure, Question 5

Series of Training Received	Low	Moderate	High	Total
1-2	8 (12.5%)	22 (34.4%)	34 (53.1%)	64 (61%)
3-5	3 (10%)	16 (53.3%)	11 (36.7%)	30 (28.5%)
6+	2 (18.1%)	5 (54.5%)	4 (36.4%)	11 (10.5%)
Total	15 (14.3%)	43 (41%)	49 (46.7%)	105

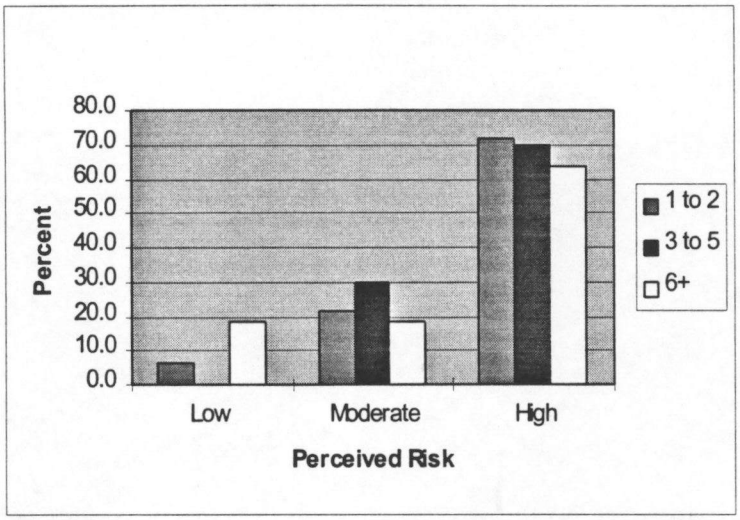

Figure 19 Case Scenario 3, Violent Possible HIV-infected Offender, Question 5

Table 19 Case Scenario 3, Violent Possible HIV-infected Offender, Question 5

Series of Training received	Low	Moderate	High	Total
1-2	4 (6.2%)	14 (21.9%)	46 (71.9%)	64 (61%)
3-5	0 (0)%	9 (30%)	21 (70%)	30 (28.5%)
6+	2 (18.2%)	2 (18.2%)	7 (63.6%)	11 (10.5%)
Total	6 (5.7%)	25 (23.8%)	74 (70.5%)	105

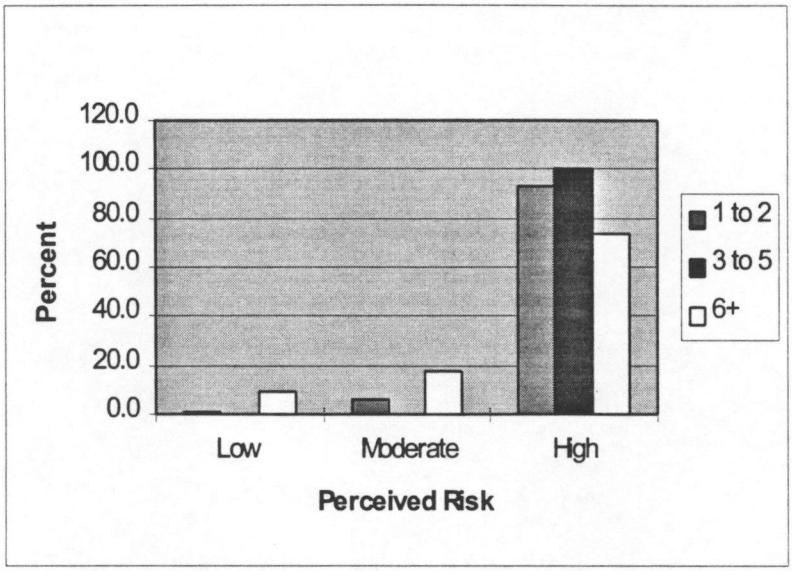

Figure 20 Case Scenario 4, Stabbed, Drug -using Prostitute Needing CPR, Question 5

Table 20 Case Scenario 4, Stabbed, Drug- using Prostitute Needing CPR, Question 5

Series of Training received	Low	Moderate	High	Total
1-2	1 (1%)	4 (6%)	59 (93%)	64 (61%)
3-5	0 (0)%	0 (0)%	30 (100%)	30 (28.5%)
6+	1 (9%)	2 (18%)	8 (73%)	11 (10.5%)
Total	7 (6.6%)	27 (25.8%)	71 (67.6%)	105

Research Question 6

6. Does the amount of an officer's HBV training influence his or her level of perceived occupational risk to HBV?

To analyze this research question, the independent variable training was collapsed into three categories. These categories were collapsed into the following groups: one to two training series, three to five training series, and six or more training series. The variable risk perception also had three levels: high, moderate, and low, corresponding to the perceived risk of the officers. Frequency distributions and Somers'd (yx) test computations were used to address this research question.

Analysis of Perceived HBV Risk in Case Scenario 1

Statistical computation found training to be not significant in influencing officers' perceived risk in this scenario [Somers'd (yx) = -.05684, P= .63293] with risk perception as the dependent variable. For this scenario the amount of training received was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 21 and table 21.

Analysis of Perceived HBV Risk in Case Scenario 2

Computation of Somers'd (yx) statistical test found training to be not significant in influencing officers' perceived risk to this scenario [Somers'd (yx) =-.06518, P = .53846] with risk perception as the dependent variable. For this scenario the amount of training received was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 22 and table 22.

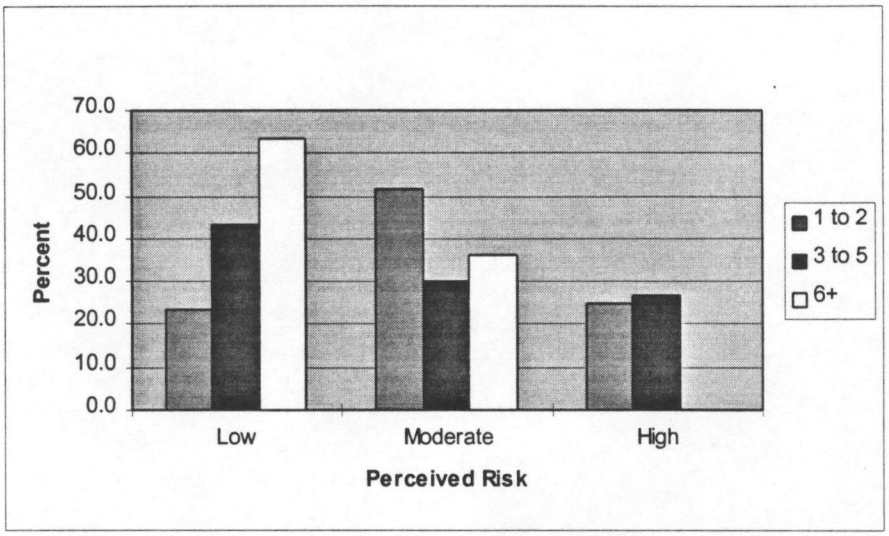

Figure 21 Case Scenario 1, Drug Bust, Question 6

Table 21 Case Scenario 1, Drug Bust, Question 6

Series of Training Received	Low	Moderate	High	Total
1-2	15 (23.4%)	33 (51.6%)	16 (25%)	64 (61%)
3-5	13 (43.3%)	9 (30%)	8 (26.7%)	30 (28.5%)
6+	7 (63.6%)	4 (36.4%)	0 (0)%	11 (10.5%)
Total	35 (33.3%)	46 (43.8%)	24 (22.9%)	105

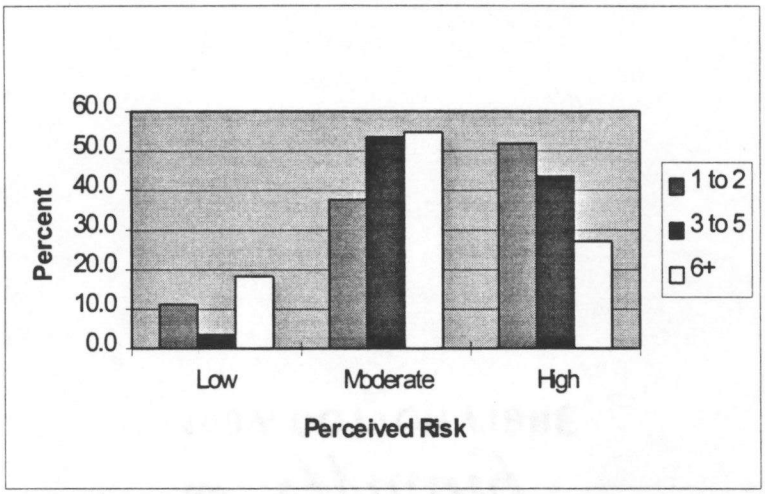

Figure 22 Case Scenario 2, Barroom Fight with Blood Exposure, Question 6

Table 22 Case Scenario 2, Barroom Fight with Blood Exposure, Question 6

Series of Training Received	Low	Moderate	High	Total
1-2	7 (10.9%)	24 (37.5%)	33 (51.6%)	64 (61%)
3-5	1 (3.4%)	16 (53.3%)	13 (43.3%)	30 (28.5%)
6+	2 (18.2%)	6 (54.5%)	3 (27.3%)	11 (10.5%)
Total	10 (9.6%)	46 (43.8%)	49 (46.6%)	105

Analysis of Perceived HBV Risk in Case Scenario 3

Computation of Somers'd (yx) test found training to be not significant in influencing officers' perceived risk in this scenario [Somers'd (yx) = -.05882, p =.54371] with risk perception as the dependent variable. For this scenario the amount of training received was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 23 and table 23.

Analysis of Perceived HBV Risk in Case Scenario 4

Computation of Somers'd (yx) test found training to be not significant in influencing officers' perceived risk in this scenario [Somers'd (yx) = -.06161, P =.39018] with risk perception as the dependent variable. For this scenario the amount of training received was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 24 and table 24.

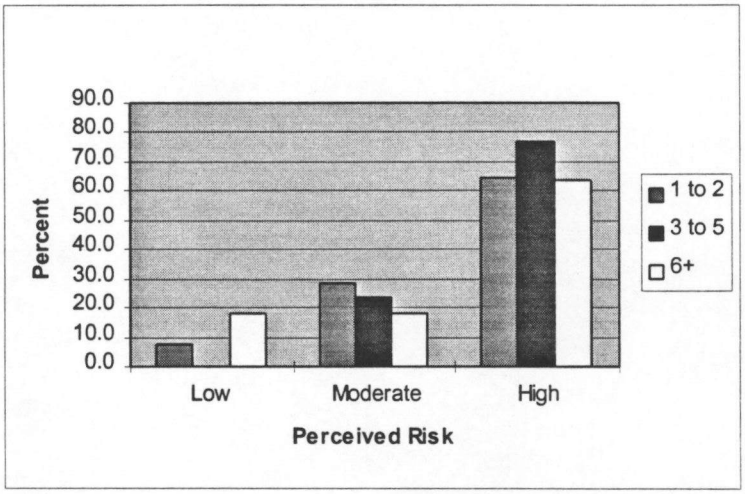

Figure 23 Case Scenario 3, Violent, Possible HIV-infected Offender, Question 6

Table 23 Case Scenario 3, Violent, Possible HIV-infected Offender, Question 6

Series of Training Received	Low	Moderate	High	Total
1-2	5 (7.8%)	18 (28.1%)	41 (64.1%)	64 (61%)
3-5	0 (0%)	7 (23.3%)	23 (76.7%)	30 (28.5%)
6+	2 (18%)	2 (18%)	7 (64%)	11 (10.5%)
Total	7 (6.6%)	27 (25.8%)	71 (67.6%)	105

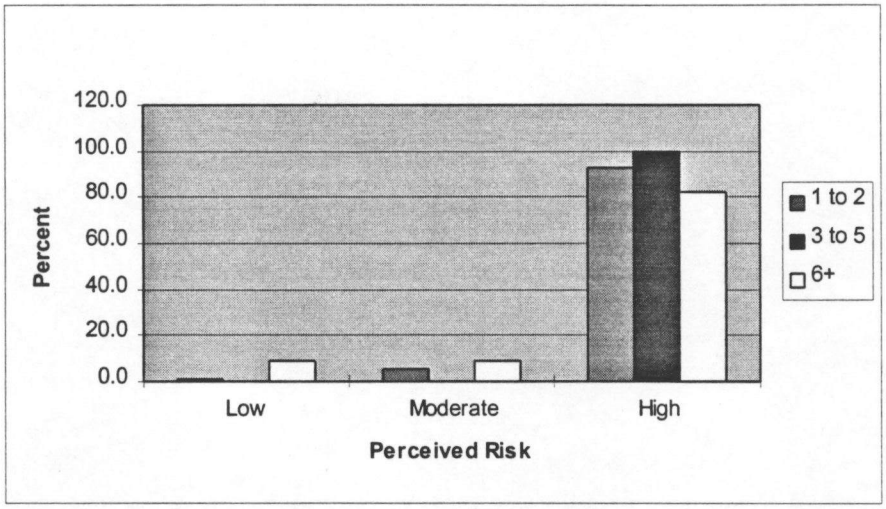

Figure 24 Case Scenario 4, Stabbed, Drug-using Prostitute Needing CPR , Question 6

Table 24 Case Scenario 4, Stabbed, Drug-using Prostitute Needing CPR , Question 6

Series of Training Received	Low	Moderate	High	Total
1-2	2 (1%)	3 (5%)	59 (93%)	64 (61%)
3-5	0 (0%)	0 (0%)	30 (28.5%)	30 (28.5%)
6+	2 (9.1%)	2 (9.1%)	9 (81.8%)	13 (12.5%)
Total	4 (3.8%)	5 (4.8%)	96 (91.4%)	105

Research Question 7

7. Do HBV-immunized officers have significant differences in their level of perceived occupational risk to HBV.

This question was addressed by reviewing the officers who had been immunized to HBV in comparison to those who had not. The independent variable was immunization status, with an overwhelming number of the officers (N=91, or 86.7%) being immunized. Officers who had received at least one of the three shots were counted as being immunized. The dependent variable was the risk perception, which was divided into three levels: high, moderate, and low.

Analysis of Perceived HBV Risk in Case Scenario 1

The calculations were performed using Somers'd (yx) testing, and the results indicated immunization was not significant in its association to perceived risk [Somers'd (yx) = .00078, P = 1.000] with risk perception as the dependent variable. For this scenario HBV immunization was not statistically significant in its association with perceived risk. A graphic illustration is given in figure 25 and table 25.

Analysis of Perceived HBV Risk in Case Scenario 2

The calculations were performed using Somers'd (yx) testing, and the results indicated immunization was not significant [Somers'd (yx) = .06907, P = .68167] with risk perception as the dependent variable. A graphic illustration is given in figure 26 and table 26.

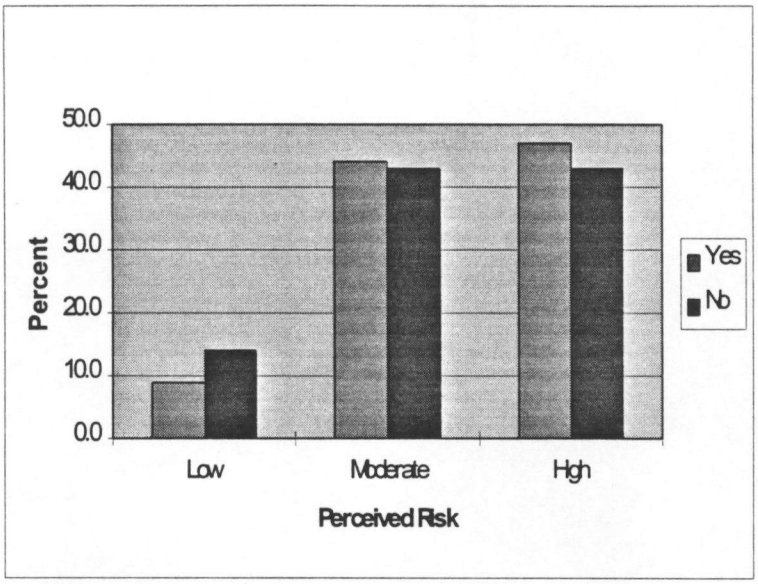

Figure 25 Case Scenario 1, Drug Bust, Question 7

Table 25 Case Scenario 1, Drug Bust, Question 7

Immunizations	Low	Moderate	High	Total
YES	8 (9%)	40 (44%)	43 (47%)	91 (87%)
NO	2 (14%)	6 (43%)	6 (43%)	14 (13%)
Total	10 (9.5%)	46 (43.8%)	49 (46.7%)	105

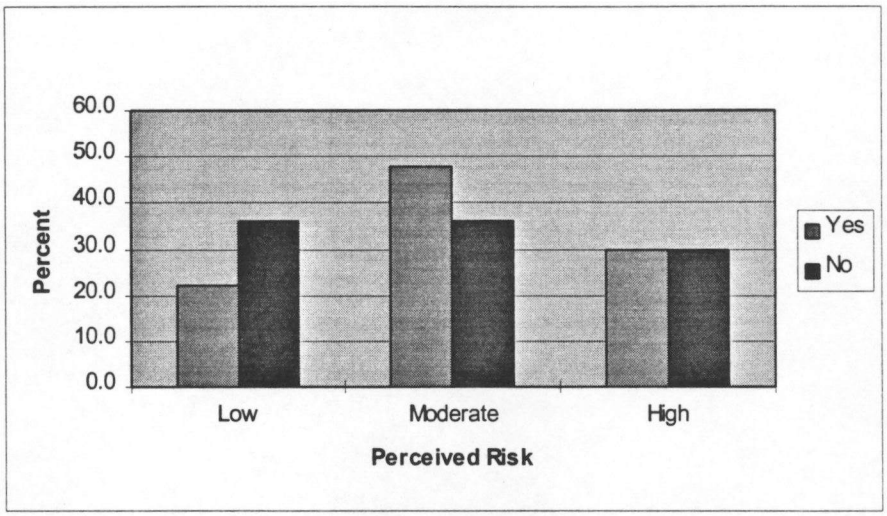

Figure 26 Case Scenario 2, Barroom Fight with Blood Exposure, Question 7

Table 26 Case Scenario 2, Barroom Fight with Blood Exposure, Question 7

Immunizations	Low	Moderate	High	Total
YES	20 (22%)	44 (48%)	27 (30%)	91 (87%)
NO	5 (36%)	5 (36%)	4 (30%)	14 (13%)
Total	25 (23.8%)	49 (46.7%)	31 (29.5%)	105

Analysis of Perceived HBV Risk in Case Scenario 3

The calculations were performed using Somers'd (yx) testing, and the results indicated immunization was not statistically significant [Somer's d (yx)=-.08948, [p = .51620] with risk perception as the dependent variable. A graphic illustration is given in figure 27 and table 27.

Analysis of Perceived HBV Risk in Case Scenario 4

The calculation of the Somers'd (yx) testing indicated immunization was not significant [Somers'd (yx) = -.02433, P = 1.0000] with risk perception as the dependent variable. A graphic illustration is given in figure 28 and table 28.

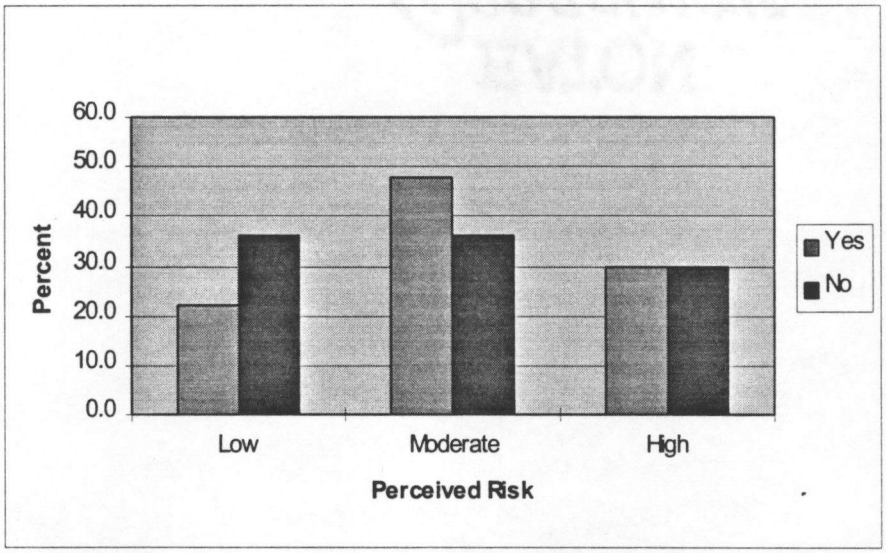

Figure 27 Case Scenario 3, Violent, Possible HIV-infected Offender, Question 7

Table 27 Case Scenario 3, Violent, Possible HIV-infected Offender, Question 7

Immunizations	Low	Moderate	High	Total
YES	5 (5.5%)	26 (28.6%)	60 (65.9%)	91 (87%)
NO	2 (14.3%)	1 (7.1%)	11 (78.6%)	14 (13%)
Total	7 (67.6%)	27 (25%)	71 (67.6%)	105

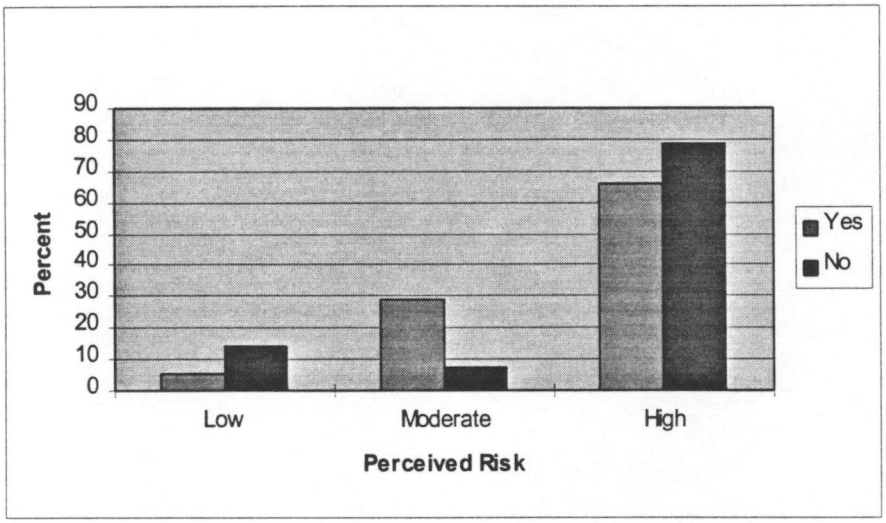

Figure 28 Case Scenario 4, Stabbed, Drug- using Prostitute Needing CPR, Question 7

Table 28 Case Scenario 4, Stabbed, Drug -using Prostitute Needing CPR, Question 7

Immunizations	Low	Moderate	High	Total
YES	2 (2.2%)	4 (4.4%)	85 (93.4%)	91 (87%)
NO	1 (7.1%)	0 (0)%	13 (92.9%)	14 (13%)
Total	3 (2.9%)	4 (3.8%)	98 (93.3%)	105

Summary of p Values

A review of the P values (table 29) clearly indicated that formal education was the only variable found to be statistically significant. The other variables were not significant in influencing the officers' perceptions of risk using these case scenarios.

Table 29 p values

Independent Variables **Scenarios**

VARIABLES	1	2	3	4
Education HIV	*.00413	*.00001	*.00000	.17994
Education HBV	*.00676	*.00000	*.00044	.17978
Experience HIV	.79450	.65759	.62426	.82355
Experience HBV	.97164	.42008	.59491	.28908
Training HIV	.18342	.74047	.93491	.79363
Training HBV	.63293	.53846	.54371	.39018
Immunizations	1.0000	.68167	.51620	1.0000

*** p < .05**

Chapter 5

Summary, Findings, Conclusions, and Recommendations

Summary

The purpose of this study was to measure police officers' levels of perceived risk of occupational exposure to HIV and HBV. Case scenarios were used to determine whether the amount of formal education, series of HIV and HBV training received, experience, and HBV immunizations were significant factors influencing officers' reported level of perceived risk. The scenarios were designed to be similar to actual situations officers may encounter with an increasing degree of HIV and HBV occupational exposure risk. The levels for measuring perceived risk in the four scenarios were high, moderate, and low. Associations were drawn from these reported levels of perceived risk.

A questionnaire was developed through the use of a panel of experts' review and two pilot studies to ensure the face validity of the instrument. The questionnaire was administered to 105 Knoxville City Police officers to gather the descriptive data utilized in addressing the research questions. The questionnaire was administered during roll call and turned in by the officers on their way out to patrol. A SPSSX statistical package was used to analyze the data.

Using Somers'd (yx) measures of association for collapsed ordinal- level data the researcher found that only the independent variable formal education was statistically

significant in its association with the scenarios. The other independent variables: (1) experience, (2) series of training received (concerning HIV and HBV), and (3) HBV immunization status were not statistically significant in their association with the scenarios.

Findings

This section outlines the research findings of the study. Each scenario was examined individually, with the research question focusing on the association between the independent and dependent variables. Each question is listed and the research findings are addressed for each scenario, which involved four separate summaries for each question for a total of 28 findings.

Research Question 1

1. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HIV?

Scenario 1 Findings

The officers' perception of risk in the HIV drug- bust scenario was not independent of educational level. Formal education was statistically significant in its association with perceived risk for scenario 1. Therefore, it was determined that the higher the educational level of the subjects, the lower the perception of risk. For this scenario the independent variable, formal education, was statistically significant in its association with the dependent variable, perceived risk. These findings supported the research question that formal education did influence an officer's level of perceived risk.

Scenario 2 Findings

The officers' perception of risk in the HIV barroom fight scenario was not independent of educational level. Formal education was statistically significant in its association with perceived risk for scenario 2. For this scenario the independent variable, formal education, was statistically significant in its association with perceived risk, the dependent variable for this scenario. These findings supported the research question that formal education did influence an officer's level of perceived risk.

Scenario 3 Findings

The officers' perception of risk in the possibly violent HIV offender scenario was not independent of educational level. Formal education was statistically significant in its association with perceived risk for scenario 3. These findings supported the research question that formal education did influence officers' level of perceived risk.

Scenario 4 Findings

The perceived levels of risks for all educational levels were extremely high for the scenario involving the bloody, unconscious prostitute with drug paraphernalia present. This scenario clearly imposed a high risk of possible HIV occupational exposure, with almost 90 percent of the total sample indicating they perceived this scenario to be high risk. In this scenario where multiple factors of risk to possible occupational exposure were involved, formal education did not make any significant difference in influencing an officer's perceived risk.

Findings for Research Question 1

The officers' perception of risk in scenarios 1, 2, and 3 was not independent of formal education level. Formal education was statistically significant in its association with perceived risk for these scenarios. The only exception was the last scenario, which included multiple high-risk factors relating to possible HIV occupational exposure. A review of these findings indicated the more formal education an officer has, the lower the perceived risk to HIV occupational exposure based on three of these four case scenarios. This indicated that the level of formal education could serve as a predictor in determining how officers may perceive the risk to occupational HIV in certain scenarios.

Research Question 2

2. Does the amount of an officer's formal education influence his or her level of perceived occupational risk to HBV?

Findings Scenario 1

The officers' perception of risk in the drug- bust scenario was not independent of formal educational level. Formal education was statistically significant in its association with perceived HBV risk for scenario 1. Therefore, it was determined that the higher the educational level of the subjects, the lower the perception of risk. These findings supported the research question that formal education did influence officers' level of perceived risk.

Scenario 2 Findings

The officers' perception of HBV risk in the barroom fight scenario was not independent of formal educational level. Formal education was statistically significant in its association with perceived risk for scenario 2. The higher the educational level of the subjects, the lower the perception of HBV risk was found. These findings supported the research question that formal education did influence an officer's level of perceived risk.

Scenario 3 Findings

The officers' perception of risk in the HIV violent offender scenario was not independent of formal educational level. Formal education was statistically significant in its association with perceived risk for scenario 3. These findings supported the research question that formal education did influence an officer's level of perceived risk.

Scenario 4 Findings

The perceived levels of risks for all educational levels were extremely high for the scenario involving the bloody, unconscious prostitute with drug paraphernalia present. Clearly evident of the total sample (N=95 or 90.5%) perceived this scenario as high risk. In this scenario where multiple factors of risk were involved, formal education did not have a significant association in influencing an officer's perceived HBV occupational exposure. This scenario imposes such a high risk of possible HBV occupational exposure that formal education did not influence an officer's risk perception.

Findings for Research Question 2

The officers' perception of risk to scenarios 1, 2, and 3 was not independent of formal education level. Formal education was statistically significant in its association with perceived risk for these scenarios. The only exception was to the last scenario, which included multiple high-risk factors relating to possible HBV occupational exposure. A review of these findings indicated that the more formal education an officer has, the lower the perceived risk to occupational exposure to HBV using three out of four case scenarios. This indicated the level of formal education could serve as a predictor in determining how officers may perceive the risk to occupational HBV in certain scenarios.

Research Question 3

3. Does an officer's amount of experience influence his or her level of perceived occupational risk to HIV?

Scenario 1 Findings

Statistical computations indicated that amount of experience was statistically insignificant in its association with perceived risk in the drug -bust scenario. All categories of experience were similar in the frequency distributions of perceived risk for this variable. A review of these findings indicated amount of experience was not significant in influencing officers' perceived risk in this scenario. These findings supported the research question that amount of experience did not influence an officer's level of perceived risk.

Scenario 2 Findings

Statistical computation indicated amount of experience to be insignificant in influencing officers' perceived HIV risk in the barroom fight scenario. All categories of experience were similar in the frequency distributions of the variable perceived risk. For the purpose of the study, the researcher concluded that amount of experience did not influence an officer's perceived risk in this scenario. These findings supported the research question that experience did not influence an officer's level of perceived risk.

Scenario 3 Findings

Statistical computations indicated amount of experience to be insignificant in influencing officers' perceived risk with the HIV violent offender in this scenario. All categories of experience were similar in the frequency distributions of the variable, perceived risk. These findings supported the research question that experience did not influence an officer's level of perceived risk.

Scenario 4 Findings

Statistical computation indicated amount of experience to be insignificant in influencing officers' perceived risk involving the bloody, unconscious prostitute with drug paraphernalia present. This scenario was reported as a consistent high risk for all three experience-level categories (N=94, or 89.5%) of the total sample. These findings supported the research question that amount of experience did not influence an officer's level of perceived HIV risk.

Research Question 3 Findings

Statistical computation indicated amount of experience to be insignificant in influencing officers' perceived risk to any of the scenarios. For the purpose of the study, the researcher concluded that the independent variable, amount of experience, did not influence an officers' perceived risk in these scenarios. These findings were based on the associations of the independent variable, amount of experience, and dependent variable, perceived risk. These findings supported the research question that amount of experience did not influence an officer's level of perceived risk.

Research Question 4

4. Does an officer's amount of experience influence his or her level of perceived occupational risk to HBV?

Scenario 1 Findings

Statistical computation indicated amount of experience to be insignificant in its association to perceived risk as it relates to the drug bust scenario. The moderate perceived risk category was the dominant choice for all experience levels (N=39, or 39 %) of the total. These findings supported the research question that experience did not influence officers' level of perceived risk.

Scenario 2 Findings

Statistical computations indicated amount of experience to be insignificant in influencing officers' perceived HBV risk in the barroom fight scenario. In this scenario no major frequency-distribution differences were found in the reported levels of

perceived risk. These findings supported the research question that amount of experience did not influence officers' level of perceived HBV risk.

Scenario 3 Findings

Statistical computations indicated amount of experience to be insignificant in the influencing of officers' perceived HBV risk with the violent offender scenario. In this scenario no major frequency-distribution differences were found in the reported perceived HBV risk. These findings supported the research question that experience did not influence an officer's level of perceived HBV.

Scenario 4 Findings

Statistical computation indicated amount of experience to be insignificant in influencing officers' perceived HBV risk involving the bloody, unconscious prostitute with drug paraphernalia present for this scenario. This scenario reported high risk as consistent for all categories of experience levels (N=95%) of the total. These findings supported the research question that amount of experience did not influence an officer's level of perceived HBV risk.

Findings for Research Question 4

Statistical computation indicated amount of experience to be insignificant in influencing officers' perceived HBV risk in any scenario. For the purpose of the study the researcher concluded that amount of experience did not influence an officer's perceived level of HBV risk in this scenario. These findings supported the research question that experience did not influence an officer's level of perceived HBV risk.

Research Question 5

5. Does the amount of an officer's HIV training influence his or her level of perceived occupational risk to HIV?

Scenario 1 Findings

Statistical computation found amount of HIV training to be insignificant in influencing officers' perceived risk in the drug bust scenario. These findings supported the research question that amount of HIV training did not influence an officer's level of perceived risk.

Scenario 2 Findings

Statistical computations found amount of HIV training to be insignificant in influencing officers' perceived risk to HIV in the barroom fight scenario. In this scenario no major frequency-distribution differences were found in the reported perceived risk. For the purpose of this research, the researcher concluded that the amount of HIV training received by officers did not influence their perceived HIV risk.

Scenario 3 Findings

Statistical computations found the amount of HIV training to be insignificant in influencing officers' perceived risk in the violent offender scenario. A review of this frequency distribution indicated that all categories of perceived risk were somewhat similar. For the purpose of this research, it can be concluded that the amount of training received by officers did not influence their perceived risk.

Scenario 4 Findings

Statistical computation found amount of HIV training to be insignificant in influencing officers' perceived risk in this scenario. A review of the frequency distribution of the responses indicated the amount of training regarding HIV made no difference in the amount of perceived risk recorded for this high-risk situation. For the purpose of this research, the researcher concluded that the amount of HIV training received by officers did not influence their perceived risk.

Research Question 5 Findings

Statistical computation indicated the amount of training to be insignificant in influencing officers' perceived HIV risk in all the scenarios. For research purposes, this indicated that the amount of HIV training did not influence an officer's level of perceived risk to HIV using these case scenarios. These findings supported the research question that the amount of HIV training did not influence officers' level of perceived risk.

Research Question 6

5. Does the amount of an officer's HBV training influence his or her level of perceived occupational risk to HBV?

Scenario 1 Findings

Statistical computation found the amount of HBV training to be insignificant in influencing officers' perceived risk in the drug- bust scenario. For the purpose of this research, it was concluded that the amount of HBV training received by officers did not influence their perceived risk of HBV in this scenario. These findings support the

research question that the amount of HBV training did not influence an officer's level of perceived risk.

Scenario 2 Findings

Statistical computation found the amount of HBV training to be insignificant in influencing officers' perceived HBV risk in this scenario. For the purpose of this research, the researcher concluded that the amount of HBV training received by officers did not influence their perceived risk in this scenario. These findings supported the research question that training did not influence an officer's level of perceived risk.

Scenario 3 Findings

Statistical computation found amount of HBV training to be insignificant in influencing officers' perceived HBV risk to this scenario. For the purpose of this research, the researcher concluded that the amount of HBV training received by officers did not influence their perceived risk in this scenario. These findings supported the research question that training did not influence an officer's level of perceived risk.

Scenario 4 Findings

Statistical computation found HBV training to be insignificant in influencing officers' perceived risk to this scenario. A review of the frequency distribution of the responses indicated the number of trainings received made no difference in the amount of perceived risk to this high-risk situation. For the purpose of this research, the researcher concluded that the amount of HBV training received by officers did not influence their perceived risk.

Research Question 6 Findings

Statistical computation indicated amount of experience to be insignificant in influencing officers' perceived HBV risk in any scenario. For research purposes, this indicated that HBV training did not influence an officer's level of perceived risk to HBV using these case scenarios. These findings supported the research question that the amount of HBV training did not influence officers' level of perceived risk.

Research Question 7

7. Do HBV-immunized officers have significant differences in their level of perceived occupational risk?

Scenario 1 Findings

Statistical computation found HBV immunization to be insignificant in influencing officers' perceived HBV risk in the drug- bust scenario. Frequency distribution concerning officers who have been HBV immunized differed little from those who were not immunized. The overwhelming number of officers had been immunized (N=91, or 87%), so generalizations made should consider this the majority. For the purpose of this research, the researcher concluded that HBV immunizations did not influence officers' perceived risk.

Scenario 2 Findings

Statistical computation found HBV immunization to be insignificant in influencing officers' perceived HBV risk in the barroom fight scenario. For the

purpose of this research, the researcher concluded that HBV immunizations did not influence officers' perceived risk.

Scenario 3 Findings

Statistical computation found HBV immunization to be insignificant in influencing officers' perceived HBV risk in the violent offender scenario. Frequency distribution concerning officers who have been HBV immunized differed little from those who were not immunized in comparing their perceived level of risk in this scenario. For the purposes of this research, the researcher concluded that HBV immunization did not influence officers' perceived risk.

Scenario 4 Findings

Statistical computation found HBV immunization to be insignificant in influencing officers' perceived HBV risk to the bloody, unconscious prostitute scenario. Frequency distribution concerning officers who have been HBV immunized differed little from those who were not immunized in comparing their perceived level of risk to this scenario. For the purpose of this research, the researcher concluded that HBV immunization did not influence officers' perceived risk.

Research Question 7 Findings

These findings were based on the collapsed ordinal data of the independent variable, HBV immunizations, as defined in the previous chapter. If an officer had at least one immunization , he or she was considered immunized. The results

indicated HBV immunization was not significant in its association to recorded levels of perceived risk to these scenarios. For the purpose of this research, it was concluded that HBV immunization did not influence officers' perceived risk to occupational exposure HBV in this scenario. It must be noted that the majority (87%) of the total was immunized.

Conclusions

Based upon the findings, the following conclusions were made:

1. Knoxville Police patrol officers were influenced by their level of formal education attained. The degree of significance that formal education has on police officers can only be estimated using this ordinal-level data. A review of these findings indicated the more formal education an officer has, the lower the perceived risk to HIV occupational exposure based on three of these four case scenarios. The level of formal education did not influence the officers in situations of extremely high perceived risk to occupational exposure to HIV.
2. Knoxville Police patrol officers were influenced by their formal education. The degree of significance that formal education has on police officers can only be estimated using this ordinal-level data. A review of these findings indicated the more formal education an officer has, the lower the perceived risk to HBV occupational exposure based on three of these four case scenarios. The level of formal education did not influence the officers in

situations of extremely high perceived risk to occupational exposure to HBV.

3. Knoxville Police officers were not influenced by their years of service in law enforcement as indicated by their responses to occupational risk to HIV. The recorded perceived levels of risk to the scenarios indicated amount of experience not to be significant using these case scenarios.

4. Knoxville Police officers were not influenced by their years of service in law enforcement as indicated by their responses to occupational risk to HBV. The recorded perceived levels of risk to the scenarios indicated amount of experience not to be significant using these case scenarios.

5. The number of times Knoxville Police patrol officers received training concerning HIV or HBV did not influence their perceived risk to occupational exposure to HIV using these case scenarios.

6. The number of times Knoxville Police patrol officers received training concerning HIV or HBV did not influence their perceived risk to occupational exposure to HBV using these case scenarios.

7. Knoxville Police patrol officers who have received the HBV vaccination did not have a different level of perceived risk to occupational exposure compared to those not immunized to HBV using these case scenarios.

Recommendations

On the basis of the literature review and the findings from this study, the following recommendations are offered for future research:

1. Formal education can serve as predictor as to how officers may perceive the actual occupational risk involving situations of possible exposure to HIV and HBV. This would merit that police departments hire only college-educated officers in order to reduce the departments' overall liability.
2. The hiring of college graduates would reduce training costs in the area of bloodborne pathogen training as required by OSHA and the ICAP.
3. Training for bloodborne pathogens should be targeted to different levels of formal education. The major finding of this study was that distinct levels of formal education reported differences in perceived risk. Training for less formally educated officers would likely require a different approach to adequately train these officers.
4. Bloodborne pathogen training should be offered more consistently and be geared toward specific law enforcement issues in situations that actually occur. It was apparent in this study that officers' who participated in the survey felt they were at some risk to being occupationally exposed to HIV and / or HBV. Training geared toward police officers and their occupational responsibilities in a timely manner may reduce many misconceptions formed from outside influences.

CHAPTER 6

The Study in Retrospect

The original idea for this study came from real-life situations involving occupational exposure to HIV and HBV. Working with violent juvenile sex offenders created many opportunities for this researcher to be exposed to bloodborne pathogens. After reviewing much literature, it became apparent very little descriptive data were available which assessed the perceived risk of occupational exposure to HIV and HBV. The first target population of this study was correctional officers, but law enforcement officers were determined to be a more accessible population because they faced a wider range of situations involving occupational exposure. The variables of formal education, experience, amount of HIV and HBV training received, and HBV immunizations were compared to four case scenarios that law enforcement officers may face.

Strengths of the Investigation

The study offered a large quantity of descriptive data comparing officers' levels of reported risk in four case scenarios. One finding was that law enforcement officers do think the risk to HIV and HBV occupational exposure exists. This information may aid in the development of training procedures that take these factors into consideration. The literature review clearly indicated that training is the best way to reduce fears and the spread of misinformation concerning these infections. The review also indicated that limited training might account for an overall perception of high risk. Replication of this

study would be fairly easy and would allow researchers to change the scenarios as needed. Case scenarios may offer training personnel a variety of ways to determine what situation officers fear most. Further research may reinforce the important influence that such training can have in reducing officers' fears regarding the occupational risk these diseases represent.

Limitations of the Investigation

The fact that this research used non-parametric data limited the degree of study generalization. All findings could only be generalized to the population sampled, Knoxville City patrol officers. The population of police officers sampled was homogenous to the area, but a more diverse heterogeneous police department may find significant differences among the variables examined for this study. The case scenarios used for this study provoked a high risk of possible occupational exposure in each scenario. The use of scenarios that are less threatening concerning the level of perceived risk to possible occupational exposure would allow for a closer look at more common everyday situations. These suggestions may give researchers a better understanding of how certain variables can influence officers in particular situations. The way the variables were operationally defined for this study limited the variables under review to some degree. The variable, formal education, was operationally defined without taking into account those who had almost finished a degree. The variable experience was limited to reported years of law enforcement experience without taking into account similar experiences that may have influenced an officer, such as experience in a correctional

setting. Asking more about the type of training received and content of training rather than the number of training series received might have produced different results for this variable. Research supports training as an effective tool in reducing police officers' fears concerning bloodborne pathogens. A closer review of the time frames and curricula reported by these officers may have provided different results. The questionnaire was limited to gathering descriptive demographic data without making inferences to attitudes concerning the viruses HIV and HBV. It would have been interesting to look at the officers' attitudes concerning HIV and HIV in comparison to how they perceived the risks to the scenarios. The findings may not accurately determine how much each of the variables, in conjunction with each other, actually influences an officer's perception of overall risk. Studies of this type are limited in nature as to the generalizations that can be made. Statistical analyses for small sample sizes or response rates limited certain categories. This was especially true for the officers who were not HBV immunized since 90 percent had been immunized.

Significance of the Study

Police officers are aware of the perceived risks represented by occupational exposure to HIV and HBV. The findings indicated the more formal education an officer has, the lower the perceived risk to HIV and HBV occupational exposure. The fact that none of the other variables were statistically significant indicates that formal education can serve as a good predicator concerning how officers perceive risks involving occupational exposure to HIV and HBV. A better understanding of the factors that

influence an officer's perceived risk may allow for training that prepares officers to adequately address situations that put them at risk. The fact that the incidence of HIV and HBV is increasing will lead to more occupational encounters that place officers at risk. This alone should be enough to stimulate training personnel to look at the importance of including HIV and HBV risk education in designing training curricula. Reducing the fears of such risks can only provide a better quality of service rendered by law enforcement personnel in emergency or crisis situations.

References

Barr, J. K., & Warshaw, L. (1994). Worksite AIDS Education; A Case Study at the New York Police. AIDS Education and Prevention 6(1), 53-64.

Baxter, S. (1991). AIDS Education in the Jail Setting. Crime and Delinquency vol. 37 no. 1, Jan., 48-63.

Bigbee, D. (1993). Pathogenic Microorganisms: Law Enforcement's Silent Enemies. FBI Law Enforcement Bulletin May 62 *(5),* 1-5.

Brien, P. & A. Beck (1996). HIV in Prisons. U.S. Department of Justice. Bureau of Justice Statistics. March.

Centers for Disease Control (1987). Morbidity and Mortality Weekly Report, Weekly Report vol. 36 No. 1.

Centers for Disease Control (1992). Morbidity and Mortality Weekly Report, Weekly Report vol. 27 No. 1

Centers for Disease Control (1996). Morbidity and Mortality Weekly Report, Weekly Report vol. 19 No. 2

Centers for Disease Control (1993) Morbidity and Mortality Weekly Report, Weekly Report vol. 42 No. 17.

Centers for Disease Control (1995) Morbidity and Mortality Weekly Report, vol. 43 No. 12 p. 317-321.

Centers for Disease Control (1997). Morbidity and Mortality Weekly Report, vol. 46 No. 46 p. 480-482.

Centers for Disease Control (1981). Morbidity and Mortality Weekly Report, vol. 8 No. 6

Centers for Disease Control (1995). Case-Control Study Of HIV Seroconversion in Health-Care Workers After Percutaneous Exposure to HIV-Infected Blood in France, United Kingdom and the United States Morbidity and Mortality Weekly Report vol. 44 No. *50* p. 929-33.

Centers for Disease Control (1987). Revision of the CDC Surveillance Case Definition for Acquired Immunodeficiency Syndrome Morbidity and Mortality Weekly Report, vol. 36 No. 1.

Centers for Disease Control (1987). Human Immunodeficiency Virus Infection in the United States: Morbidity and Mortality Weekly Report, vol. 36 No.51.

Centers for Disease Control (1991). Human Immunodeficiency Virus Infection in the United States: A Review of Current Knowledge: Morbidity and Mortality Weekly Report, 36 (Supplement. No. 15): 35-75.

Centers for Disease Control Update: (1987). Acquired Immunodeficiency Syndrome in the United States: Morbidity Mortality Weekly Report vol. 36:285-289.

Centers for Disease Control (1996). 1996 State Health Profiles, U.S. Department of Health and Human Services.

Centers for Disease Control & National Institutes for Occupational Safety and Health (1989). Guidelines for Prevention of Transmission of HIV and HBV to Health

Care and Public Safety Workers. Atlanta: Department of Health and Human Services, Public Health Service, February.

Centers for Disease Control (1989). HIV/AIDS Surveillance. Atlanta: US Public of Health Service, March.

Centers for Disease Control and Prevention (1994). HIV/AIDS Surveillance Report, 6(2).

Champion, D. J. (1981). Basic Statistics for Social Research. New York: Macmillan Publishing.

Decker, S. H. & Rosenfeld, R. (1992). Intravenous Drug Use and the AIDS Epidemic: Findings From a 20-City Sample of Arrestees. Crime & Delinquency 38, 492-509.

Department of Labor & Occupational Safety and Health Administration (1991). Occupational Exposure to Bloodborne pathogens29 CFR 1910.1310 Washington DC: Department of Labor, Occupational Safety and Health Administration.

Diclemente, R. J. & Zorn, J. (1988). Adolescents and AIDS: A Survey of Knowledge, Attitudes and Beliefs about AIDS in San Francisco. American Journal of Public Health, vol. 76, 143-55.

Doe v. Borough of Barrington 729 F. Supplement. 376 (DNT. 1990).

Edwards, T. & Tewksbury, R. (1994). Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS): State Police Training

Practices and Personnel Policies Presented at the 1994 Annual Meeting of Southern Criminal Justices Association.

Estate of Behringer v. Princeton Medical Center. (1990) 592 A. zd. 1251.

Fauci, A. S. (1986). Current Issues in Developing a Strategy for Dealing with the Acquired Immunodeficiency Syndrome. Proceedings of the National Academy of Science, vol. 83, p. 9278-9283.

Friedland, G., & Klein, R. (1987). Transmission of the Human Immunodeficiency Virus. The New England Journal of Medicine, 11, 317.

Gallo, R. (1988). AIDS in 1988. Scientific American October p. 21-38.

Gerberding, J. (1988). Occupational Health Issues for Providers of Care to Patients with HIV Infection. In M. Sande and P. Volberding (eds.) The Medical Management of AIDS. (pp.139-174) Philadelphia: W. B. Saunders.

Hammett, T. (1989). 1988 Update: Aids in Correctional Facilities. Washington DC: National Institute of Justice.

Hammett, T. (1988). AIDS in Correctional Facilities: Issues and Options. Washington DC: Department of Justice.

Hammett, T. (1987). AIDS and the Law Enforcement Officer: Concerns and Policy Responses. Washington DC: US Department of Justice, National Institute of Justice.

Hammett,T., Hunt, D., Gross, M., Rhodes, W., & Moini S. (1991). Stemming the spread of HIV among IV drug users, their sexual partners and children: Issues and

opportunities for criminal justice agencies. Crime and Delinquency 37 (1)101-124.

Hammett, T., Harrold, L., Gross, M., & Epstein J. (1994). 1992 Update: HIV/AIDS in correctional facilities. Washington, DC: National Institute of Justice.

Handleman, E. Y. (1992). Hepatitis B Vaccine Education Programs What Really Works A AOHN Journal: *40 (6)*, 263-270.

Healy, J. F. (1993). Statistics A Tool For Social Services Belmont California: Wadsworth Publishing.

Hser, Y., Longshore, D., & M. D. Anglin. (1994). HIV, drug-use paraphernalia, and bleach. Journal of Acquired Immune Deficiency Syndrome vol.7, 741-742.

Incardi, J. A. (1990). Aids and Drug Use: Implications for Criminal Justice Policy. In Drugs Crime and the Criminal Justice System, p.303-28.Cincinnati,Ohio. Anderson.

Jarvis, R. M., Closen, M. L.,. Hermann H. J. & A. S. Leonard (1991). AIDS Law in Nutshell. St. Paul: West Publishing.

Laszlo, A. & Ayers, M.(1986). AIDS: Improving the Response of the Criminal Justice System. National Sheriff's Association. Alexandria, VA.

Laszlo, A., & Smith, B.(1991). Evaluating Criminal Justice Training Addressing AIDS Policy. Crime and Delinquency. vol. 37 no. 1., 19-35.

Lurigio, A., Petraitis, J. &. Johnson, B. (1991). HIV Education for Probation Officers: An Implementation and Evaluation Program. Crime and Delinquency. vol. 37 no. 1., 125-134.

Jagger,J & Pearson, J. (1991). Universal precautions: still missing the point on needle sticks Infection Control Hospital Epidemiology vol 12 p. 211-3.

Knox County Health Department - Personal Communication. March 1997

Marcus, R. (1988). CDC Cooperative Needlestick Surveillance Group: Surveillance of Health Care Workers Exposed to Blood from Patients Infected with the Human Immunodeficiency Virus. N. England Journal of Medicine. Vol. 319, 1118-23.

Magura, S., Rosenblum, A. & Joseph H. (1991). AIDS Risk Among Intravenous Drug-Using Offenders. Crime & Delinquency 37(1), 86-100.

McBride, D.C. &. Inciardi J. A. (1990). AIDS and the IV drug user in the criminal justice system. Journal of Drug Issues 20(2), 267-280.

Muffler, S., (1992). Compassion and Caution: Surveying and Assessing AIDS Policies and Procedures Used by Law Enforcement Personnel Florida Department of Law Enforcement.

National Institute of Justice (1992). Drug Use Forecasting Annual Report: US Department of Justice. Washington D.C.

Neutens, J.& , L. Rubinson. (1987). Research Techniques for the Health and Sciences. New York: Macmillan Publishing Company.

Ohio State Highway Patrol (1991). HIV-HBV Transmission United States Technical Assistance Reports. Cleveland.

Perkins, C.A., Stephan J. J. & Beck. A. J. (1995). Jails and jail inmates, 1993-94. Bureau of Justice Statistics Bulletin. Washington, D.C.

Royse, D., Dhooper, S. & Hatch L. (1987). Undergraduate and Graduate Students' Attitudes Towards AIDS. Psychological Reports, 60, p. 1185-1186.

Siegal, H.A., Wang, J., Forney, M R., Falck, S., Carlson R. G. & D. C. McBride. (1994). Incarceration and HIV Risk Behaviors Among Injection Drug Users: A Midwestern Case Study. Journal of Crime and Justice 17, 85-101.

Slovic, P.(1991). Regulations of Risk: A Psychological Perspective Regulatory Policy and Social Sciences. Berkeley University of California Press.

Srivastava ,M.R., Bell, D.M., McKibben, P.S., Kelen, G.D. & R.J.Zalenski (1995). Occupational blood contact among prehospital providers Annals Emergency Medicine 6; *25(6)*, 776-9.

Steward, J. D. (1993). BloodborneDisease: Developing a Training Curriculum. FBI Law Enforcement Bulletin vol. 62 no. 5 pp. 11-15.

Tennessee Department of Health, STD/HIV Program, Surveillance Section Vol.3 no.3 May 31, 1997.

Tewksbury, R., Vito, G. & Cummings S. (1995). Injection Drug Users and HIV Risk Behaviors: The Criminal Justice Professionals' Role in Identifying and

Responding to Multifaceted Risk Behaviors. Paper presented at Southern Criminal Justice Association.

US Department of Health and Human Services (1989). A Curriculum Guide for Public Safety and Emergency Response Workers, US Department of Health and Human Services, Centers for Disease Control, Atlanta

US Department of Health and Human Services (1994). HIV/AIDS Surveillance Report 5(4): US Department of Health and Human Services, Centers for Disease Control. Atlanta

World Health Organization (1991). Consultation on Prevention and Control of AIDS. Lancet Nov. 88, p. 1263-64.

World Health Organization (1997). Weekly Epidemiological Record vol.72 p.17-24.

West, K. (1992). Assessing the Risks Emergency March p. 30-33

Yearwood, D., (1992). Law Enforcement and AIDS: Knowledge, Knowledge, Attitudes, and Fears in the Workplace American Journal of Police 11(2), 65-83.

Zimmerman, S. E., Martin R. & Vlahov D. (1991). AIDS Knowledge and Risk Perceptions Among Pennsylvania Prisoners Journal of Criminal Justice Vol. 52 No. 1, 65-82.

Appendices

Appendix A

Occupational Exposure Guidelines

Code of Federal Register 29 1910. 1010

rinsed with nanograde benzene before use. The Teflon cups are cleaned with benzene then with acetone.

2. Pre-weigh the 2 ml Teflon cups to one hundredth of a milligram (0.01 mg) on a autobalance AD 2. Tare weight of the cups is about 50 mg.

3. Place the silver membrane filter and glass fiber filter into a 15 ml test tube.

4. Extract with 5 ml of benzene for five minutes in an ultrasonic cleaner.

5. Filter the extract in 15 ml medium glass fritted funnels.

6. Rinse test tube and filters with two 1.5 ml aliquots of benzene and filter through the fritted glass funnel.

7. Collect the extract and two rinses in a 10 ml Kontes graduated evaporative concentrator.

8. Evaporate down to 1 ml while rinsing the sides with benzene.

9. Pipet 0.5 ml into the Teflon cup and evaporate to dryness in a vacuum oven at 60° C for 3 hours.

10. Weigh the Teflon cup and the weight gain is due to the benzene soluble residue in half the Sample.

III. MEDICAL SURVEILLANCE GUIDELINES

A. *General.*

The minimum requirements for the medical examination for coke oven workers are given in paragraph (j) of the standard.

The initial examination is to be provided to all coke oven workers who work at least 30 days in the regulated area. The examination includes at 14" X 17" posterior-anterior chest x-ray and a ILO-UC rating to assure some standardization of x-ray reading, pulmonary function tests (FVC and FEV 1.0), weight, urinalysis, skin examination and a sputum and urinary cytologic examination. These tests need serve as the baseline for comparing the employee's future test results. Periodic exams include all the elements of the initial exams except that the cytologic tests are to be performed only on those employees who are 45 years of age or older or who have worked for 5 or more years in the regulated area; periodic exams are to be performed semiannually for this group instead of annually. The examination contents are minimum requirements, additional tests such as lateral and oblique x-rays or additional pulmonary function tests may be performed if deemed necessary.

B. *Pulmonary function tests.*

Pulmonary function tests should be performed in a manner which minimizes subject and operator bias. There has been shown to be learning effects with regard to the results obtained from certain tests, such as FEV 1.0. Best results can be obtained by multiple trials for each subject. The best of three trials or the average of the last three of five trials may be used in obtaining reliable results. The type of equipment used (manufacturer, model, etc.) should be recorded with the results as reliability and accuracy varies and such information may be important in the evaluation of test results. Care should be exercised to obtain the best possible testing equipment.

C. *Sputum cytology.*

Sputum can be collected by aerosol inhalation during the medical exam or by spontaneous early morning cough at home. Sputum is induced by transoral inhalation of an aerosolized solution of eight percent (8%) sodium chloride in water. After inhaling as few as three to five breaths the subject usually yields an adequate sputum specimen. A minimum of three samples should be collected by the subject at home. All sputum should be collected directly into sixty percent (60%) alcohol.

Scientific evidence suggests that chest x-rays and sputum cytology should be used together as screening tests for lung cancer in high risk populations, such as coke oven workers. The tests are to be performed every six months on workers who are 45 years of age or older or have worked in the regulated area for 5 or more years. Since the tests seem to be complementary, it may be advantageous to alternate the test procedures. For instance, chest x-rays could be obtained in June and December and sputum cytology could be obtained in March and September. Facilities for providing necessary diagnostic investigation should be readily available as well as chest physicians, surgeons, radiologists, pathologists and immunotherapists to provide any necessary treatment services.

[41 FR 46784, Oct. 22, 1976, as amended at 42 FR 3304, Jan. 18, 1977; 45 FR 35283, May 23, 1980; 50 FR 37253, 37354, Sept. 13, 1985; 54 FR 24334, June 7, 1989]

§ 1910.1030 Bloodborne pathogens.

(a) *Scope and Application.* This section applies to all occupational exposure to blood or other potentially infectious materials as defined by paragraph (b) of this section.

(b) *Definitions.* For purposes of this section, the following shall apply:

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, or designated representative.

Blood means human blood, human blood components, and products made from human blood.

Bloodborne Pathogens means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Clinical Laboratory means a workplace where diagnostic or other screening procedures are performed on blood or other potentially infectious materials.

Contaminated means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry means laundry which has been soiled with blood or other potentially infectious materials or may contain sharps.

Contaminated Sharps means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Decontamination means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Director means the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designated representative.

Engineering Controls means controls (e.g., sharps disposal containers, self-sheathing needles) that isolate or remove the bloodborne pathogens hazard from the workplace.

Exposure Incident means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Handwashing Facilities means a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

Licensed Healthcare Professional is a person whose legally permitted scope of practice allows him or her to independently perform the activities required by paragraph (f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

HBV means hepatitis B virus.

HIV means human immunodeficiency virus.

Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials means

(1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;

(2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and

(3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Parenteral means piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Production Facility means a facility engaged in industrial-scale, large-volume or high concentration production of HIV or HBV.

Regulated Waste means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Research Laboratory means a laboratory producing or using research-lab-

oratory-scale amounts of HIV or HBV. Research laboratories may produce high concentrations of HIV or HBV but not in the volume found in production facilities.

Source individual means any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the developmentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains; and individuals who donate or sell blood or blood components.

Sterilize means the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls means controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

(c) *Exposure control*—(1) *Exposure Control Plan.* (i) Each employer having an employee(s) with occupational exposure as defined by paragraph (b) of this section shall establish a written Exposure Control Plan designed to eliminate or minimize employee exposure.

(ii) The Exposure Control Plan shall contain at least the following elements:

(A) The exposure determination required by paragraph(c)(2),

(B) The schedule and method of implementation for paragraphs (d) Methods of Compliance, (e) HIV and HBV Research Laboratories and Production Facilities, (f) Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up, (g) Communication of Hazards to Employees, and (h) Recordkeeping, of this standard, and

(C) The procedure for the evaluation of circumstances surrounding exposure incidents as required by paragraph (f)(3)(i) of this standard.

(iii) Each employer shall ensure that a copy of the Exposure Control Plan is accessible to employees in accordance with 29 CFR 1910.20(e).

(iv) The Exposure Control Plan shall be reviewed and updated at least annually and whenever necessary to reflect new or modified tasks and procedures which affect occupational exposure and to reflect new or revised employee positions with occupational exposure.

(v) The Exposure Control Plan shall be made available to the Assistant Secretary and the Director upon request for examination and copying.

(2) *Exposure determination.* (i) Each employer who has an employee(s) with occupational exposure as defined by paragraph (b) of this section shall prepare an exposure determination. This exposure determination shall contain the following:

(A) A list of all job classifications in which all employees in those job classifications have occupational exposure;

(B) A list of job classifications in which some employees have occupational exposure, and

(C) A list of all tasks and procedures or groups of closely related task and procedures in which occupational exposure occurs and that are performed by employees in job classifications listed in accordance with the provisions of paragraph (c)(2)(i)(B) of this standard.

(ii) This exposure determination shall be made without regard to the use of personal protective equipment.

(d) *Methods of compliance*—(1) *General*—Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

(2) *Engineering and work practice controls.* (i) Engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after institution of these controls, personal protective equipment shall also be used.

(ii) Engineering controls shall be examined and maintained or replaced on

a regular schedule to ensure their effectiveness.

(iii) Employers shall provide handwashing facilities which are readily accessible to employees.

(iv) When provision of handwashing facilities is not feasible, the employer shall provide either an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes. When antiseptic hand cleansers or towelettes are used, hands shall be washed with soap and running water as soon as feasible.

(v) Employers shall ensure that employees wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment.

(vi) Employers shall ensure that employees wash hands and any other skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials.

(vii) Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed except as noted in paragraphs (d)(2)(vii)(A) and (d)(2)(vii)(B) below. Shearing or breaking of contaminated needles is prohibited.

(A) Contaminated needles and other contaminated sharps shall not be bent, recapped or removed unless the employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure.

(B) Such bending, recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

(viii) Immediately or as soon as possible after use, contaminated reusable sharps shall be placed in appropriate containers until properly reprocessed. These containers shall be:

(A) Puncture resistant;

(B) Labeled or color-coded in accordance with this standard;

(C) Leakproof on the sides and bottom and

(D) In accordance with the requirements set forth in paragraph (d)(4)(ii)(E) for reusable sharps.

(ix) Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.

(x) Food and drink shall not be kept in refrigerators, freezers, shelves, cabinets or on countertops or benchtops where blood or other potentially infectious materials are present.

(xi) All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

(xii) Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.

(xiii) Specimens of blood or other potentially infectious materials shall be placed in a container which prevents leakage during collection, handling, processing, storage, transport, or shipping.

(A) The container for storage, transport, or shipping shall be labeled or color-coded according to paragraph (g)(1)(i) and closed prior to being stored, transported, or shipped. When a facility utilizes Universal Precautions in the handling of all specimens, the labeling/color-coding of specimens is not necessary provided containers are recognizable as containing specimens. This exemption only applies while such specimens/containers remain within the facility. Labeling or color-coding in accordance with paragraph (g)(1)(i) is required when such specimens/containers leave the facility.

(B) If outside contamination of the primary container occurs, the primary container shall be placed within a second container which prevents leakage during handling, processing, storage, transport, or shipping and is labeled or color-coded according to the requirements of this standard.

(C) If the specimen could puncture the primary container, the primary container shall be placed within a secondary container which is puncture-resistant in addition to the above characteristics.

(xiv) Equipment which may become contaminated with blood or other potentially infectious materials shall be examined prior to servicing or shipping and shall be decontaminated as necessary, unless the employer can dem-

onstrate that decontamination of such equipment or portions of such equipment is not feasible.

(A) A readily observable label in accordance with paragraph (g)(1)(i)(H) shall be attached to the equipment stating which portions remain contaminated.

(B) The employer shall ensure that this information is conveyed to all affected employees, the servicing representative, and/or the manufacturer, as appropriate, prior to handling, servicing, or shipping so that appropriate precautions will be taken.

(3) *Personal protective equipment*—(i) Provision. When there is occupational exposure, the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

(ii) Use. The employer shall ensure that the employee uses appropriate personal protective equipment unless the employer shows that the employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances, it was the employee's professional judgment that in the specific instance its use would have prevented the delivery of health care or public safety services or would have posed an increased hazard to the safety of the worker or co-worker. When the employee makes this judgement, the circumstances shall be investigated and documented in order to determine whether changes can be instituted to prevent such occurences in the future.

(iii) Accessibility. The employer shall ensure that appropriate personal protective equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.

(iv) Cleaning, Laundering, and Disposal. The employer shall clean, launder, and dispose of personal protective equipment required by paragraphs (d) and (e) of this standard, at no cost to the employee.

(v) Repair and Replacement. The employer shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employee.

(vi) If a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) shall be removed immediately or as soon as feasible.

(vii) All personal protective equipment shall be removed prior to leaving the work area.

(viii) When personal protective equipment is removed it shall be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.

(ix) Gloves. Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; when performing vascular access procedures except as specified in paragraph (d)(3)(ix)(D); and when handling or touching contaminated items or surfaces.

(A) Disposable (single use) gloves such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.

(B) Disposable (single use) gloves shall not be washed or decontaminated for re-use.

(C) Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

(D) If an employer in a volunteer blood donation center judges that routine gloving for all phlebotomies is not necessary then the employer shall:

(*1*) Periodically reevaluate this policy;

(*2*) Make gloves available to all employees who wish to use them for phlebotomy;

(*3*) Not discourage the use of gloves for phlebotomy; and

(*4*) Require that gloves be used for phlebotomy in the following circumstances:

(*i*) When the employee has cuts, scratches, or other breaks in his or her skin;

(*ii*) When the employee judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative source individual; and

(*iii*) When the employee is receiving training in phlebotomy.

(x) Masks, Eye Protection, and Face Shields. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.

(xi) Gowns, Aprons, and Other Protective Body Clothing. Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.

(xii) Surgical caps or hoods and/or shoe covers or boots shall be worn in instances when gross contamination can reasonably be anticipated (e.g., autopsies, orthopaedic surgery).

(4) *Housekeeping.* (i) General. Employers shall ensure that the worksite is maintained in a clean and sanitary condition. The employer shall determine and implement an appropriate written schedule for cleaning and method of decontamination based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.

(ii) All equipment and environmental and working surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.

(A) Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures; immediately or as soon as feasible when surfaces are overtly contaminated or after any spill of blood or other potentially infectious materials; and at the end of the work shift if the surface may have become contaminated since the last cleaning.

(B) Protective coverings, such as plastic wrap, aluminum foil, or impervious-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the workshift if they may have become contaminated during the shift.

(C) All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.

(D) Broken glassware which may be contaminated shall not be picked up directly with the hands. It shall be cleaned up using mechanical means, such as a brush and dust pan, tongs, or forceps.

(E) Reusable sharps that are contaminated with blood or other potentially infectious materials shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.

(iii) Regulated Waste.

(A) Contaminated Sharps Discarding and Containment. (*1*) Contaminated sharps shall be discarded immediately or as soon as feasible in containers that are:

(*i*) Closable;

(*ii*) Puncture resistant;

(*iii*) Leakproof on sides and bottom, and

(iv) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard.

(2) During use, containers for contaminated sharps shall be:

(i) Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found (e.g., laundries);

(ii) Maintained upright throughout use; and

(iii) Replaced routinely and not be allowed to overfill.

(3) When moving containers of contaminated sharps from the area of use, the containers shall be:

(i) Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping;

(ii) Placed in a secondary container if leakage is possible. The second container shall be:

(A) Closable;

(B) Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping; and

(C) Labeled or color-coded according to paragraph (g)(1)(i) of this standard.

(4) Reusable containers shall not be opened, emptied, or cleaned manually or in any other manner which would expose employees to the risk of percutaneous injury.

(B) Other Regulated Waste Containment. (1) Regulated waste shall be placed in containers which are:

(i) Closable;

(ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;

(iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) this standard; and

(iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

(2) If outside contamination of the regulated waste container occurs, it shall be placed in a second container. The second container shall be:

(i) Closable;

(ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;

(iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard; and

(iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

(C) Disposal of all regulated waste shall be in accordance with applicable regulations of the United States, States and Territories, and political subdivisions of States and Territories.

(iv) Laundry.

(A) Contaminated laundry shall be handled as little as possible with a minimum of agitation. (1) Contaminated laundry shall be bagged or containerized at the location where it was used and shall not be sorted or rinsed in the location of use.

(2) Contaminated laundry shall be placed and transported in bags or containers labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard. When a facility utilizes Universal Precautions in the handling of all soiled laundry, alternative labeling or color-coding is sufficient if it permits all employees to recognize the containers as requiring compliance with Universal Precautions.

(3) Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through of or leakage from the bag or container, the laundry shall be placed and transported in bags or containers which prevent soak-through and/or leakage of fluids to the exterior.

(B) The employer shall ensure that employees who have contact with contaminated laundry wear protective gloves and other appropriate personal protective equipment.

(C) When a facility ships contaminated laundry off-site to a second facility which does not utilize Universal Precautions in the handling of all laundry, the facility generating the contaminated laundry must place such laundry in bags or containers which are labeled or color-coded in accordance with paragraph (g)(1)(i).

(e) *HIV and HBV Research Laboratories and Production Facilities.* (1) This paragraph applies to research laboratories and production facilities engaged in the culture, production, concentration, experimentation, and manipulation of HIV and HBV. It does not apply to clinical or diagnostic laboratories engaged solely in the analysis of blood, tissues, or organs. These requirements apply in addition to the other requirements of the standard.

(2) Research laboratories and production facilities shall meet the following criteria:

(i) Standard microbiological practices. All regulated waste shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy bloodborne pathogens.

(ii) Special practices.

(A) Laboratory doors shall be kept closed when work involving HIV or HBV is in progress.

(B) Contaminated materials that are to be decontaminated at a site away from the work area shall be placed in a durable, leakproof, labeled or color-coded container that is closed before being removed from the work area.

(C) Access to the work area shall be limited to authorized persons. Written policies and procedures shall be established whereby only persons who have been advised of the potential biohazard, who meet any specific entry requirements, and who comply with all entry and exit procedures shall be allowed to enter the work areas and animal rooms.

(D) When other potentially infectious materials or infected animals are present in the work area or containment module, a hazard warning sign incorporating the universal biohazard symbol shall be posted on all access doors. The hazard warning sign shall comply with paragraph (g)(1)(ii) of this standard.

(E) All activities involving other potentially infectious materials shall be conducted in biological safety cabinets or other physical-containment devices within the containment module. No work with these other potentially infectious materials shall be conducted on the open bench.

(F) Laboratory coats, gowns, smocks, uniforms, or other appropriate protective clothing shall be used in the work area and animal rooms. Protective clothing shall not be worn outside of the work area and shall be decontaminated before being laundered.

(G) Special care shall be taken to avoid skin contact with other potentially infectious materials. Gloves shall be worn when handling infected animals and when making hand contact with other potentially infectious materials is unavoidable.

(H) Before disposal all waste from work areas and from animal rooms shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy bloodborne pathogens.

(I) Vacuum lines shall be protected with liquid disinfectant traps and high-efficiency particulate air (HEPA) filters or filters of equivalent or superior efficiency and which are checked routinely and maintained or replaced as necessary.

(J) Hypodermic needles and syringes shall be used only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., the needle is integral to the syringe) shall be used for the injection or aspiration of other potentially infectious materials. Extreme caution shall be used when handling needles and syringes. A needle shall not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe shall be promptly placed in a puncture-resistant container and autoclaved or decontaminated before reuse or disposal.

(K) All spills shall be immediately contained and cleaned up by appropriate professional staff or others properly trained and equipped to work with potentially concentrated infectious materials.

(L) A spill or accident that results in an exposure incident shall be immediately reported to the laboratory director or other responsible person.

(M) A biosafety manual shall be prepared or adopted and periodically reviewed and updated at least annually or more often if necessary. Personnel shall be advised of potential hazards, shall be required to read instructions on practices and procedures, and shall be required to follow them.

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(iii) Containment equipment. (A) Certified biological safety cabinets (Class I, II, or III) or other appropriate combinations of personal protection or physical containment devices, such as special protective clothing, respirators, centrifuge safety cups, sealed centrifuge rotors, and containment caging for animals, shall be used for all activities with other potentially infectious materials that pose a threat of exposure to droplets, splashes, spills, or aerosols.

(B) Biological safety cabinets shall be certified when installed, whenever they are moved and at least annually.

(2) HIV and HBV research laboratories shall meet the following criteria:

(i) Each laboratory shall contain a facility for hand washing and an eye wash facility which is readily available within the work area.

(ii) An autoclave for decontamination of regulated waste shall be available.

(3) HIV and HBV production facilities shall meet the following criteria:

(i) The work areas shall be separated from areas that are open to unrestricted traffic flow within the building. Passage through two sets of doors shall be the basic requirement for entry into the work area from access corridors or other contiguous areas. Physical separation of the high-containment work area from access corridors or other areas or activities may also be provided by a double-doored clothes-change room (showers may be included), airlock, or other access facility that requires passing through two sets of doors before entering the work area.

(ii) The surfaces of doors, walls, floors and ceilings in the work area shall be water resistant so that they can be easily cleaned. Penetrations in these surfaces shall be sealed or capable of being sealed to facilitate decontamination.

(iii) Each work area shall contain a sink for washing hands and a readily available eye wash facility. The sink shall be foot, elbow, or automatically operated and shall be located near the exit door of the work area.

(iv) Access doors to the work area or containment module shall be self-closing.

(v) An autoclave for decontamination of regulated waste shall be available within or as near as possible to the work area.

(vi) A ducted exhaust-air ventilation system shall be provided. This system shall create directional airflow that draws air into the work area through the entry area. The exhaust air shall not be recirculated to any other area of the building, shall be discharged to the outside, and shall be dispersed away from occupied areas and air intakes. The proper direction of the airflow shall be verified (i.e., into the work area).

(5) *Training Requirements.* Additional training requirements for employees in HIV and HBV research laboratories and HIV and HBV production facilities are specified in paragraph (g)(2)(ix).

(f) *Hepatitis B vaccination and post-exposure evaluation and follow-up*—(1) *General.* (i) The employer shall make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation and follow-up to all employees who have had an exposure incident.

(ii) The employer shall ensure that all medical evaluations and procedures including the hepatitis B vaccine and vaccination series and post-exposure evaluation and follow-up, including prophylaxis, are:

(A) Made available at no cost to the employee;

(B) Made available to the employee at a reasonable time and place;

(C) Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed healthcare professional; and

(D) Provided according to recommendations of the U.S. Public Health Service current at the time these evaluations and procedures take place, except as specified by this paragraph (f).

(iii) The employer shall ensure that all laboratory tests are conducted by an accredited laboratory at no cost to the employee.

(2) *Hepatitis B Vaccination.* (i) Hepatitis B vaccination shall be made available after the employee has received the training required in paragraph (g)(2)(vii)(I) and within 10 working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete hepatitis B vaccination series, antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons.

(ii) The employer shall not make participation in a prescreening program a prerequisite for receiving hepatitis B vaccination.

(iii) If the employee initially declines hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the employer shall make available hepatitis B vaccination at that time.

(iv) The employer shall assure that employees who decline to accept hepatitis B vaccination offered by the employer sign the statement in appendix A.

(v) If a routine booster dose(s) of hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) shall be made available in accordance with section (f)(1)(ii).

(3) *Post-exposure Evaluation and Follow-up.* Following a report of an exposure incident, the employer shall make immediately available to the exposed employee a confidential medical evaluation and follow-up, including at least the following elements:

(i) Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred;

(ii) Identification and documentation of the source individual, unless the employer can establish that identification is infeasible or prohibited by state or local law;

(A) The source individual's blood shall be tested as soon as feasible and after consent is obtained in order to determine HBV and HIV infectivity. If consent is not obtained, the employer shall establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, shall be tested and the results documented.

(B) When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status need not be repeated.

(C) Results of the source individual's testing shall be made available to the exposed employee, and the employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

(iii) Collection and testing of blood for HBV and HIV serological status:

(A) The exposed employee's blood shall be collected as soon as feasible and tested after consent is obtained.

(B) If the employee consents to baseline blood collection, but does not give consent at that time for HIV serologic testing, the sample shall be preserved for at least 90 days. If, within 90 days of the exposure incident, the employee elects to have the baseline sample tested, such testing shall be done as soon as feasible.

(iv) Post-exposure prophylaxis, when medically indicated, as recommended by the U.S. Public Health Service;

(v) Counseling; and

(vi) Evaluation of reported illnesses.

(4) *Information Provided to the Healthcare Professional.* (i) The employer shall ensure that the healthcare professional responsible for the employee's Hepatitis B vaccination is provided a copy of this regulation.

(ii) The employer shall ensure that the healthcare professional evaluating an employee after an exposure incident is provided the following information:

(A) A copy of this regulation;

(B) A description of the exposed employee's duties as they relate to the exposure incident;

(C) Documentation of the route(s) of exposure and circumstances under which exposure occurred;

(D) Results of the source individual's blood testing, if available; and

(E) All medical records relevant to the appropriate treatment of the employee including vaccination status which are the employer's responsibility to maintain.

(5) *HealthCare Professional's Written Opinion.* The employer shall obtain and provide the employee with a copy of the evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.

(i) The healthcare professional's written opinion for Hepatitis B vaccination shall be limited to whether Hepatitis B vaccination is indicated for an employee, and if the employee has received such vaccination.

(ii) The healthcare professional's written opinion for post-exposure evaluation and follow-up shall be limited to the following information:

(A) That the employee has been informed of the results of the evaluation; and

(B) That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.

(iii) All other findings or diagnoses shall remain confidential and shall not be included in the written report.

(6) *Medical recordkeeping.* Medical records required by this standard shall be maintained in accordance with paragraph (h)(1) of this section.

(g) *Communication of hazards to employees*—(1) *Labels and signs.* (i) Labels. (A) Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing blood or other potentially infectious material; and other containers used to store, transport or ship blood or other potentially infectious materials, except as provided in paragraph (g)(1)(i)(E), (F) and (G).

(B) Labels required by this section shall include the following legend:

BIOHAZARD

(C) These labels shall be fluorescent orange or orange-red or predominantly so, with lettering and symbols in a contrasting color.

(D) Labels shall be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

(E) Red bags or red containers may be substituted for labels.

(F) Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical use are exempted from the labeling requirements of paragraph (g).

(G) Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment or disposal are exempted from the labeling requirement.

(H) Labels required for contaminated equipment shall be in accordance with this paragraph and shall also state which portions of the equipment remain contaminated.

(I) Regulated waste that has been decontaminated need not be labeled or color-coded.

(ii) Signs. (A) The employer shall post signs at the entrance to work areas specified in paragraph (e), HIV and HBV Research Laboratory and Production Facilities, which shall bear the following legend:

BIOHAZARD

(Name of the Infectious Agent)
(Special requirements for entering the area)
(Name, telephone number of the laboratory director or other responsible person.)

(B) These signs shall be fluorescent orange-red or predominantly so, with lettering and symbols in a contrasting color.

(2) *Information and Training.* (i) Employers shall ensure that all employees with occupational exposure participate in a training program which must be provided at no cost to the employee and during working hours.

(ii) Training shall be provided as follows:

(A) At the time of initial assignment to tasks where occupational exposure may take place;

(B) Within 90 days after the effective date of the standard; and

(C) At least annually thereafter.

(iii) For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard which were not included need be provided.

(iv) Annual training for all employees shall be provided within one year of their previous training.

(v) Employers shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

(vi) Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.

(vii) The training program shall contain at a minimum the following elements:

(A) An accessible copy of the regulatory text of this standard and an explanation of its contents;

(B) A general explanation of the epidemiology and symptoms of bloodborne diseases;

(C) An explanation of the modes of transmission of bloodborne pathogens;

(D) An explanation of the employer's exposure control plan and the means by which the employee can obtain a copy of the written plan;

(E) An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;

(F) An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment;

(G) Information on the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment;

(H) An explanation of the basis for selection of personal protective equipment;

(I) Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;

(J) Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;

(K) An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;

(L) Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;

(M) An explanation of the signs and labels and/or color coding required by paragraph (g)(1); and

(N) An opportunity for interactive questions and answers with the person conducting the training session.

(viii) The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.

(ix) Additional Initial Training for Employees in HIV and HBV Laboratories and Production Facilities. Employees in HIV or HBV research laboratories and HIV or HBV production facilities shall receive the following initial training in addition to the above training requirements.

(A) The employer shall assure that employees demonstrate proficiency in standard microbiological practices and techniques and in the practices and operations specific to the facility before being allowed to work with HIV or HBV.

(B) The employer shall assure that employees have prior experience in the handling of human pathogens or tissue cultures before working with HIV or HBV.

(C) The employer shall provide a training program to employees who have no prior experience in handling human pathogens. Initial work activi-

ties shall not include the handling of infectious agents. A progression of work activities shall be assigned as techniques are learned and proficiency is developed. The employer shall assure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

(h) *Recordkeeping*—(1) *Medical Records.* (i) The employer shall establish and maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.20.

(ii) This record shall include:

(A) The name and social security number of the employee;

(B) A copy of the employee's hepatitis B vaccination status including the dates of all the hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination as required by paragraph (f)(2);

(C) A copy of all results of examinations, medical testing, and follow-up procedures as required by paragraph (f)(3);

(D) The employer's copy of the healthcare professional's written opinion as required by paragraph (f)(5); and

(E) A copy of the information provided to the healthcare professional as required by paragraphs (f)(4)(ii)(B)(C) and (D).

(iii) Confidentiality. The employer shall ensure that employee medical records required by paragraph (h)(1) are:

(A) Kept confidential; and

(B) Not disclosed or reported without the employee's express written consent to any person within or outside the workplace except as required by this section or as may be required by law.

(iv) The employer shall maintain the records required by paragraph (h) for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.20.

(2) *Training Records.* (i) Training records shall include the following information:

(A) The dates of the training sessions;

(B) The contents or a summary of the training sessions;

(C) The names and qualifications of persons conducting the training; and

(D) The names and job titles of all persons attending the training sessions.

(ii) Training records shall be maintained for 3 years from the date on which the training occurred.

(3) *Availability.* (i) The employer shall ensure that all records required to be maintained by this section shall be made available upon request to the Assistant Secretary and the Director for examination and copying.

(ii) Employee training records required by this paragraph shall be provided upon request for examination and copying to employees, to employee representatives, to the Director, and to the Assistant Secretary.

(iii) Employee medical records required by this paragraph shall be provided upon request for examination and copying to the subject employee, to anyone having written consent of the subject employee, to the Director, and to the Assistant Secretary in accordance with 29 CFR 1910.20.

(4) *Transfer of Records.* (i) The employer shall comply with the requirements involving transfer of records set forth in 29 CFR 1910.20(h).

(ii) If the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the Director, at least three months prior to their disposal and transmit them to the Director, if required by the Director to do so, within that three month period.

(i) *Dates*—(1) *Effective Date.* The standard shall become effective on March 6, 1992.

(2) The Exposure Control Plan required by paragraph (c) of this section shall be completed on or before May 5, 1992.

(3) Paragraph (g)(2) Information and Training and (h) Recordkeeping shall take effect on or before June 4, 1992.

(4) Paragraphs (d)(2) Engineering and Work Practice Controls, (d)(3) Personal Protective Equipment, (d)(4) Housekeeping, (e) HIV and HBV Research Laboratories and Production Facilities, (f) Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up, and (g) (1) Labels and Signs, shall take effect July 6, 1992.

APPENDIX A TO SECTION 1910.1030—HEPATITIS B VACCINE DECLINATION (MANDATORY)

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

(Approved by the Office of Management and Budget under control number 1218-0180)

[56 FR 64175, Dec. 6, 1991, as amended at 57 FR 12717, Apr. 13, 1992; 57 FR 29206, July 1, 1992]

§ 1910.1043 Cotton dust.

(a) *Scope and application.* (1) This section, in its entirety, applies to the control of employee exposure to cotton dust in all workplaces where employees engage in yarn manufacturing, engage in slashing and weaving operations, or work in waste houses for textile operations.

(2) This section does not apply to the handling or processing of woven or knitted materials; to maritime operations covered by 29 CFR Parts 1915 and 1918; to harvesting or ginning of cotton; or to the construction industry.

(3) Only paragraphs (h) Medical surveillance, (h)(2) through (4) Recordkeeping—Medical Records, and Appendices B, C and D of this section apply in all work places where employees exposed to cotton dust engage in cottonseed processing or waste processing operations.

(4) This section applies to yarn manufacturing and slashing and weaving operations exclusively using washed cotton (as defined by paragraph (n) of this section) only to the extent specified by paragraph (n) of this section.

(5) This section, in its entirety, applies to the control of all employees exposure to the cotton dust generated in the preparation of washed cotton from opening until the cotton is thoroughly wetted.

(6) This section does not apply to knitting, classing or warehousing operations except that employers with these operations, if requested by NIOSH, shall grant NIOSH access to their employees and workplaces for exposure monitoring and medical examinations for purposes of a health study to be performed by NIOSH on a sampling basis.

(b) *Definitions.* For the purpose of this section:

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee;

Blow down means the general cleaning of a room or a part of a room by the use of compressed air.

Blow off means the use of compressed air for cleaning of short duration and usually for a specific machine or any portion of a machine.

Cotton dust means dust present in the air during the handling or processing of cotton, which may contain a mixture of many substances including ground up plant matter, fiber, bacteria, fungi, soil, pesticides, non-cotton plant matter and other contaminants which may have accumulated with the cotton during the growing, harvesting and subsequent processing or storage periods. Any dust present during the handling and processing of cotton through the weaving or knitting of fabrics, and dust present in other operations or manufacturing processes using raw or waste cotton fibers or cotton fiber byproducts from textile mills are considered cotton dust within this definition. Lubricating oil mist associated with weaving operations is not considered cotton dust.

Director means the Director of the National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, or designee.

Equivalent Instrument means a cotton dust sampling device that meets the vertical elutriator equivalency requirements as described in paragraph (d)(1)(iii) of this section.

Lint-free respirable cotton dust means particles of cotton dust of approximately 15 micrometers or less aerodynamic equivalent diameter;

Appendix B

International Chiefs of Police Model Policy

Model Policy

Effective Date	Number
December 1, 1989	

Subject
Communicable Disease

Reference	Special Instructions

Distribution	Reevaluation Date	No. Pages
	November 30, 1990	

I. PURPOSE

The purpose of this policy is to provide guidelines for law enforcement officers in preventing the contraction of communicable diseases.

II. POLICY

It is the responsibility of the department to ensure that its members are able to perform their duties in a safe and effective manner. The safe performance of daily operations has recently become threatened by life-endangering communicable diseases. Therefore, it shall be the policy of this department to continuously provide employees with up-to-date safety procedures and communicable disease information that will assist in minimizing potential exposure, while increasing their understanding of the nature and potential risks of communicable diseases.

III. DEFINITIONS

A. Body Fluids: Liquid secretions including blood, semen and vaginal or other secretions that might contain these fluids such as saliva, vomit, urine or feces.

B. Communicable Disease: Those infectious illnesses that are transmitted through contact with the body fluids of an infected individual.

IV. PROCEDURES

A. Communicable Disease Prevention

1. In order to minimize potential exposure to communicable diseases, officers should assume that all persons are potential carriers of a communicable disease.
2. Disposable gloves shall be worn when handling any persons, clothing or equipment with body fluids on them.
3. Masks, protective eyewear and coveralls shall be worn where body fluids may be splashed on the officer.
4. Plastic mouthpieces or other authorized barrier/resuscitation devices shall be used whenever an officer performs CPR or mouth-to-mouth resuscitation.
5. All sharp instruments such as knives, scalpels and needles shall be handled with extraordinary care, and should be considered contaminated items.
   a. Leather gloves shall be worn when searching for or handling sharp instruments.
   b. Officers shall not place their hands in areas where sharp instruments might be hidden. An initial visual search of the area should be conducted, using a flashlight where necessary. The suspect may also be asked to remove such objects from his person.
   c. Needles shall not be recapped, bent, broken, removed from a disposable syringe or otherwise manipulated by hand.
   d. Needles shall be placed in a puncture-resistant container when being collected for evidentiary or disposal purposes.
6. Officers shall not smoke, eat, drink or apply makeup around body fluid spills.
7. Any evidence contaminated with body fluids will be dried, double bagged in plastic bags and marked to identify potential or known communicable disease contamination.

B. Transport and Custody

1. Where appropriate protective equipment is available, no officer shall refuse to arrest or otherwise physically handle any person who may have a communicable disease.
2. Officers shall not put their fingers in or near any person's mouth.
3. Individuals with body fluids on t. *air* persons shall be transported in separate vehicles from other individuals. The individual may be required to wear a suitable protective covering if he is bleeding or otherwise emitting body fluids.
4. Officers have an obligation to notify relevant support personnel during a transfer of custody when the suspect has body fluids present on his person, or has stated that he has a communicable disease.
5. Suspects taken into custody with body fluids on their persons shall be directly placed in the designated holding area for processing. The holding area shall be posted with an "Isolated Area—Do Not Enter" sign.
6. Officers shall document on the appropriate arrest or incident form when a suspect taken into custody has body fluids on his person, or has stated that he has a communicable disease.

C. Disinfection

1. Any unprotected skin surfaces that come into contact with body fluids shall be immediately and thoroughly washed with hot running water and soap for 15 seconds before rinsing and drying.
   a. Alcohol or antiseptic towelettes may be used where soap and water are unavailable.
   b. Disposable gloves should be rinsed before removal. The hands and forearms should then be washed.

c. Hand lotion should be applied after disinfection to prevent chapping and to seal cracks and cuts on the skin.
d. All open cuts and abrasions shall be covered with waterproof bandages before reporting for duty.

2. Officers should remove clothing that has been contaminated with body fluids as soon as practical. Any contacted skin area should then be cleansed in the prescribed fashion. Contaminated clothing should be handled carefully and laundered in the normal fashion.
3. Disinfection procedures shall be initiated whenever body fluids are spilled, or an individual with body fluids on his person is transported in a departmental vehicle.
   a. A supervisor shall be notified and the vehicle taken to the service center as soon as possible.
   b. Affected vehicles shall be immediately designated by the posting of an "Infectious Disease Contamination" sign upon arrival at the service center and while awaiting disinfection.
   c. Service personnel shall remove any excess body fluids from the vehicle with an absorbent cloth, paying special attention to any cracks, crevices or seams that may be holding excess fluid.
   d. The affected area should be disinfected using hot water and detergent or alcohol, and allowed to air dry.
   e. All police vehicles taken to a service center for scheduled washing and lubrication will routinely be cleaned in the interior with an approved disinfectant.
4. Nondisposable equipment and areas upon which body fluids have been spilled shall be disinfected as follows:
   a. Any excess of body fluids should first be wiped up with approved disposable absorbent materials.
   b. A freshly prepared solution of one part bleach to 10 parts water or a fungicidal/mycobactericidal disinfectant shall be used to clean the area or equipment.
5. All disposable equipment, cleaning materials or evidence contaminated with body fluids shall be bagged and disposed of in compliance with state law provisions for disposal of biologically hazardous waste material.

D. Supplies
1. Supervisors are responsible for continuously maintaining and storing in a convenient location an adequate amount of communicable disease control supplies for their unit.
2. Supervisors are responsible for dissemination of supplies for infectious disease control. Protective gloves, other first aid supplies and disinfecting materials will be made readily available at all times.
3. All departmental vehicles shall be continuously stocked with the following communicable disease control supplies:
   a. Clean coveralls in appropriate sizes
   b. Disposable gloves and leather gloves
   c. Puncture-resistant containers and sealable plastic bags
   d. Barrier resuscitation equipment, goggles and masks
   e. Liquid germicidal cleaner
   f. Disposable towelettes (70 percent isopropyl alcohol)
   g. Waterproof bandages
   h. Absorbent cleaning materials
   i. "Isolation Area—Do Not Enter" signs
4. Officers using supplies stored in police vehicles are responsible for their immediate replacement.
5. Officers are required to keep disposable gloves in their possession while on either motor or foot patrol.

E. Line of Duty Exposures to Communicable Diseases
1. Any officer who has been bitten by a person, or who has had physical contact with body fluids of another person while in the line of duty shall be considered to have been exposed to a communicable disease.
2. A supervisor shall be contacted, and all appropriate duty injury and medical forms shall be completed by the supervisor.
3. Immediately after exposure, the officer shall be transported to the appropriate health care facility for clinical and serological testing for evidence of infection.
   a. The department shall ensure continued testing of the officer for evidence of infection and provide psychological counseling as determined necessary by the health care official.
   b. Unless disclosure to an appropriate departmental official is authorized by the officer or by state law, the officer's test results shall remain confidential.
4. Any person responsible for potentially exposing the officer to a communicable disease shall be encouraged to undergo testing to determine if the person has a communicable disease.
   a. The person shall be provided a copy of the test results and guaranteed its confidentiality.
   b. Criminal charges may be sought against any person who intentionally acts to expose an officer to a communicable disease.
5. Officers who test positive for a communicable disease may continue working as long as they maintain acceptable performance and do not pose a safety and health threat to themselves, the public or members of the department.
   a. The department shall make all decisions concerning the employee's work status solely on the medical opinions and advice of the department's health care officials.
   b. The department may require an employee to be examined by department health care officials to determine if he is able to perform his duties without hazard to himself or others.
6. All personnel shall treat employees who have contracted a communicable disease fairly, courteously and with dignity.

F. Record Keeping

The department shall maintain written records of all incidents involving employees who have potentially been exposed to a communicable disease while acting in the line of duty. The records shall be stored in a secured area with limited access, and maintained in conformance with applicable privacy laws.

BY ORDER OF

_____

CHIEF OF POLICE

Appendix C

Panel of Experts Letter of Participation

KEN PEARSON
8900 Colchester Ridge Road
Knoxville, TN 37922

Dear Panel Member,

First I want to thank you for agreeing to review my questionnaire as your expertise will be valuable to my research efforts. I am enclosing Chapter 1 and a copy of the questionnaire for your review. As I mentioned in our phone conversation I am hoping to analyze the variables formal education, experience and amount of training received while they have been in law enforcement concerning AIDS, HIV, or Hepatitis B (HBV). I would like to be able to gather this descriptive data and compare it to four common situations police officers may face while on the job. I am hoping to gain a better understanding of police officers levels of perceived risks to possible occupational exposure to HIV and HBV. I am planning on using Chi-Square and frequency distributions to address the research questions. Please feel free to make suggestions/recommendations.

Thank you once again.

Sincerely,

Ken Pearson

Appendix D

Initial Survey Instrument

SURVEY

This part of the survey deals with demographic data, educational attainment experience and training that you have had concerning Human Immunodeficiency Hepatitis B Virus.

Please check the appropriate space or fill in the appropriate space to the best of your knowledge.

1. What is your age?_____

2. What is your current education level?

_____ High School Degree or G.E.D.

_____ Some College

_____ Associate Degree

_____ Bachelor's Degree

_____ Some Graduate Work

_____ Master's Degree or higher

3. How many years have you been employed with your department, this includes volunteer work. years _____ months _____

4. How many years have you been employed in law enforcement altogether? _____ years _____ months

5. What is your current position?

_____ Patrol Officer

_____ Jail Officer

_____ Investigator

_____ Line Supervisor

_____ Administrator

_____ Other (specify)

6. How often would you say you receive training concerning AIDS and/or Hepatitis B?

_____ Only once

_____ Monthly

_____ Every three months

_____ Every six months

_____ Yearly

_____ Never received

7. When was the last time you attended a training session that included information on HIV/HBV?

_____ Within last month

_____ Within last three months

_____ Within last six months

_____ Within last nine months

_____ Over a year

8. How many times have you received this training since you have been in law enforcement?

_____

9. How long does this training session usually last?

_____ 30 minutes or less

_____ 1 hour

_____ 1 1/2 hours

_____ 2 hours

_____ More than 2 hours

_____ Does not apply

10. How frequent would you say you are occupationally exposed to HIV or HBV during an average work week?

_____ 0 Times

_____ 1-3 Times

_____ 4-6 Times

_____ 6 or more

11. When you feel you have been occupationally exposed to HIV or HBV how long do you feel such risks to the exposure usually last on an average?

_____ Less than 1 minute

_____ 1 to 2 Minutes

_____ 3 to 5 Minutes

_____ Over 5 Minutes

_____ Do not know

12. Have you received any of the inoculations for the Hepatitis B vaccination? _____ Yes, _____ No

_____ Do not know. (If you have received at least one shot answer yes.) Please record the actual number of shots you have received.

_____ One

_____ Two

_____ Three

13. Do you feel that Occupational Exposure to HIV is a threat to you?

_____ Strongly agree

_____ Agree

_____ Not sure

_____ Disagree

_____ Strongly disagree

14. Do you feel that Occupational Exposure to HBV is a threat to you?

_____ Strongly agree

_____ Agree

_____ Not sure

_____ Disagree

_____ Strongly disagree

The next part of the survey asks you to respond to the degree of perceived risk you would feel in the scenarios provided?

Drug Bust

When the call comes in: Several merchants have complained about the sale and use of IV drugs in their parking lots. As a result, you are one of the two undercover officers who have been staking out the area for several weeks.

When you arrive on the scene: You observe two people who show suspicious behavior in a parked car. You and your partner approach the car from behind the scene and observe they have narcotics paraphernalia and are preparing to shoot up. You arrest the suspects, and then search and handcuff them. Next, you conduct a thorough search of the vehicle, handling and bagging the above noted paraphernalia.

Please respond to what you believe is the amount of perceived risk of exposure to the diseases below. Please answer honestly: Make full statements: "Your percieved risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. Extremely high risk	A. Extremely high risk
B. High risk	B. High risk
C. Moderate risk	C. Moderate risk
D. Low risk	D. Low risk
E. No risk	E. No risk

BARROOM FIGHT

When the call comes in: At 10:00 p.m., your car is dispatched to a report of a fight in a local bar.

When you arrive on the scene: Two men are in a violent fight; one has a knife. Both are injured and bleeding from multiple wounds at the mouth, nose, arms, and hands. As you approach the men, you order them to break up the fight. They ignore you. Your partner draws his nightstick and tries to break up the fight. As he approaches the men, he slips and falls down. You subdue the other man and handcuff him. Next, you pull the man with the knife off your partner and hold him to the ground, while your partner calls for backup. You gain control of the bloody knife and process it as evidence.

Please respond to what you believe the amount of perceived risk of exposure to the disease below. Please answer honestly: Make full statements: "Your perceived risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. Extremely high risk	A. Extremely high risk
B. High risk	B. High risk
C. Moderate risk	C. Moderate risk
D. Low risk	D. Low risk
E. No risk	E. No risk

VIOLENT MALE OUTSIDE HOUSE

When the call comes in: At 2:00 p.m. you have been dispatched to a report of an extremely violent, distraught person who is yelling and screaming in a front yard.

When you arrive on the scene: You find a 39-year-old male outside a house screaming "Take me to the hospital! I am dying! I am dying!" A witness who identifies herself as a close relative tells you that he is suffering the later stages of AIDS and lost control of his mental reasoning. When you approach him, he becomes violent and assaults you inflicting several superficial wounds to your body. To avoid more serious harm you are forced to physically subdue him.

Please respond to what you believe of perceived risk of exposure to the disease below. Please answer honestly. Make full statements: "Your perceived risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. Extremely high risk	A. Extremely high risk
B. High risk	B. High risk
C. Moderate risk	C. Moderate risk
D. Low risk	D. Low risk
E. No risk	E. No risk

STABBING

When the call comes in: At 2:00 a.m. you are dispatched to a reported stabbing of a woman in a hotel that is known to be frequented by prostitutes.

When you arrive on the scene: You find a woman in bed bleeding from two stab wounds in the chest area. She is unconscious and has labored breathing. Red frothy blood seeps from her mouth. Drug paraphernalia is on the bedside table. The woman appears to stop breathing and you must perform artificial respiration to keep her alive. Assume you have all the protective equipment you would normally have.

Please respond to what you believe is the amount of perceived risk of exposure to the disease below. Please answer honestly: Make full statements: "Your perceived risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. Extremely high risk	A. Extremely high risk
B. High risk	B. High risk
C. Moderate risk	C. Moderate risk
D. Low risk	D. Low risk
E. No risk	E. No risk

Appendix E

Final Survey Instrument

QUESTIONNAIRE

Part I

This part of the questionnaire deals with formal educational attainment, experience and training that you have received concerning Human Immunodeficiency (HIV) and Hepatitis B Virus (HBV).

Please check the appropriate space or fill in the appropriate space to the best of your knowledge.

1. What is your age?_____

2. What is your gender? Male _____ Female ____

3. What is your current Education Level? (Check all that apply)

   _____ High School Degree or G.E.D.

   _____ Some College

   _____ Associate Degree

   _____ Bachelor's Degree

   _____ Some Graduate Work

   _____ Master's Degree or higher

4. How many years have you been employed in law enforcement?

   Years _____ Months _____

5. What is your current position?

   _____ Patrol Officer

   _____ Dispatcher

_____ Jail Officer

_____ Investigator

_____ Line Supervisor

_____ Administrator

_____ Other (specify)

6. Did you attend the academy ? Yes _____ No ____

7. How long have you been out? Years _____ Months _____

8. How often have you attended a training concerning HIV and/or Hepatitis B?

_____ Never received

_____ Only once

_____ Monthly

_____ Semi-annually

_____ Annually

9. When was the last time you attended a training session that included information on HIV/HBV?

Date: Month _____ Year _____

_____ January - March

_____ April - June

_____ July - September

_____ October - December

10. How many different series of training have you received concerning HIV and HBV since you have been in law enforcement?

_____

11. How frequently are law enforcement officers (LEO's) occupationally exposed to HIV or HBV during an average work week?

_____ 0 Times

_____ 1 - 3 Times

_____ 4-6 Times

_____ 6 or More

12. When you feel you have been occupationally exposed to HIV or HBV, how long do you believe such risks to the exposure would usually last?

_____ Less than 1 Minute

_____ 1 to 2 Minutes

_____ 3 to 5 Minutes

_____ Over 5 Minutes

_____ Do not know

13. Have you ever received any of the inoculations for the Hepatitis B vaccination?

Yes _____ No _____

(If you have received at least one shot answer yes.)

Please record the actual number of shots you have received.

_____ One _____ Two _____ Three

Part II

The next part of the questionnaire asks you to respond to the degree of perceived risk you would feel in the scenarios provided. Please answer the questions honestly.

Drug Bust

When the call comes in: Several merchants have complained about the sale and use of IV drugs in their parking lots. As a result, you are one of the two undercover officers who have been staking out the area for several weeks.

When you arrive on the scene: You observe two people who show suspicious behavior in a parked car. You and your partner approach the car from behind the scene and observe they have narcotics paraphernalia and are preparing to shoot up. You arrest the suspects, and then search and handcuff them. Next, you conduct a thorough search of the vehicle, handling and bagging the above noted paraphernalia.

Please respond to what you believe is the amount of perceived risk of exposure to the diseases below. Please answer honestly: Make full statements: "Your perceived risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. High risk	A. High risk
B. Moderate risk	B. Moderate risk
C. Low risk	C. Low risk

BARROOM FIGHT

When the call comes in: At 10:00 p.m., your car is dispatched to a report of a fight in a local bar.

When you arrive on the scene: Two men are in a violent fight; one has a knife. Both are injured and bleeding from multiple wounds at the mouth, nose, arms, and hands. As you approach the men, you order them to break up the fight. They ignore you. Your partner draws his nightstick and tries to break up the fight. As he approaches the men, he slips and falls down. You subdue the other man and handcuff him. Next, you pull the man with the knife off your partner and hold him to the ground, while your partner calls for backup. You gain control of the bloody knife and process it as evidence.

Please respond to what you believe the amount of perceived risk of exposure to the disease below. Please answer honestly: Make full statements: "Your perceived risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. High risk	A. High risk
B. Moderate risk	B. Moderate risk
C. Low risk	C. Low risk

VIOLENT MALE OUTSIDE HOUSE

When the call comes in: At 2:00 p.m. you have been dispatched to a report of an extremely violent, distraught person who is yelling and screaming in a front yard.

When you arrive on the scene: You find a 39-year-old male outside a house screaming "Take me to the hospital! I am dying! I am dying!" A witness who identifies herself as a close relative tells you that he is suffering the later stages of AIDS and lost control of his mental reasoning. When you approach him, he becomes violent and assaults you inflicting several superficial wounds to your body. To avoid more serious harm you are forced to physically subdue him.

Please respond to what you believe of perceived risk of exposure to the disease below. Please answer honestly. Make full statements: "Your perceived risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. High risk	A. High risk
B. Moderate risk	B. Moderate risk
C. Low risk	C. Low risk

STABBING

When the call comes in: At 2:00 a.m. you are dispatched to a reported stabbing of a woman in a hotel that is known to be frequented by prostitutes.

When you arrive on the scene: You find a woman in bed bleeding from two stab wounds in the chest area. She is unconscious and has labored breathing. Red frothy blood seeps from her mouth. Drug paraphernalia is on the bedside table. The woman appears to stop breathing and you must perform artificial respiration to keep her alive. Assume you have all the protective equipment you would normally have.

Please respond to what you believe is the amount of perceived risk of exposure to the disease below. Please answer honestly: Make full statements: "Your perceived risk of exposure to HIV/HBV after arriving is best described as follows:"

HIV	HBV
A. High risk	A. High risk
B. Moderate risk	B. Moderate risk
C. Low risk	C. Low risk

Appendix F

Descriptive data

Descriptive Data

2. What is your gender?

Sex	Number	%
Male	99	95%
Female	6	5%
Total	105	100%

3. What is your current education Level? (Check all that apply)

Education	Number	%
High School or GED	21	20%
Some College	49	47%
Associate Degree	20	19%
Bachelor's Degree	13	12%
Some Graduate Work	2	2%
Total	105	100%

5. What is your current position?

Position	Number	%
Patrol Officer	97	92%
Dispatcher	0	0%
Jail Officer	0	0%
Investigator	1	1%
Line Supervisor	5	5%
Administrator	0	0%
Wagon Driver	1	1%
Unknown	1	1%
Total	105	100%

8. How often have you attended training concerning HIV or HBV?

Answer	Number	%
Never received	0	0
Only once	36	35%
Monthly	0	0
Semi-annually	12	11%
Annually	57	54%
Total	105	100%

8. How often have you attended training concerning HIV and/or HBV?

Year attended	Number	%
1995	52	50
1994	47	45
1993	3	2.5
1992	3	2.5
Total	105	100

10. How many different series of training have you received concerning HIV and HBV since you have been in law enforcement?

Training received	Number	%
One	32	30.5%
Two	32	30.5%
Three	13	12.5%
Four	13	12.5%
Five	4	3%
Six or more	11	10%
Total	105	100%

11. How frequently would you say you are occupationally exposed to HIV or HBV during an average work week?.

Frequency	Number	%
1-3 times a week	65	62
4-6 times a week	22	21
6 times a week	18	17
Total	105	100

12. Have you ever received any of the inoculations for the Hepatitis B Vaccination? (If you received at least one shot answer yes.) Please record the actual number of shots you have received

Response	Number	%
Yes	91	87
No	14	13
Total	105	100

Shots received	Number	%
	14	0
1	4	4
2	22	21
3	65	62
Total	105	100

Appendix F

Dissertation Matrix

DISSERTATION MATRIX

Research Questions	Data Used for Analysis From Questionnaire and Scenarios	Data Analysis and Statistical Procedures
1. Does the amount of formal education that Knox County Law Enforcement Officers have influence their level of perceived risk to occupational exposure to HIV using case scenarios?	3. A. What is your current educational level? (Check all that apply) ____ High School or GED ____ Some College ____ Associate Degree ____ Bachelor's Degree ____ Some Graduate Work ____ Master's Degree or Higher B. Police Officer's responses to the 4 case scenarios - The responses to choose from: a. Extremely high risk b. High risk c. Moderate risk d. Low risk e. No risk	1. Chi-square with a .05 level of significance. 2. Cross Tabulations. 3. Measures of central tendencies. 4. Charts and graphs.

2. Does the amount of formal education that Knox County Law Enforcement Officers have influence their level of perceived risk to occupational exposure to HBV using case scenarios?	3. A. What is your current educational level? (Check all that apply) ____ High School or GED ____ Some College ____ Associate Degree ____ Bachelor's Degree ____ Some Graduate Work ____ Master's Degree or Higher B. Police Officer's responses to the 4 case scenarios - The responses to choose from: a. Extremely high risk b. High risk c. Moderate risk d. Low risk e. No risk	1. Chi-square with a .05 level of significance. 2. Cross Tabulations. 3. Measures of central tendencies. 4. Charts and graphs.
3. Does the length of service that Knox County Law Enforcement Officers have influence their level of perceived risk to occupational exposure to HIV using case scenarios?	4. A. How many years of you been employed in law enforcement? Years _____ Months _____ B. Police Officer's responses to the 4 case scenarios - The responses to choose from: a. Extremely high risk b. High risk c. Moderate risk d. Low risk e. No risk	1. Chi-square with a .05 level of significance. 2. Cross Tabulations. 3. Measures of central tendencies. 4. Charts and graphs.

4. Does the length of service that Knox County Law Enforcement Officers have influence their level of perceived risk to occupational exposure to HBV using case scenarios?	A. How many years of you been employed in law enforcement? Years _____ Months _____ B. Police Officer's responses to the 4 case scenarios - The responses to choose from: a. Extremely high risk b. High risk c. Moderate risk d. Low risk e. No risk	1. Chi-square with a .05 level of significance. 2. Cross Tabulations. 3. Measures of central tendencies. 4. Charts and graphs.
5. Does the amount of training received concerning HIV Knox County Law Enforcement Officers have influence their level of perceived risk to occupational exposure to HIV using case scenarios?	9. A. How many different of series of training have you received concerning HIV and HBV since you have been involved in law enforcement? _____ B. Police Officer's responses to the 4 case scenarios - The responses to choose from: a. Extremely high risk b. High risk c. Moderate risk d. Low risk e. No risk	1. Chi-square with a .05 level of significance. 2. Cross Tabulations. 3. Measures of central tendencies. 4. Charts and graphs.

6. Does the amount of training received concerning HBV Knox County Law Enforcement Officers have influence their level of perceived risk to occupational exposure to HBV using case scenarios?	A. How many different of series of training have you received concerning HIV and HBV since you have been involved in law enforcement? _____ B. Police Officer's responses to the 4 case scenarios - The responses to choose from: a. Extremely high risk b. High risk c. Moderate risk d. Low risk e. No risk	1. Chi-square with a .05 level of significance. 2. Cross Tabulations. 3. Measures of central tendencies. 4. Charts and graphs.
7. Do Knox County Law Enforcement Officers who have been immunized to HBV have a significant difference in the level of perceived risk to occupational exposure using case scenarios?	12. A. Have you ever received any the inoculations for the Hepatitis B disease? Yes ____ No ____ B. Police Officer's responses to the 4 case scenarios - The responses to choose from: a. Extremely high risk b. High risk c. Moderate risk d. Low risk e. No risk	1. Chi-square with a .05 level of significance. 2. Cross Tabulations. 3. Measures of central tendencies. 4. Charts and graphs.

Vita

Ken Pearson was born in Memphis, Tennessee and has lived in East Tennessee for 38 years. After graduating from Dobyns-Bennett High School in Kingsport Tennessee, he attended East Tennessee State University where he received a Bachelor of Science and a Master of Arts in Criminology. He worked for Youth Services International as a group Leader and health educator for male juvenile sex offenders for 4 years. He worked as a Health Education Specialist for the East Tennessee Area Health Education Center for about 8 months. He currently works with the Knox County Health Department in the Community Assessment and Planning Division as a Health Planner.