NAVAL HEALTH RESEARCH CENTER

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SUMMARY

Problem

While HIV infection is not common among U.S. military personnel, it is a disease of great personal and societal consequence. Since June 1981, 793,026 people in the United States have been diagnosed with AIDS. Military service members who become infected with HIV require specialized diagnostic and treatment services, and, under agreement with foreign governments, cannot be deployed. U.S. military personnel face HIV infection risks both within the United States and while assigned overseas. To curb new HIV infections among U.S. military personnel, it is of paramount importance to understand and quantify the multi-faceted risk factors for HIV infection in this population.

Objective

The objective of this study was to determine epidemiologic, behavioral, and clinical risk factors for HIV infection by military service.

Approach

Periodic testing of military personnel has led to a uniquely well-characterized cohort of HIV-seropositive persons. Because of mandatory HIV testing and the maintenance of testing records, the period of time between the last negative HIV test and the first positive test, known as the seroconversion window, can be estimated. HIV study participants can be surveyed for their geographic locations, risk factor characteristics, and behaviors during that defined time frame, yielding more accurate assessments than a study population where there may not be a last known or a relatively recent negative HIV test date.

Participation in this study was offered to HIV-seropositive military service members at 7 participating military HIV referral centers from 1997 through 2001. Epidemiologic, behavioral, and clinical risk factors for HIV infection during the seroconversion window were assessed through self-administered survey and then compared across services. These findings were part of a larger study that also included a medical chart review and blood sample collection for HIV viral load, CD4+ count, molecular subtype, and anti-retroviral drug resistance assays.

Results

Epidemiologic, behavioral, and clinical risk factor data were collected from 588 HIV-seropositive military personnel across 4 services (318 Navy, 73 Marine, 112 Army, and 85 Air Force). The study participants were predominantly single males with ranks of E4-E6. Although the majority of documented testing was done at military facilities, 33% of Air Force personnel reported having had an HIV test at a civilian site. The percentage of nonmilitary testing among the other services was about 15%. Many of the participants sought medical care for ARS-like (acute retroviral syndrome) symptoms. By service, 58-69% reported having symptoms consistent with ARS, and 75% of those sought medical care. The median number of sexual partners during the seroconversion window was approximately 5. As many as 88% of the participants reported

never/sometimes using condoms for vaginal or anal intercourse. During the seroconversion window, across the services, a majority had sex on the first date, 7-20% reported having had sex with a commercial sex worker, and 21-31% reported having had sex with someone they thought was infected with HIV. In addition, 19-26% of the participants reported having had a sexually transmitted disease (STD) during the seroconversion window. Most of the participants reported moderate/heavy or heavy alcohol use. A majority of the study participants reported sexual contacts solely in the United States, while 18-31% of the participants reported sexual contacts both in the United States and in foreign countries.

Conclusions

This cross-service epidemiologic and behavioral risk factor study of recent HIV seroconverters is the most comprehensive research of its kind to date. It provides essential information toward a greater understanding of HIV infection in the U.S. military by elucidating the key risk behaviors and demographics of this population. It illuminates both important military service-specific HIV risk factors and potential targets for intervention.

Participants in this study reported sexual behaviors that are consistent with other HIV risk factor studies, including poor partner selection and minimal to nonexistent condom use. These data highlight a very real need for safer sex messages to be implemented both stateside and abroad.

The high rate of STDs seen in this study population, nearly twice the rate seen in the 1998 DoD Survey of Health-Related Behaviors Among Military Personnel, leads us to believe that clinician referral of STD patients to an intensive HIV education program could potentially limit HIV acquisition in the military. Study results also document the high rates of alcohol abuse in this population. Since alcohol abuse is associated with STD/HIV acquisition, an efficient and effective use of resources would be to combine training for these two areas of risk behavior.

Another area of great interest and potential success is in the diagnosis and treatment of ARS. Future physician training should be directed at not only increasing ARS awareness, but at teaching skills to overcome potential reticence about discussing HIV risk behaviors with patients.

The data from this study highlight both the similarities and the differences in demographics and risk behavior between the services. It is unclear whether those differences reflect distinct risks within these populations or if they are due to the intrinsically unique composition and culture of the individual military service branches themselves. Additional studies investigating the relationship between these military-specific intricacies and HIV risk are necessary for future success in combating the spread of HIV in the military. Case-control studies comparing the HIV-seropositive Navy personnel with a healthy Navy control group are currently under way.

Background

Worldwide, HIV poses one of the most serious infectious disease threats of the twentieth and twenty-first centuries. As of December 2001, an estimated 40 million people were living with HIV/AIDS, and since the beginning of the epidemic more than 20 million people have died. In the year 2001 alone, approximately 5 million people were newly infected with HIV.[1]

In the United States, as of June 2001, a total of 339,000 people were reported to be living with AIDS. Additionally, 457,667 AIDS-related deaths occurred between 1981 and June 2001.[2] Although AIDS mortality and incidence rates in the United States have slowed, the incidence of new HIV infections remains stable with approximately 40,000 new cases annually. [3] When the U.S. epidemic began, anal sex practices and injection drug use (IDU) accounted for most HIV transmission. However, as the epidemic has matured, increased heterosexual transmission has resulted in adolescents, women, and ethnic minorities rising in importance as new risk groups.

A unique aspect of military service is deployment to foreign lands where interaction with local residents may present additional HIV risk. Therefore, global HIV prevalence rates are an important concern of the military. Worldwide, the HIV/AIDS epidemic is much worse than in the United States. For example, 7 countries in Sub-Saharan Africa have HIV/AIDS prevalence rates of 20% or higher among adults.[1] Because high HIV viral load and comorbid sexually transmitted diseases (STDs) have been found to be correlated with efficient transmission of HIV,[4] risk exposures in these high prevalence locations are an important area of study.

The U.S. Department of Defense (DoD) responded to the emergence of HIV/AIDS with HIV screening, surveillance, and healthcare policies.[5] A 1985 U.S. DoD directive instituted mandatory routine HIV testing among military personnel.[5] This initiated the ongoing collection and maintenance of military personnel HIV test results, both seronegative and seropositive.

While HIV infection is not common among U.S. military personnel, it is a disease of great personal and societal consequence. Service members who become infected with HIV require specialized diagnostic and treatment services, and, under agreements with foreign governments, cannot be assigned outside of the United States.

The periodic testing of military personnel has led to a uniquely well-characterized cohort of HIV-seropositive persons. First, because of mandatory HIV testing and the maintenance of testing records, the period of time between the last negative HIV test and the first positive test, known as the seroconversion window, can be estimated. HIV study participants can be surveyed for their geographic locations, risk factor characteristics, and behaviors during that defined time frame, yielding more accurate assessments than a study population where there may not be a last known or a relatively recent negative HIV test date. Second, due to the DoD random illicit drug testing policy, this population has a very low rate of illicit drug use, and an especially low IDU rate. Consequently, IDU, a major risk factor for HIV seroconversion in the U.S. population, is generally not a risk factor in this population. Lastly, among this military population of HIV-infected persons, people of all sexual orientations are included. Thus, we have a population of HIV-seropositive persons with a defined window of seroconversion, who are non-IDU, of all sexual orientations, with easy and equal access to healthcare.

This study has its roots in a long history of military STD and HIV research. In 1990, a study was conducted investigating the demographic characteristics of HIV-seropositive Navy and Marine personnel screened during 1986 and 1988. Using the Naval Health Research Center (NHRC) HIV Central Registry matched to the Service History File database, researchers found an HIV point prevalence of 1.5 per 1,000 persons. The HIV prevalence was higher among males, those aged 25-29 years, Navy personnel compared with Marines, enlisted personnel compared

with officers, those of African-American ethnicity, those with more than a high school education, and those with 4-5.9 years of service.[6] This study provided one of the first glimpses into the epidemiology of HIV infection in the Navy and Marine Corps.

Another analysis of data from the Navy HIV Central Registry at NHRC, 1986-1989, showed decreasing trends in the rate of seroconversion among U.S. active-duty enlisted personnel.[7] The rate of newly identified seropositive Navy enlisted personnel fell from 3.6 in the first quarter of 1986 to 0.5 in the last quarter of 1989. Although the reduced rate of seroconversion in the Navy may have been due to the exclusion of HIV-seropositive service applicants and applicants with high-risk behaviors, the reduction in HIV-seropositive rates was seen in other services as well.

As the military has responded to the threat of HIV, educational programs have been developed addressing this specific issue. As early as 1985, the Army was providing HIV prevention education to its service members. In 1998 researchers sought to determine if Army personnel were actually receiving HIV prevention training, and if so, whether it made a difference in their risk behavior. A total of 1,377 soldiers were enrolled in the study. Participants filled out self-administered surveys indicating whether they had received HIV education and also provided information about their sexual risk behavior. The study concluded that there was no difference in the sexual behavior of Army personnel who had received HIV education compared with the nearly 25% of participants who reported not having received any HIV education while in the Army. The authors postulated that the reason no difference was seen between the groups was because the educational sessions to which Army personnel had been exposed were not of sufficient length, repeated often enough, or of a nature sufficiently conducive to effecting behavioral change.[8]

Understanding risk factors for HIV infection among military personnel is key to addressing HIV risk reduction in this population. However, a potential deterrent to the collection of risk factor data is the military's Uniform Code of Criminal Justice, which states that engaging in homosexual acts or using illicit drugs are cause for discharge. Many believe that this policy is a contributing factor to the inability of healthcare providers to collect any risk factor information during counseling sessions. A case-control study was designed to address the issue of U.S. military personnel nondisclosure of HIV risk and was conducted from 1988 to 1991 by Renzullo et al.[9] Cases in this study were HIV military personnel who had previously not disclosed any HIV risk information. Due to the confidentiality of the study, researchers thought that participants would be more forthcoming with behavioral information than they had been with their usual medical providers. Control subjects were recruited from the same installations where cases were identified and were matched to case participants based on age, race/ethnicity, rank, and length of service. Increased risk of HIV infection was found among men with same-gender partners, poor partner selection, and increased numbers of partners.

Because HIV is an STD, behavioral research designed to study risk factors for more traditional STDs, such as gonorrhea or syphilis, can be used to understand sexual risk behaviors for HIV. During 1989-1991, researchers conducted a study of sexual risk behavior associated with deployment among male Navy and Marine personnel. Surveys were conducted before and after deployment, and acquisition of an STD while on deployment was recorded. They found that prior to deployment, nearly 50% reported contact with a prostitute and 22% had a history of having an STD. Results of the postdeployment surveys indicated that young age, non-white ethnicity, and not being married were all associated with acquisition of an STD while on deployment.[10] This study was conducted 10 years ago and may not reflect current risks for HIV

infection due to the fact that in the intervening years the norms for sexual behaviors have been shaped and changed by the HIV epidemic.

Results from a cross-sectional study of HIV risk behavior conducted among male attendees at an Army STD clinic showed that in the past year 31.1% of the participants had more than 5 partners, 32.3% reported at least one episode of sexual "bingeing," and 37.5% engaged in sex while on leave.[11]

Due to concerns that Navy and Marine personnel in ports of call with high HIV prevalence were at increased risk for HIV infection, a case-control study was undertaken investigating the relationship between visiting foreign ports during 1986 to 1990 and incident HIV infection.[12] This study matched two of the databases previously mentioned, the NHRC HIV Central Registry and the NHRC Service History File and then linked this with ship deployment information supplied by the Chief of Naval Operations. The authors found no increased risk of HIV infection among those deployed to 100 of the most frequently visited ports as compared with personnel who had not been similarly deployed. Clearly, additional studies were needed to collect behavioral risk factor information on an individual level.

Fortunately, the determination of HIV subtypes with their distinct geographical patterns permit a more precise examination of deployment-associated HIV transmission. In 1995, results from one of the first molecular epidemiologic studies of HIV among military personnel were published.[13] HIV-seropositive patients were identified at the HIV medical unit at Naval Medical Center San Diego (NMCSD) and through the Navy HIV Central Registry. Those who reported high-risk sexual activity in an overseas port were invited to participate in the study, and blood was drawn for genotypic characterization. Results of this study revealed that of the 34 participants, 21 were subtype B, 3 were E, 1 was A, and 1 was D. This confirmed that U.S.

military personnel were contracting HIV subtypes endemic to other regions of the world and established the existence of deployment-associated HIV.

This pilot project was expanded into a more comprehensive, DoD study of the behavioral, clinical, and molecular characteristics of recent DoD HIV seroconverters. The DoD Molecular Epidemiology Study (RV117) measured behavioral and biological risk factors, genetic subtype, drug resistance, and clinical features of HIV in a U.S. military population. Enrollment began in February 1997 and continued through June 2001, with 595 HIV-seropositive participants enrolled from 7 sites, including all branches of the military. Participants completed a self-administered survey of demographic, behavioral, and health risks and then allowed additional blood testing for HIV subtype and genotypic drug-resistance patterns.

Preliminary molecular findings from the first 95 participants indicated that U.S. military personnel are at risk for contracting HIV subtypes not usually seen in the United States. The results also showed that among newly HIV-infected, drug-naive patients, some had contracted strains of HIV with already established anti-retroviral drug resistance.[14]

To develop and implement HIV prevention programs for U.S. military personnel, research quantifying the multi-faceted risk factors for HIV infection in this population must be continued. This paper provides a cross-service comparison of the self-reported demographic, epidemiologic and behavioral risk factor data collected as part of the RV117 study.

Methods

Study Design

Participants were recruited to this study upon referral to one of seven designated HIV/infectious disease clinical centers. Centers entered the study in the following order:

February 1997, NMCSD; November 1997, Wilford Hall Medical Center (WHMC); December 1997, Naval Medical Center Portsmouth (NMCP); January 1998, National Naval Medical Center (NNMC); February 1998, Walter Reed Army Medical Center (WRAMC); March 2000, Brooke Army Medical Center (BAMC); September 2000, Tripler Army Medical Center (TAMC). Each participating site had a principal investigator who was an infectious disease specialist and a clinical site nurse specifically trained to facilitate the RV117 study. The site nurse acted as the research coordinator for the study.

The participants were approached during their initial seropositive confirmatory visit, at a 6- or 12-month follow-up appointment, or at a scheduled blood draw. The initial visit length varied by location. NMCSD, WHMC, NMCP, and NNMC had a two-week initial evaluation period while WRAMC, BAMC, and TAMC had a 3-day initial visit. Eligibility criteria for participation in the RV117 study were (1) HIV seroconversion documented by whole virus enzyme immunoassay testing followed by Western blot assay, (2) first positive HIV test within 3 years of RV117 consent date, (3) active duty at the time of seroconversion, 4) at least 18 years of age, and 5) able to have blood drawn.

All HIV-seropositive U.S. military personnel who agreed to participate in the RV117 study received Institutional Review Board documents developed in compliance with Federal regulations at each participating hospital. Participants who gave their informed consent to participate had blood drawn and completed a survey assessing demographics, sexual health and behavior, and alcohol and drug use. (See Appendix A for a copy of the survey.) A medical record review was also done to collect clinical information. Their study number alone identified participants. All personally identifying information was removed.

The clinical site nurse assigned each participant a 4-digit code and kept the only documentation linking the name and identification number in a logbook that was secured at all times. No names or social security numbers were attached to the questionnaires, laboratory results, or supplemental data. The identification number indicated the site of participation but revealed no patient identifying information. The RV117 coordinating center knew the participants by these 4-digit codes alone. At no time did the RV117 researchers at the coordinating site have access to the logbook. To further maintain confidentiality, the clinical site nurse, who had access to identifying information, did not have access to the completed questionnaires. Participants sealed their completed questionnaire in an envelope and either dropped it into the slot of a locked cabinet only to be withdrawn by the project coordinator for mailing, or placed the envelope directly into a Federal Express or U.S. Postal Service mailbox.

The coordinating center at NHRC received questionnaires, medical record review sheets, and laboratory results from each participating site. Once received at the coordinating center, all questionnaires were maintained in locked file cabinets. Data were double key-entered and computer files were accessible only with security codes. All data analyses were done at the coordinating center.

Survey Instrument

Demographics

Demographic characteristics of the participant were collected. These included age, gender, ethnicity, marital status, educational attainment, and rank.

Testing Behavior

Participants were queried about their HIV testing behavior. Specifically, participants were asked where they had been tested. They were also asked if they had requested an HIV test

and if so, how many times and why. Additionally, participants were asked if they had received an HIV test outside of military facilities and if they had done so more than once.

Seroconversion Window

Reporting of the last negative HIV test and the first positive test was done either by polling the HIV surveillance log, review of laboratory records, or by participant self-report, depending on the site. From these dates the seroconversion window (the span of time from the last negative HIV test to the first positive HIV test), the estimated length of infection at time of diagnosis, the length of time from last negative test to consent, and the length of time from first positive test to consent date were calculated. The length of infection at the time of diagnosis was estimated as half of the seroconversion window. Therefore, each study participant had a unique seroconversion window to reference when reporting risk behaviors. The length of the seroconversion window and the time interval between a subject's first positive test and study enrollment both reflect the extent to which the participant had to rely on long-term memory when reporting detailed information about potential risk factors.

Seroconversion Illness

Participants were asked if they had specific illness symptoms during their seroconversion window, and if so, had they sought medical care or been unable to participate in specific activities because of the illness. In addition, their medical records were reviewed to see if healthcare personnel had recorded symptoms of seroconversion illness.

Sexual Risk Factors

The risk factor assessment for sexual behaviors encompassed a number of topics and included several survey questions. With the exception of age at first intercourse and number of lifetime partners, the questions dealt solely with behaviors during the seroconversion window.

The type of sexual contact, either heterosexual, men who have sex with men (MSM), or bisexual, was determined by using a combination of questions in the survey. Two questions were used to establish whether there had been strictly female, male, or bisexual sexual contact during the window. All of the condom use questions in the survey had the following choices: never, sometimes, always, don't know, and "haven't had (site of) intercourse." Estimated frequencies of condom use were categorized for anal intercourse, vaginal intercourse, and oral intercourse.

Sexually Transmitted Disease History

The variable "positive history of STD" was subdivided into two categories: ever and during the seroconversion window. This breakdown provided more specific STD history information. The "ever" category included participants who indicated in the affirmative having had any of the following STDs during their lifetime: gonorrhea, nongonococcal urethritis (NGU), genital warts, anal warts, hepatitis B, chlamydia, syphilis, genital herpes, or rectal herpes. The "during the window" category included the same STDs, but was specific to individuals answering yes to the questions about infection between their last negative test and first positive test.

Alcohol and Drug Use

Alcohol use was classified by the following categories used by the DoD: (1) abstain, (2) infrequent/light, (3) moderate, (4) moderate/heavy, and (5) heavy. The variables from this study were similar to those used by the DoD and therefore translated into nearly equivalent categories. The following algorithm used the "days per week of drinking" and "drinks per day" variables collected in the survey. An *abstainer* was defined as one who answered "None" to both the days per week and the drinks per day. Additionally, if the participant answered "None" to drinks per day, and then did not answer the days per week, they too were categorized as an abstainer. An

infrequent/light drinker was defined as one who drinks 0-3 drinks per day, less than one day per week, or who did not answer the number of drinks per day and drinks less than one day per week. A *moderate* drinker was defined as one who drinks 1 drink, 1 or more days per week, or 4 drinks less than once per week. A *moderate/heavy* drinker was defined as one who drinks 2-4 drinks per day at least once per week, or who did not answer the number of days per week and drinks at least 5 drinks per day less than once per week. A *heavy* drinker was one who drinks at least 5 drinks per day 1 or more days per week, or who did not answer the number of days per week. Figure 1 graphically describes this algorithm.

Drinking in public was coded as "Yes" if the participant had been cited for an open container in public or cited for public intoxication. Drinking and driving was coded as "Yes" if the participant reported he or she had been cited for either driving under the influence or driving while intoxicated.

Figure 1: Algorithm for Categorization of Drinking Levels

Days Per Wk / Drinks Per Day	0	1	2	3	4	5	6	7	NA	<1
0	A								A	I
1		M	M	M	M	M	M	M	M	I
2		MH	MH	MH	MH	MH	MH	MH	MH	I
3		MH	MH	MH	MH	MH	MH	MH	MH	I
4		MH	MH	MH	MH	MH	MH	MH	MH	M
5-12+		H	H	H	H	H	H	H	H	MH
NA										I

A: Abstain
I: Infrequent/Light
M: Moderate
MH: Moderate/Heavy
H: Heavy

Parenteral Risk

Participants were asked if they had received a tattoo or body piercing during the seroconversion window. If they responded in the affirmative, they were asked to identify the country in which the procedure was done. They were also asked if they had experienced a needle-stick injury during the same time frame.

Geographic Location of Sexual Contacts

Participants were asked a few questions about the geographic location of their sexual contacts. The questionnaire contained a sexual history chart, which required details on the geographic location of each sexual contact. If they provided information on this chart, it was used to determine if there had been any sexual contact and where. Another question asked about sexual contact while in a foreign land. Information from this question was used in conjunction with the chart to determine geographic location of sexual contact.

Military Status

Participants reported on their military status—active duty, reserves, or retired—during their seroconversion window. They were also asked whether they were on permanent assignment, leave, deployed, or temporary additional duty (TAD).

Self-Reported Risk Circumstance

A list of possible reasons for placing oneself at risk for infection was provided to the participants. They were asked to check any of the choices that might have applied to them.

STD Education

Participants were asked if they had received any military STD education in the 3 years prior to their enrollment in the study.

Statistical Analysis

Descriptive statistics including basic frequencies and distributions of the variables are reported. Percent response uses the denominator of the total responses to the survey question. Analysis was done using both SAS (SAS 8.00 ed., 1999, SAS Institute, Inc., Cary, NC) and SPSS (SPSS Release 10.1.0, 2000, SPSS Inc, Chicago, IL) statistical analysis programs.

Results and Discussion

Study Population

Participants were enrolled from February 1997 through July 2001. Of 818 HIV seropositive military personnel eligible for inclusion in the study, 756 were approached for participation and 603 consented to participate in the study, for a 74% overall rate of enrollment. The results reflected a substantial variation in the enrollment rates of eligible subjects between sites and across services. Table 1 displays the site enrollment dates and the participation rates for each site.

The difference in enrollment rates was most likely due to differences in the length of the initial evaluation period. NMCSD, NNMC, WHMC, and NMCP all provide 2 weeks of evaluation, counseling, and education to those with newly detected HIV infection, while WRAMC, BAMC, and TAMC provide 3 days of services. However, in the case of WHMC, since the Air Force HIV screening is less frequent, personnel were typically enrolled as re-evaluation visits. These visits are only 3 days in length and likely contributed to the low enrollment rate. It was during this time that personnel were offered the opportunity to participate in the RV117 study, as well as any other studies that might have been appropriate. The sites offering a longer period of inpatient services had more time available for study recruitment,

hence higher participation rates. However, this does not explain the 96% enrollment rate at BAMC, a 3-day program.

During the early stages of study participation, a site tends to enroll more people who are at the medical facility for a follow-up visit as opposed to an initial evaluation. These individuals have known about their HIV infection for a while and are coming in for routine care. It is generally easier to enroll participants at these visits because they have had time to adjust to their serostatus and are more likely to be approachable and agreeable to participation in a research study.

Of the 603 enrolled, 5 of the individuals failed to meet the study criteria and 3 others were excluded from the study due to consent issues. Additionally, there were 2 participants provided medical, but not behavioral, information. Due to the small number of Coast Guard participants (5), their results were also not included. Therefore, we report the demographic, epidemiologic and behavioral results of 588 HIV-seropositive military personnel.

Table 1: RV117 Participating Sites and Participation Rates

Location	Hospital	Branch	Start Date	Eligible	Briefed	Enrolled	%
San Diego	NMCSD	Navy	2/24/97	197	197	191	96.9
San Antonio	WHMC	Air Force	11/18/97	177	144	88	49.7
Portsmouth	NMCP	Navy	12/22/97	121	120	101	83.5
Washington	WRAMC	Army	2/18/98	158	135	86	54.4
Bethesda	NNMC	Navy	1/16/98	128	128	108	84.4
San Antonio	BAMC	Army	3/15/00	28	27	27	96.4
Tripler, HI	TAMC	Army	9/11/00	9	5	2	22.2
Total				818	756	603	73.7

Demographics

The demographic characteristics of the RV117 participants are shown in Table 2. Nearly all of the RV117 participants were male. The mean age of the participants was approximately 30,

with the Marines being the youngest, reporting a mean age of 28.1 years. Blacks were overrepresented in the RV117 study. Among the Army participants, 64% identified themselves as black, with 46% of Navy participants, 44% of the Marines, and 24% of the Air Force reporting the same. The next largest ethnic/racial group represented was white, although as compared with the general DoD population, both they and Hispanics were underrepresented. With the exception of the Army, of whom only 38% reported single marital status, most of the branches showed a high percentage of participants who classified themselves as single. The Army participants reported the highest rates of being married and living together (30%). The rates of being separated and divorced were similar across the services. Among the Navy and Marines, more participants report high school as their highest educational attainment, while most of the Army and Air Force participants had at least some college education.

Table 2: Demographic Characteristics of RV117 Cohort

		Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Age, y					
	Mean	29.5	28.2	29.9	31.0
	Range	18-52	19-42	19-57	19-46
Gender					
	Male	314 (98.7)	70 (96)	101 (90.2)	83 (97.7)
	Female	4 (1.3)	3 (4.1)	11 (9.8)	2 (2.4)
Race/ethnicity					
	Black	147 (46.2)	32 (44.4)	72 (64.3)	20 (23.5)
	White	126 (39.6)	29 (40.3)	31 (27.7)	42 (49.4)
	Hispanic	24 (7.6)	11 (15.3)	5 (4.5)	6 (7.1)
	American Indian	1 (0.3)	0	1 (0.9)	0
	Filipino	2 (0.6)	0	0	1 (1.2)
	Pacific Islander	1 (0.3)	0	0	1 (1.2)
	Other	17 (5.4)	0	3 (2.7)	15 (17.7)
Marital status					
	Single	189 (59.4)	40 (54.1)	43 (38.4)	50 (58.8)
	Married (live apart)	28 (8.8)	5 (6.8)	17 (15.2)	6 (7.1)
	Married (live together)	46 (14.5)	14 (18.9)	33 (29.5)	13 (15.3)
	Separated	17 (5.4)	7 (9.5)	6 (5.4)	1 (1.2)
	Divorced	37 (11.6)	8 (10.8)	13 (11.6)	15 (17.7)
Education					
	< High school	1 (0.3)	0	0	0
	High school	134 (42.4)	33 (46.5)	28 (25.0)	3 (3.5)
	Some college	112 (35.4)	27 (37.0)	47 (42.0)	43 (50.6)

Associate degree	41 (13.0)	6 (8.5)	14 (12.5)	23 (27.1)
Bachelor's degree	17 (5.4)	5 (7.0)	13 (11.6)	7 (8.2)
Postgraduate work	5 (1.6)	0	3 (2.7)	5 (5.9)
Postgraduate degree	6 (1.9)	0	7 (6.3)	4 (4.7)

The military ranks of the participants are shown in Table 3. Across the services, the majority of the participants were ranked E4-E6.

Table 3: Military Rank

		Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Rank					
	E1-E3	53 (17.3)	21 (30.4)	20 (18.4)	9 (11.1)
	E4-E6	219 (71.3)	37 (53.6)	64 (58.7)	62 (76.5)
	E7-E9	22 (7.2)	9 (13.0)	14 (12.8)	1 (1.2)
	O1-O3	8 (2.6)	2 (2.9)	6 (5.5)	8 (9.9)
	O4 and above	5 (1.6)	0	5 (4.6)	1 (1.2)

Testing Behavior

Information relating to HIV testing is shown in Table 4. Although other venues were reported, the vast majority of the HIV testing documenting the seroconversion window took place at military facilities. Air Force participants reported the highest rate of nonmilitary testing, with 18% reporting civilian test site use. Participants requesting HIV tests from the military was common, with 14-34% of participants, by service, reporting they had requested a test. The most common reason stated for requesting an HIV test was engaging in unsafe sex. A small percentage of participants reported that the reason they had requested a test was that they had an HIV-seropositive partner. In addition to the HIV tests done at military facilities documenting the seroconversion window, personnel eventually testing positive reported previously having HIV tests done at civilian test sites. A nonmilitary HIV test was reported by 33% of Air Force participants, 16% of Army participants, and 14% of Navy and Marine participants.

Table 4: Testing Behavior

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Location of documented tests				
Military facility	307 (96.5)	70 (95.9)	111 (99.1)	75 (88.2)
Civilian clinic or hospital	28 (8.8)	5 (6.9)	5 (4.5)	15 (17.7)
Home testing	3 (0.9)	0	0	1 (1.2)
Other	3 (0.9)	2 (2.7)	0	1 (1.2)
Nonmilitary test ever	44 (13.8)	10 (14.1)	18 (16.4)	28 (33.3)
More than 1 test nonmilitary	35 (44.3)	2 (15.4)	6 (24.0)	16 (57.1)
Received self-requested test at military facility	81 (25.8)	10 (13.9)	38 (34.2)	22 (25.9)
Number of times self-requested				
1-2 times	68 (86.1)	10 (100)	30 (76.9)	19 (90.5)
3-5 times	10 (12.7)	0	8 (20.5)	1 (4.8)
> 5 times	1 (1.3)	0	1 (2.6)	1 (4.8)
Reason requested				
Unsafe sex	37 (11.6)	3 (4.1)	15 (13.4)	14 (16.5)
HIV+ partner	7 (2.2)	0	3 (2.7)	0
Other	44 (13.8)	7 (9.6)	25 (22.3)	10 (11.8)

Seroconversion Window and Time to Enrollment

The length of time for which participants report behavior has a direct bearing on the amount of behaviors that are reported. For this study most of the survey questions addressed behavior within the participant's seroconversion window. The mean seroconversion window length ranged from 16.6 months in the Marines to 29 months in the Air Force. The median was between 12 and 19.5 months when analyzed by service. The median length of infection, estimated as half the seroconversion window, ranged from 6.0 to 8.5 months among all of the services.

As previously stated, participants were enrolled in the study either during their initial visit, or at a separate follow-up visit for HIV infection. Results evaluated by type of visit at enrollment showed similarities between the mean and median lengths of infection for the initial and follow-up groups in the Navy and Marines. However, larger differences between the groups were seen among the Army, 8.0 versus 9.8 months, and the Air Force, 8.5 versus 11.0 months,

respectively. Additional comparisons between the initial and follow-up groups showed significant variation in the time span from the first positive HIV test to the time of study consent. For example, the difference between the group means was as great as 20 months for the Air Force subjects. A similar trend was seen in the time span from the last negative HIV test to the time of study consent. Once again the Air Force showed the largest discrepancy, with an initial mean of 27.8 months and a follow-up mean of 54.7 months. The mean, median, and ranges of each time frame, in months, are reported in Table 5.

The Air Force participants reported the longest seroconversion windows and time from last negative HIV test to study consent. Therefore, they reported over a longer time frame and had more chance of recall bias. In addition, more risk behaviors were quantified over a longer period of time than for those in other services. For example, if a person had 2 sexual partners per year and they reported their sexual history for 1 year, they would say they had two partners. If the same person reported on 3 years of behavior, that number might triple and they would report 6 partners. The longer seroconversion windows with less frequent military testing, may explain the higher proportion of Air Force personnel who sought nonmilitary HIV testing.

Table 5: Seroconversion Window Time Frames (Months)

	Navy $n = 318$			Marines $n = 73$			Army $n = 112$			Air Force $n = 85$		
Visit type at enrollment	All	I	FU	All	I	FU	All	I	FU	All	I	FU
Initial (I)/follow-up (FU)(n)		180	134		48	24		37	72		43	39
Estimated length of infection												
Mean	9.0	9.1	8.9	8.3	8.6	7.9	10.1	8.7	11.1	14.5	12.7	16.1
Median	6.5	6.5	7.0	6.0	6.3	5.7	8.5	8.0	9.8	8.5	8.5	11.0
Range	1-65	1-65	1-39	1-37	1-37	2-30	1-55	1-23	1-55	1-73	1-55	1-73
Time from last neg to 1st pos test												
Mean	18.0	18.2	17.8	16.6	17.1	15.8	20.3	17.3	22.2	29.0	25.4	32.2
Median	13.0	13.0	14.0	12.0	12.5	11.4	17.0	16.0	19.5	17.0	17.0	22.0
Range	1-130	1-130	1-77	1-74	1-74	4-60	1-109	1-46	1-109	2-145	2-109	2-145
Time from 1st pos to consent												
Mean	9.2	1.9	18.7	8.1	2.0	19.2	11.6	2.2	16.3	12.6	2.5	22.6
Median	2.6	1.8	17.7	2.5	1.6	19.6	8.2	1.7	14.1	7.3	1.8	20.8
Range	0-46	9-13	1-46	1-35	1-5	5-35	0-42	0-14	2-42	1-41	1-13	7-41
Time from last neg to consent date												
Mean	27.2	20.1	36.5	24.7	19.1	35.1	31.9	19.5	38.5	41.6	27.8	54.7
Median	21.3	15.1	34.1	23.1	14.4	31.3	28.7	17.4	35.0	36.5	18.6	45.9
Range	1-132	1-132	5-108	3-79	3-75	9-79	5-141	5-50	7-141	3-152	3-111	12-153

Seroconversion Illness

One of the most important findings of this study was the high rate of participants who sought medical care for symptoms indicative of seroconversion illness. Although we can not definitively quantify self-reports of previous illness as acute retroviral syndrome (ARS), the results are consistent with, if not lower than, the current U.S. data.[15,16] In this study, 58-69% of the study participants reported having symptoms and of these, 75% sought medical care.

Symptoms of seroconversion illness experienced during the seroconversion window are reported in Table 6. The most common symptoms reported were fever, sore throat, and headache; approximately half of participants reported these symptoms. Other symptoms commonly reported by participants were rash and joint pain. Reporting the highest rates of symptoms were the Air Force participants. Across the services, 45-55% of the participants sought medical care for their symptoms. The symptoms were severe enough to prevent 17-40%

of the Navy, Marine, Army, and Air Force participants from engaging in work, exercise, and social activities. A medical record review by the study researchers showed that 38% of the Army participants, 44% of the Navy participants, 48% of the Air Force participants, and 62% of the Marine participants had documented symptoms of seroconversion illness.

This is obviously an area that warrants further study. Prompt diagnosis of primary ARS can result in reduced transmissibility of HIV by allowing early initiation of prevention measures on the part of the HIV-seropositive patient. Similarly, early medical care gives the physician and the patient more treatment options that may result in reduced morbidity and increased quality of life.

Table 6: Seroconversion Illness

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Self-reported symptoms				
Fever	158 (49.7)	36 (49.3)	44 (39.3)	43 (50.6)
Sore throat	131 (41.2)	34 (46.6)	40 (35.7)	44 (51.8)
Headache	119 (37.4)	28 (38.4)	31 (27.7)	44 (51.8)
Rash	36 (11.3)	6 (8.2)	15 (13.4)	12 (14.1)
Joint pains	52 (16.4)	18 (24.7)	15 (13.4)	18 (21.2)
Hepatitis	11 (3.5)	0	3 (2.7)	3 (3.5)
No illness	104 (32.7)	25 (34.2)	47 (42.0)	26 (30.6)
Sought medical care for symptoms	158 (49.7)	35 (47.9)	50 (44.6)	47 (55.3)
Symptom affects on activity				
Prevented work	91 (28.6)	21 (28.8)	26 (23.2)	34 (40.0)
Prevented exercise	87 (27.4)	21 (28.8)	22 (19.6)	30 (35.3)
Prevented social activities	90 (28.3)	18 (24.7)	19 (17.0)	29 (34.1)
Did not prevent activity	103 (32.4)	26 (35.6)	38 (33.9)	21 (24.7)
Seroconversion illness per medical history	141 (44.3)	45 (61.6)	42 (37.5)	41 (48.2)

Sexual Risk Factors

Participants were surveyed regarding sexual practices during the seroconversion window that might have increased their risk for HIV infection. Table 7 displays the results of those questions. Exposure to blood during sex, either through traumatic tearing or menstrual blood, was reported by 50% of Army, 51% of Marine, and 45% of Navy and Air Force participants. Anal sex was reported by 41-75% of the participants by service. Engaging in group sex was

reported by 36% of Air Force, 27% of Navy, 19% of Army, and 14% of Marine participants. Having concurrent partners (more than one sex partner during a given period of time) was reported by 9-13% of the participants across services. The majority (70-88%) of the participants reported never or only sometimes using condoms for vaginal or anal sex. Almost no use of condoms was found for oral sex.

The mean age of first sexual intercourse ranged from 15.1 to 16.4 years of age. Among the male participants, 64% of Marines, 61% of the Army, 35% of the Navy, and 26% of the Air Force reported heterosexual contacts only. The median number of sexual partners reported during the seroconversion window was Air Force, 6.5; Navy and Marines, 5; and Army, 4. The median number of lifetime partners was 28.5 for the Air Force, and 20 for the Navy, Marines, and Army. During the seroconversion window, engaging in sex on the first encounter was reported by 67-74% of the participants by service. Having sex with a commercial sex worker during the seroconversion window was reported as follows: 19% of Navy and Marines, 13% of Army, and 7% of Air Force. Engaging in intercourse during the seroconversion window with someone known (or assumed) to be HIV seropositive was reported by 31% of Marine, 29% of Army, 25% of Navy, and 21% of Air Force participants.

Table 7: Sexual Risk Factors for HIV Infection

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Age at first intercourse (mean)	16.1	15.1	15.6	16.4
Type of sexual contact during window				
Males				
Heterosexual	104 (35.0)	42 (63.6)	58 (61.7)	21 (27.3)
MSM	126 (42.4)	12 (18.2)	22 (23.4)	33 (42.9)
Bisexual	67 (22.6)	12 (18.2)	14 (14.9)	23 (29.9)
Females				
Heterosexual	4 (100.0)	3 (100.0)	10 (90.9)	2 (100.0)
Lesbian	0	0	0	0
Bisexual	0	0	1 (9.1)	0
Number partners				
Seroconversion window				
Mean	16.7	8.3	7.8	22.6
Mode	3.0	1.0	2.0	1.0
Median	5.0	5.0	4.0	6.5
Lifetime				
Mean	62.0	69.1	37.9	67.7
Mode	10.0	6.0	20.0	50.0
Median	20.0	20.0	20.0	28.5
Poor partner selection characteristics				
Sex on first encounter	217 (68.2)	49 (67.1)	75 (67.0)	63 (74.1)
Sex with CSW	46 (19.5)	14 (19.2)	14 (12.5)	6 (7.1)
Sex with HIV+	78 (24.5)	23 (31.1)	32 (28.6)	18 (21.2)
Sexual practices				
Blood during sex	144 (45.3)	37 (50.7)	56 (50.0)	38 (44.7)
Anal sex	221 (69.5)	30 (41.1)	60 (53.6)	64 (75.3)
Group sex	84 (26.8)	10 (13.9)	21 (18.9)	29 (36.3)
Concurrent partners	39 (12.3)	8 (11.0)	10 (9.0)	11 (13.3)
Condom use: never/sometimes *				
Vaginal	142 (74.7)	51 (87.9)	71 (82.6)	36 (81.8)
Anal	170 (72.0)	28 (70.0)	53 (74.7)	55 (83.3)
Oral	268 (96.7)	62 (98.4)	96 (99.0)	75 (100)

*Percent reflects non-missing data.

MSM, men who have sex with men; CSW = commercial sex worker

Sexually Transmitted Diseases

The self-reported STD history is shown in Table 8. Ever having any STD was reported by 33-44% of the participants, by service. Having an STD during the seroconversion window was reported by 19-26% of the participants. Gonorrhea was the most reported STD during the

seroconversion window, with 10% of Army, 8% of Navy, 6% Air Force, and 5% of Marines reporting this illness. Genital herpes during the seroconversion window was reported by 3-9% of the participants. Rates for anal and genital warts, chlamydia, hepatitis B, NGU, and syphilis are also shown in Table 8.

Table 8: Self-Reported Sexually Transmitted Disease (STD) History

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
STD ever*	141 (44.3)	29 (39.7)	48 (42.9)	28 (32.9)
STD during window				
Any STD*	80 (25.2)	14 (19.2)	29 (25.9)	17 (20.0)
Anal warts	13 (4.3)	0	4 (3.9)	3 (3.7)
Chlamydia	11 (3.6)	3 (4.6)	7 (6.8)	1 (1.3)
Genital herpes	14 (4.6)	5 (7.6)	9 (8.6)	2 (2.5)
Genital warts	13 (4.3)	4 (6.2)	4 (3.9)	0
Gonorrhea	25 (8.2)	3 (4.6)	10 (9.6)	5 (6.3)
Hepatitis B	12 (3.9)	2 (3.1)	3 (2.9)	3 (3.8)
NGU	8 (2.6)	1 (1.5)	3 (2.9)	2 (2.5)
Syphilis	7 (2.3)	0	2 (1.9)	2 (2.5)

*Includes all listed STDs.
NGU, nongonococcal urethritis.

Alcohol and Drug Use

Using alcohol at moderate/heavy or heavy levels was reported by 54-69% of the participants, by service. Additionally, by service 27-45% reported a history of alcohol abuse. In comparison, analysis of the 1998 DoD Survey of Health-Related Behaviors Among Military Personnel (DoD Survey) indicated that a significantly smaller percentage of their population, 33-45%, had similar levels of alcohol consumption.

Self-reported drug and alcohol use histories during the seroconversion window are shown in Table 9. Moderate/heavy alcohol use was reported by 37-45% of the participants, across services. Heavy use was reported by 12-32% of the participants, by service, while 13-27% reported abstaining from alcohol use. Infrequent or light alcohol consumption was reported by 9-27% of participants, and moderate use was reported by 2-6% of participants, by service. Engaging in sex while under the influence of alcohol was reported by 55-63% of Navy, Marine,

Army, and Air Force participants. Additionally, 40-47% of the participants reported failure to use condoms due to being under the influence of alcohol. Using marijuana was reported by 6-11% of the participants, by service. Nitrate inhalants were used by 3-11% of Navy, Marine, Army, and Air Force participants.

Table 9: Alcohol and Drug Use

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Alcohol use				
Abstain	45 (14.7)	13 (18.3)	29 (26.4)	11 (12.9)
Infreq/light	47 (15.4)	6 (8.5)	17 (15.5)	23 (27.1)
Moderate	18 (5.9)	3 (4.2)	2 (1.8)	5 (5.9)
Mod/heavy	127 (41.5)	26 (36.6)	49 (44.6)	36 (42.4)
Heavy	69 (22.6)	23 (32.4)	13 (11.8)	10 (11.8)
Alcohol abuse history*	117 (36.8)	33 (44.6)	35 (31.3)	23 (27.1)
Ever referred for alcohol screening	32 (10.4)	10 (13.7)	9 (8.1)	7 (8.2)
Ever participated in alcoholism program	28 (9.1)	8 (11.0)	10 (8.9)	5 (5.9)
Ever attended AA meeting	47 (15.4)	11 (15.1)	7 (6.4)	7 (8.2)
Ever cited for:				
Drinking in public**	10 (5.0)	7 (9.6)	7 (6.3)	5 (5.9)
Drinking and driving ***	30 (9.4)	15 (20.6)	8 (7.1)	4 (4.7)
Ever drank until blacked out	85 (27.6)	23 (31.5)	28 (25.0)	19 (22.4)
Sex under the influence of alcohol	199 (62.6)	46 (63.0)	61 (54.5)	52 (61.2)
No condom due to alcohol use	123 (40.3)	33 (46.5)	47 (42.0)	36 (42.4)
Drug use				
Marijuana	22 (7.1)	6 (8.2)	12 (11.0)	5 (5.9)
Nitrate inhalants	28 (9.1)	2 (2.8)	7 (6.4)	9 (10.6)
Cocaine	8 (2.6)	0	2 (1.8)	3 (3.5)
Amphetamine	9 (2.9)	0	2 (1.8)	1 (1.2)
LSD	5 (1.6)	0	2 (1.8)	0
Barbiturates	1 (0.3)	0	0	0
PCP	1 (0.3)	0	0	0
IDU	0	0	0	0
Steroids by injection	0	0	0	1 (1.2)

*Based on self-reported history of alcohol-related citations, referral for alcohol screening, blackouts, and participation in a program for problem drinking or alcoholism.
**Includes citations for public intoxication and having an open container.
***Includes both Driving Under the Influence (DUI) and Drinking While Intoxicated (DWI).
AA, Alcoholics Anonymous; IDU, injection drug use

Parenteral Risk

Table 10 shows risk behaviors during the seroconversion window related to potentially contaminated needles, body piercing, and tattooing equipment. Having a piercing done was

reported by 6-16% of the participants. Tattoos were reported by 12-18% of the participants, and accidental needle sticks were reported by 3-5% of the participants.

Table 10: Parenteral Risk Behavior During Seroconversion Window

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force n 85 (%)
Body piercing	49 (15.5)	4 (5.6)	10 (9.1)	8 (9.4)
Tattoos	38 (12.3)	12 (16.7)	20 (18.0)	13 (15.3)
Accidental needle stick	8 (2.6)	2 (2.8)	5 (4.5)	4 (4.8)

Geographic Location of Sexual Exposure

The geographic locations of sexual exposure are shown in Table 11. Sexual contact only in the United States was reported by 58-64% of the participants. Having sexual contact only in foreign countries was reported by 9-18% of the participants, while contact in both the United States and foreign countries was reported by 18-31% of the participants.

Table 11: Geographic Location of Sexual Contacts

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
United States only	214 (70.6)	45 (63.4)	63 (58.3)	52 (64.2)
Foreign only	24 (7.9)	13 (18.3)	12 (11.1)	7 (8.6)
United States and foreign	65 (21.5)	13 (18.3)	33 (30.6)	22 (27.2)

Military Status at Time of HIV Infection

Participants were asked about their military status at the time of suspected HIV infection. Slightly more than half of all of the participants reported that they were on permanent assignment when they believe they were infected. By service, 62% of Air Force, 50% of both the Navy and Army, and 48% of the Marines reported being on permanent assignment. Leave status was reported by 13% of Army, 10% of Marine, 8% of Navy, and 7% of Air Force participants. Suspected infection while on TAD was reported by 10% of Army, 7% of Air Force, 6% of Navy, and 5% of Marine participants, while 14% of Marine, 8% of Navy, 4% of Army, and 1% of Air Force participants reported a deployed status (see Table 12).

Table 12: Military Status at Suspected Time of Infection

	Navy $n = 318$ (%)	Marines $n = 73$ (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Permanent assignment	159 (50.0)	35 (48.0)	56 (50.0)	53 (62.4)
Leave	26 (8.2)	7 (9.6)	15 (13.4)	6 (7.1)
Deployed	27 (8.5)	10 (13.7)	4 (3.6)	1 (1.2)
Temporary additional duty (TAD)	19 (6.0)	4 (5.5)	11 (9.8)	6 (7.1)
Other	26 (8.2)	5 (6.9)	12 (10.7)	4 (4.7)
Do not know	56 (17.6)	12 (16.4)	12 (10.7)	14 (16.5)
Missing	5 (1.6)	0	2 (1.8)	1 (1.2)

Self-Reported Risk Circumstance

Participants were asked if there were circumstances that they thought put them at risk for infection. The results are shown in Table 13. Nearly half of the respondents, across the services, reported that they did not think it could happen to them. Depression was listed by 6-9% of the participants. Only a few participants endorsed the idea that peer pressure caused them to be at risk or that they wanted to become infected with HIV.

Table 13: Reasons Why Put Self at Risk for HIV Infection

	Navy $n = 318$ (%)	Marines n = 73 (%)	Army $n = 112$ (%)	Air Force $n = 85$ (%)
Psychological circumstances				
Didn't think it would happen to me	154 (48.4)	35 (47.9)	52 (46.4)	42 (49.4)
Depression	27 (8.5)	4 (5.5)	8 (7.1)	8 (9.4)
Peer pressure	6 (1.9)	1 (1.4)	1 (0.9)	1 (1.2)
Wanted to get HIV	1 (0.3)	0	2 (1.8)	0

Prior STD Education

The questionnaire addressed prior STD education by asking the participants if they had received any STD education within the past 3 years. Of the Air Force participants, 42% responded they had not, 16% of Marines responded they had not, 15% of Army personnel said they had not, and 11% of the Navy participants said they had not received any STD education within the past 3 years. These results did not differ by length of service.

Although most of the participants, with the exception of those in the Air Force, showed a high degree of exposure to STD education, it is important to realize that the training received may have occurred a long time ago and since been forgotten. The fact that these individuals have continued to participate in high-risk behaviors leads one to believe that the education, presentation style, or content should be revised and/or provided on a more frequent basis.

Limitations

The largest limitation to this study is the lack of a healthy control group. Without a control group as a reference population, valid, generalizable measures of risk cannot be calculated. A study is presently under way that will allow case-control analysis of the Navy participants. Other limitations to this study are due to recall, volunteer, and social desirability biases. Participants reported behaviors that occurred from the date of their last negative HIV test to their first positive HIV test. This time period ranged from 1-145 months, with a median of 14 months. Obviously it can be quite difficult to reconstruct activities over such long periods of time.[17] Whether participants would have overreported or underreported behaviors, such as sexual activity, condom use, or alcohol consumption, is not clear since there are various reasons for either of these actions.[18-21] Great care was taken in the design of this study to reduce the tendency of study participants to report behaviors that they thought were more socially desirable. These efforts centered on study participant anonymity. It was anticipated that the participants would be more likely to report their behaviors truthfully if they were assured that their responses would remain anonymous.

Summary

This cross-service epidemiologic and behavioral risk factor study of recent HIV seroconverters is the most comprehensive research of its kind to date. It provides essential

information toward a greater understanding of HIV infection in the U.S. military by elucidating the key risk behaviors of this population. It utilized defined seroconversion windows, allowing quantification of risk behaviors during the critical incident time period, and it collected data from four military branches at a number of different sites. This research has illuminated both important cohort-specific HIV risk factors and potential targets for intervention.

RV117 participants reported sexual behaviors that are consistent with other HIV risk-factor studies, including poor partner selection and minimal to nonexistent condom use. More than 65% of the participants reported having sex on the first encounter, and more than 20% reported having sex with someone they think had HIV. These data highlight a very real need for more effective safe sex messages to be implemented both stateside and abroad. This is especially critical for personnel who are having sex with potentially HIV-infected individuals.

The high rate of STDs seen in this study, nearly twice the rate seen in the 1998 DoD Survey, leads us to believe that clinician referral of STD patients to an intensive HIV education program could potentially limit HIV acquisition in the military. Study results also reflected the high rates of alcohol abuse in this population. Moderate/heavy or heavy levels of drinking were reported by 54-69% of the participants, by service, and engaging in sex while under the influence of alcohol was reported by 55-63% of Navy, Marine, Army, and Air Force participants. In the 1995 Levin et al. study of Army HIV seroconverters,[22] researchers found that 43% of subjects reported drinking ≥31 drinks per month. While this is not directly comparable to our findings because of differences in the categorization of alcohol use, both studies do show elevated alcohol use in comparison with the 1998 general DoD population findings. Since elevated rates of alcohol abuse have been found among HIV seroconverters in military service, an efficient and effective use of resources may be to combine training for these two areas of risk behavior. [23, 24]

Another area of great interest and potential success is in the diagnosis and treatment of ARS. Consistent with current data, 58-69% of the study participants reported having seroconversion symptoms and of those, 75% sought medical care. A heightened awareness about ARS has many positive patient and public health consequences. Unfortunately there are many obstacles to successful diagnosis. First, physicians may not consider the possibility of patients with incident HIV infection presenting with these symptoms. Second, ARS diagnosis is further complicated by its similarity to the flu and other mononucleosis-like syndromes. Third and finally, it requires the physician to broach sensitive topics. Therefore, future physician training should be directed at not only increasing ARS awareness, but at teaching skills to overcome potential reticence about discussing HIV risk behavior with their patients.

The data from this study highlight both the similarities and the differences in demographics and risk behavior between the services. It is unclear whether those differences reflect distinct risks within these populations or if they are due to the intrinsically unique composition and culture of the individual service branches themselves. Additional studies investigating the relationship between these military-specific intricacies and HIV risk are necessary for future success in combating the spread of HIV in the military.

However, even in light of the limitations of this study, important groups to target with intensive HIV intervention prevention have been identified. Of note, most of the HIV acquisition found in this population occurred while personnel were in the United States. Increased condom promotion efforts should be directed toward those U.S.-bound, not just those on deployment. Condom use is an effective strategy in preventing HIV infection, so increasing their availability and promoting their use should be aggressively pursued. Personnel who come in for STD screening and treatment are at high risk for HIV infection as are those who are identified as

being heavy alcohol users. Targeting these groups of military persons may help reduce the incidence of new HIV infections.

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Code#_____

Date: _____/_____/00

HIV PREVENTION RESEARCH

CONFIDENTIAL

Please read: Introduction

◆CONFIDENTIAL QUESTIONNAIRE:

This survey will not have your name or social security number (SSN) on it.

❖ Instead, this questionnaire (and the lab specimens) will be given a pre-coded number. Answers will not be analyzed for each survey; but collected as a group.

❖ Some of these questions are very personal. The answers on this questionnaire will be held in strict confidence. It is important that researchers gather accurate and honest information in order to determine where to focus prevention efforts. If there is anything which you don't understand, please be sure to ask. You have the right NOT to answer a question. It is better NOT to answer a question than to make something up. However, we encourage you to answer all the questions.

❖ We have gone to great lengths to ensure *confidentiality*.
Once a week a non-military, medical researcher will collect these envelopes and take them to another center for data entry. Questionnaires will be stored there in ***locked filing cabinets, without identifiers, (with only the code #)*** After you fill out the survey, ***please seal the envelope yourself and put it in the mail slot of the locked cabinet***.

1. Age_____ yrs.

2. Birth YEAR _____
year

3. Gender
☐ Male ☐ Female

4. Birthplace:

☐ USA
city_____ state_____
☐ Mexico ☐ Asia
☐ Europe ☐ Pacific Islands
☐ Middle East
☐ Cent/So. America
☐Other (Specify)_____

5. Race/Ethnicity
☐ African American
☐ White, non-Hispanic
☐ American Indian, Alaskan Native
☐ Filipino ☐ Hispanic
☐ Other ☐ Unknown

6. Marital Status
☐ single (never married)
☐ married ***,living together***
☐ married ***,living apart***
☐ divorced
☐ separated
☐ widow (er)

7. What is the highest level of education you have completed?
☐ Did not graduate high school
☐ High school grad. (or equival.)
☐ College courses
☐ Associate degree
☐Bachelors degree
☐ Post-graduate work
☐ Post-graduate degree
☐ Other _____

8. Where did you live immediately before joining the service?

_____
city state country

9. Currently, what is your military status?
(Check ✓ONE)
☐ Active Duty
☐ Reserve
☐ Retired

Continued☞☞☞☞☞☞☞

Please **check** _ ***or enter a number (partner column only)*** in the boxes.
This question (chart) is about the time between your ***last negative test*** *for HIV and* ***first positive test****.*

10. During the time **BETWEEN** the **LAST** negative test & **FIRST** positive ⊕ test:
Please **list** : **a) your LOCATION, b) the DATES, c) number of SEXUAL PARTNERS and d) CONDOM USE.**

History of Sexual contacts		**Status**				**# Number of Sex Partners**				**Condom Use**		
Sexual contacts:		TAD = **TAD/TDY**				Male = # number of **Males**				Always = **A**		
		Annual Leave= **AL**				Female = # number **of Females**				Sometimes = **S**		
		Deployed/Liberty = **LIB**				Prostitute male # number of **Pm** Prostitute female= # number of **Pf**				Never = **N**		
		Other (off duty,etc) = **Other**										
DATE Mo/yr	**PLACE/Location** city/state/country	**TAD /TDY**	**AL**	**LIB**	**Other**	**#M** number	**#F** number	**#Pm** number	**#Pf** number	**A**	**S**	**N**

10a) Did you go to a <u>foreign land (s)?</u> (either on-duty OR off-duty)

during the time ***<u>between</u>*** *your* ***<u>last negative(-)</u>*** test and ***<u>first (+) positive</u>*** ***test?*** **Yes No**

<u>IF YES:</u>	**<u>WHERE?</u>**	**<u>SEX CONTACT ?</u>** (sex contact is oral, anal, vaginal sex)
	country (US, Mexico, Japan, etc.) city/state	**Yes No**
	country city/state	**Yes No**
	country city/state	**Yes No**
	country city/state	**Yes No**

MEDICAL History/Lifestyle

During the **<u>TIME BETWEEN</u>** the **<u>LAST</u>** negative test & **<u>FIRST</u>** positive ⊕ test:
Please keep in mind we only want to know about a certain **<u>"period of time"</u>** for each person. The **<u>"period of time"</u>** will be **<u>different</u> for each person depending on the *<u>date of their last negative test.</u>*** **This includes** any test result you may have received from a clinic or hospital **<u>outside a military facility and home testing kits</u>.**

11. Date of **<u>1st POSITIVE</u> HIV test** ⊕ _____
(Tested inside or outside a military facility) **Month / Year**

12. Date of **<u>last NEGATIVE</u> HIV test** – _____
(Tested inside or outside a military facility) **Month / Year**

13. <u>WHERE</u> did you have the tests ? (**PLEASE** _ the one<u>s</u> that apply)

- ☐ at a Military facility
- ☐ at an outside/civilian clinic or hospital
- ☐ used a "home testing kit" (from a store)
- ☐ Other (specify)_____

14. In the TIME BETWEEN the **LAST** negative __ test & **FIRST** positive ⊕ test:

Did you have any illness such as: (**PLEASE** _ the ones that apply)

- ☐ **fever**
- ☐ **rash**
- ☐ **sore throat**
- ☐ **joint pains**
- ☐ **headache**
- ☐ **hepatitis**
- ☐ **NO, I did not have any of these illness** ***(go to question 15!)***

➘ ***14. a)*** ☞☞☞☞☞ **IF YES:** ✍ **When ?** (approximately) _____

Month / Year

	Yes	**No**
14 b) Did you seek medical care ?	☐	☐

14 c) Did the illness stop you from participating in:

(PLEASE _ the ones that apply)

- ☐ going to your job
- ☐ exercise
- ☐ social activities (e.g. party, club etc)
- ☐ **did not** stop me from participating in the above activities

15. Have you **had an HIV test** through a *military medical facility* **because you requested a test** ?

Yes	**No**	
☐	☐	***IF "No" go to question16.***

☞ **15 a) IF YES: How many times did *you ask for and receive* a test for HIV?**

- ☐ 1-2 times
- ☐ 3-5 times
- ☐ more than > 5 times

☞☞ **15 b)IF YES: What were your reasons for requesting an HIV test?**

- ☐ I have an HIV + positive partner
- ☐ practiced unsafe sex
- ☐ **Other:** _____

16. Have you had yourself tested for HIV **outside the military** ?
(ie. at a **civilian clinic**, by a **non-military** doctor or nurse, **OR** with a **home testing kit**) ?
☐ **Yes** ☐ **No** *IF "No" go to question 17*

☞ **16 a) IF YES: Have you had more than 1 test outside the military?**
☐ **Yes**
☐ **No**

17. In the TIME BETWEEN the **LAST** negative test & **FIRST** positive ⊕ test:

	Yes	No	
Did you have **an ear (or other body part) pierced?**	☐	☐	*IF "No" go to question 18*

☞ **17 a) IF YES,**
When _____ *(month/yr)*

Where _____
(city/district/country)
What body part ?_____

18. In the TIME BETWEEN the **LAST** negative test & **FIRST** positive ⊕ test:

	Yes	No	
Did you get **a tattoo?**	☐	☐	*IF "No" go to question 19*

☞ *18 a)* **IF YES,** *When* _____*(month/yr)*

Where _____
(city/district/country)

19. In the TIME BETWEEN the **LAST** negative test & **FIRST** positive ⊕ test:

Did you have an *accidental needle stick injury* while working in a laboratory, hospital or other medical setting? **Yes** ☐ **No** ☐ **Don't know** ☐

☞ ***19 a)*** **IF YES,** ***When*** _____
(month/yr)

Where _____
(city/district/country)

☞ ***19 b) Was it, "documented"(i.e.Did a doctor OR nurse see you OR make a note of it) ?***

YES ☐ **NO** ☐

20. In the TIME BETWEEN the **LAST** negative test & **FIRST** positive ⊕ test:

	Yes	No	Don't Know
Did you receive a ***blood transfusion or blood products*** ?	☐	☐	☐

IF "No" go to question 21

☞ ***20 a)*** **IF YES,** *When* _____*(month/yr)*

Where _____*(city/district /country)*

21. In the TIME BETWEEN the **LAST** negative test & **FIRST** positive ⊕ test:

	Yes	No	Don't Know
Did you donate **blood or blood products** ***outside this country*** ?	☐	☐	☐

☞ ***21 a)*** **IF YES,**

When _____*(month/yr)* ***IF "No" go to question 22***

Where _____*(city/district/country)*

22. Please answer the following questions about the: **TIME BETWEEN** the **LAST** negative test & **FIRST** positive ⊕ test. **Keep in mind** we only want to know about a certain **"period of time"** for each person. The **"period of time"** will be **different for each person depending on the *date of their last negative & first positive test.***

☞ **PLEASE REMEMBER TO INCLUDE: any test result** you may have received from a clinic or hospital **outside a military facility and home testing kits.**

Please check one box in each column. **ILLNESS**	*1. Have you ever had... ?* Yes	No	don't know	*2. In the time between your last HIV negative test. And first HIV positive test....?* Did you have the following:..? Yes	No	don't know
Bladder Infection (s)	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Gonorrhea	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
NGU Nongonococcal Urethritis	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Genital Warts (HPV)	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Anal Warts	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Hepatitis B	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Chlamydia	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Syphilis	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Genital Herpes	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Rectal Herpes	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐
Pubic Lice/Crabs	Yes ☐	No ☐	don't know ☐	Yes ☐	No ☐	don't know ☐

ALCOHOL (and other drugs), SECTION

23. **In the time BETWEEN your last negative HIV test and your first positive HIV test:**
Approximately, how many days per week did you drink alcoholic beverages, such as beer, wine, or liquor ?

- ☐ ***0, I did not have any alcohol during that time.***
- ☐ **1 day**
- ☐ **2 days**
- ☐ **3 days**
- ☐ **4 days**
- ☐ **5 days**
- ☐ **6 days**
- ☐ **7 days**
- ☐ ***less than 1 day / a week***

24. **In the time BETWEEN your last negative HIV test and your first positive HIV test:**
On the days that you drank alcoholic beverages,
Typically, how many drinks, (bottles/cans of beer) did you have on **a day**. ?

- ☐ **0, *I did not have any alcohol during that time.***
- ☐ **1 drink**
- ☐ **2 drinks**
- ☐ **3 drinks**
- ☐ **4 drinks**
- ☐ **5 drinks**
- ☐ **6 drinks**
- ☐ **7 drinks**
- ☐ **8 drinks**
- ☐ **9 drinks**
- ☐ **10 drinks**
- ☐ **11 drinks**
- ☐ **12 drinks**
- ☐ **more than 12 drinks**

25. **In the time BETWEEN your last negative HIV test and your first positive HIV test:**
On the days that you drank alcoholic beverages, (beer, wine, liquor)
What was the ***most number of drinks*** you had ***during one day***. ?

#_____(most number of drinks during one day)

26. In the time BETWEEN your last negative HIV test and your first positive HIV test:
How many times did you have sexual intercourse while under the influence of alcohol (feeling buzzed, getting wasted, being drunk)?

☐ **0**
☐ **1-2 times**
☐ **3-5 times**
☐ **6-9 times**
☐ **10 or more times**

27. In the time BETWEEN your last negative HIV test and your first positive HIV test:
Was there a time when you ***"slipped" and did not use a condom*** because you were under the influence of alcohol ?

☐ **YES**
☐ **NO**

☞ **27 a) IF YES: How many times ?**

☐ **1 time**
☐ **2 times**
☐ **3-5 times**
☐ **6 or more times**

28. Have you ever been referred by your command (or medical), for alcohol screening?

☐ **YES**
☐ **NO**

29. Have you ever participated in a program for problem drinking or alcoholism?

☐ **Yes**
☐ **No**

30. Have you ever *been cited* for:

	YES	NO
a) being drunk in public ?	☐	☐
b) having an open container ?	☐	☐
c) driving **under the influence of alcohol**?	☐	☐
d) driving **while intoxicated** ?	☐	☐

31. Have you ever: drank until you "blacked out", **OR** you didn't remember what happened?

☐ **Yes**
☐ **No**

32. **Have you ever:** been to an (Alcoholics Anonymous) AA meeting ?

☐ **Yes**

☐ **No**

Other Drugs:

33. During the **TIME BETWEEN** the **LAST** negative test & **FIRST** positive ⊕ test:

Did you try any of the following recreational drugs: ?

	YES	NO
a. Marijuana	☐	☐
b. Cocaine ("coke")	☐	☐
c. Amphetamines ("crystal meth" "tweek", "uppers","speed", "crack")	☐	☐
d. Barbiturates ("downers")	☐	☐
e. LSD ("acid")	☐	☐
f. PCP ("angel dust")	☐	☐
g. Nitrate inhalants ("amyl nitrate"," butyl nitrate" ,"poppers")	☐	☐
h. Used a *needle* to inject drugs in a vein, (IV Drug Use)	☐	☐

i. Other Drugs ? _____

j. Between the time of your LAST negative test & FIRST positive test:

Did you *use a needle to inject* ***steroids or any other drug*** ?

☐ **YES**

☐ **NO**

SEX History Questions: ***For the purposes of this section "having sex" means oral ,anal or vaginal intercourse.***

34. **How old** were you when you had sexual intercourse for the first time?

_____**years**

35. Is your spouse currently living with you ?

- ☐ **Yes**
- ☐ **No**
- ☐ **I don't have a spouse**

36. Is your current sexual partner HIV + **positive** ?

- ☐ **Yes**
- ☐ **No**
- ☐ **I Don't know**
- ☐ **I don't have a spouse or partner**

37. *Currently*, do you have ***more than one*** *sex partner ?*

- ☐ **Yes**
- ☐ **No**
- ☐ **I don't have a spouse or partner**

38. Do you *prefer to have sex strictly with* men, with women, or both men and women?

- ☐ **Men**
- ☐ **Women**
- ☐ **Both men and women**

39. ***Approximately,*** How many *sexual partners* have you *ever* had ? (lifetime)

#_____**(approximate number of lifetime partners)**

40. <u>Between the time</u> of your LAST negative test & FIRST positive test:

DID you know anyone who was homosexual, lesbian or bisexual ?

(Please check ✓one)

☐ **Yes**

☐ **No**

☐ **Don't Know for sure**

☞ ***40 a)*** **IF YES, *Of these individuals*,** would you describe your relationship with ***any of these persons as:***

	YES	NO
<u>Casual</u> **(e.g. hand shaking or speaking to)**	☐	☐
<u>Moderate</u> **(e.g. family type affection such as hugging)**	☐	☐
<u>Close</u> **(e.g. you had sex with, or you had some type of body fluid exposure)**	☐	☐

41. <u>Between the time</u> of your LAST negative test & FIRST positive test:

DID you know anyone who ***tested positive for the AIDS virus (HIV test)?***

☐ **Yes** ***(Please check ✓one)***

☐ **No**

☐ **Don't Know for sure**

☞ ***41 a)*** **<u>IF YES</u>: *Of these individuals*,** would you describe your relationship with ***any of these individuals as:***

	YES	NO
<u>Casual</u> **(e.g. hand shaking or speaking to)**	☐	☐
<u>Moderate</u> **(e.g. family type affection such as hugging)**	☐	☐
<u>Close</u> **(e.g. you had sex with, or you had some type of body fluid exposure)**	☐	☐

42. Between the time of your LAST negative test & FIRST positive test:
DID you know anyone ***who had used IV drugs***
(used a needle to inject drugs in a vein) ?
(Please check ✓one)
☐ **Yes**
☐ **No**
☐ **Don't Know for sure**

☞ *42 a)* **IF YES,**
Of these individuals, would you describe your relationship with ***any of these individuals as:***

	YES	NO
Casual **(e.g. hand shaking or speaking to)**	☐	☐
Moderate **(e.g. family type affection such as hugging)**	**YES** ☐	**NO** ☐
Close **(e.g. you had sex with, or you had some type of body fluid exposure)**	**YES** ☐	**NO** ☐

43. Between the time of your LAST negative test & FIRST positive test:
Approximately: How many women did you have sex with? #_____

☞ **IF SO, OF THESE WOMEN:**
43a) ***How many*** **were steady** sexual contacts; that is: *5 or more* encounters with ?
_____(approximate number of steady partners)

43b) ***How many*** had sex with you on the **first day** that you met them ?
_____(approximate number, sex on first date)

43c) ***Approximately: How many*** of them were **prostitutes**? #_____

43d) ***Approximately: How many*** were **HIV +positive**, that you know of:
☐ **0**
☐ **1-2**
☐ **3-5**
☐ **6 or more**
☐ **Don't know**

44. Between the time of your LAST negative test & FIRST positive test:

Approximately: How many males did you have sex with ? #_____

☞ **IF SO, OF THESE MALES:**

44a) How many were steady sexual contacts; that is, *5 or more* encounters with ?

_____*(approximate number steady partners)*

44b) How many had sex with you on the *first day* that you met them ?

_____*(approximate number, sex on first day)*

44c) How many of them were *prostitutes* ?

#_____ *(approximate number of prostitutes)*

44d) How many were **HIV +positive**, that you know of: ?

- ☐ **0**
- ☐ **1-2**
- ☐ **3-5**
- ☐ **6 or more**
- ☐ **Don't know**

45. In General, ***Where did you meet your* female *partners ?***
(Please check ✓one or more of the answers below)

- ☐ picked up on the street
- ☐ picked up in a bar or club
- ☐ met at a party or social gathering
- ☐ at a house/place of prostitution
- ☐ at a bath house
- ☐ in an X-Rated bookstore or movie house
- ☐ at work
- ☐ from on-line services (i.e., Internet)
- ☐ I did **not** have female partners
- ☐ Other (specify)_____

46. In General, ***Where did you meet your*** **male** ***partners ?***
(Please check ✓one or more of the answers below)

- ☐ picked up on the street
- ☐ picked up in a bar or club
- ☐ met at a party or social gathering
- ☐ at a house/place of prostitution
- ☐ at a bath house
- ☐ in an X-Rated bookstore or movie house
- ☐ at work
- ☐ from on-line services (i.e., Internet)
- ☐ I did **not** have male partners.
- ☐ Other (specify)_____

47. Between the time of your LAST negative test & FIRST positive test:
Did you have sexual intercourse with someone who
might have been infected with the AIDS virus?

- ☐ **Yes**
- ☐ **No**
- ☐ **Don't Know**

48. Between the time of your LAST negative test & FIRST positive test:
Did you have **vaginal** intercourse?

- ☐ **Yes**
- ☐ **No**

☛ ***48 a)*** **IF YES**: Did you use a condom?

- ☐ Never
- ☐ Sometimes
- ☐ Always
- ☐ Don't know
- ☐ I haven't had vaginal intercourse

49. Between the time of your LAST negative test & FIRST positive test:
Did you have **anal** intercourse?

- ☐ **Yes**
- ☐ **No**

☛ ***49 a)*** **IF YES**: Did you use a **condom**?

- ☐ Never
- ☐ Sometimes
- ☐ Always
- ☐ Don't know
- ☐ I haven't had anal intercourse

50. Between the time of your LAST negative test & FIRST positive test:
Did you have **oral receptive sex, (BJ, "blowjob")** ?

☐ **Yes**
☐ **No**

☞ *50 a)* **IF YES**: Did you use a **condom**?

☐ Never
☐ Sometimes
☐ Always
☐ Don't know

51. Between the time of your LAST negative test & FIRST positive test:
Did any of your sexual **encounters: Cause *your partner* to bleed ?**

Yes	**No**	**Don't Know**
☐	☐	☐

☞ *51 a)* **IF YES How many times ?**

☐ **0**
☐ **1-2**
☐ **3-5**
☐ **more than > 5**
☐ **Don't know**

☞ *51 b)* **IF YES What kind of sex ?**

☐ oral sex
☐ vaginal sex
☐ anal sex

52. Between the time of your LAST negative test & FIRST positive test:
Did any of your sexual **encounters: Cause *you to bleed* ?**

Yes	**No**
☐	☐

☞ *52 a)* **IF YES: How many times ?**

☐ **0**
☐ **1-2**
☐ **3-5**
☐ **more than > 5**

☞ *52 b)* **IF YES: What kind of sex ?**

☐ oral sex
☐ vaginal sex
☐ anal sex

53. Were any of your female, sexual partners "having their period" (menstruating) when you had sex ?

Yes	No	No female partners
☐	☐	☐

☞ *53a)* **If yes: How many times ?**

- ☐ **0**
- ☐ **1-2**
- ☐ **3-5**
- ☐ **more than > 5**

54. Between the time of your LAST negative test & FIRST positive test:
Did you engage in *group sex* ?
---that is, sex with *more than one person* at the same time?

Yes	No
☐	☐

54a). Between the time of your LAST negative test & FIRST positive test:
did you have **sex (oral, anal, vaginal)** with someone who was **BORN in a foreign country ?**

- ☐ **Yes**
- ☐ **No**
- ☐ **I Don't know**

55. ***Who*** do you think infected you with HIV ?
(Check *one* answer that *best* applies)

- ☐ Spouse
- ☐ Partner
- ☐ Friend
- ☐ Casual Acquaintance
- ☐ Prostitute
- ☐ Somebody I met anonymously (in a park, bathhouse, club, etc)
- ☐ Other (specify)_____
- ☐ Don't Know

56. Do you think you were infected with HIV from someone in the military ?

- ☐ Yes
- ☐ No
- ☐ Don't know if they were military personnel
- ☐ Don't know who infected me

57. ***Where*** do you think you acquired HIV infection? ***(Check answers that apply)***

- ☐ At my home/apartment
- ☐ At a *friend's* home/apartment
- ☐ Motel/Hotel
- ☐ In a bath house
- ☐ In house of prostitution
- ☐ In a park
- ☐ In a car
- ☐ Barracks
- ☐ In a social club
- ☐ Don't know **or:**☐ Other*(location):*_____

58. ***At the time you acquired HIV,*** what was your military status?

- ☐ Leave *(where? city, state, country)*_____
- ☐ TAD/TDY *(where? city, state, country)*_____
- ☐ While on deployment *(where? please name country)*_____
- ☐ While on permanent assignment *(where?,city, state country)*_____
- ☐ Other *(location):*_____
- ☐ Don't Know

59. What were the ***circumstances of the situation*** that put you at risk?

(Check the answers that apply)

- ☐ I was drunk, on beer, wine, other alcohol
- ☐ I was high on drugs
- ☐ I didn't think it would happen to me.
- ☐ My friends/peers encouraged me
- ☐ I was angry
- ☐ I was depressed
- ☐ I wanted to get HIV infection.
- ☐ I don't know
- ☐ Other (please specify)_____

60. Do you have any additional comments about the situation or factors that put you at risk for acquiring HIV infection ?

_____

_____

_____

_____

If you need more space, please continue on the back of this page. Thank you.

Occupational History

Answer these questions about the time between your last negative test and first positive test for HIV.

Please keep in mind we **only** want to know about a certain **"period of time"** for each person.

The **"period of time"** will be **different for each person depending on the *date of their LAST negative test and the date of the FIRST positive test.***

61. During the time *between your last negative test and first positive test.: What was your military status?*

(Check ✓ONE)
- ☐ **Active Duty**
- ☐ **Reserve**
- ☐ **Retired**

62. During the time *between your last negative test and first positive test.:* *What was your* Rate/Rank?

Enlisted (E)	Officer (O)
☐ E-1	☐ O-1
☐ E-2	☐ O-2
☐ E-3	☐ O-3
☐ E-4	☐ O-4
☐ E-5	☐ O-5
☐ E-6	☐ O-6
☐ E-7	☐ O-7
☐ E-8	☐ O-8
☐ E-9	☐ O-9

62a). **AFSC/ Rating/MOS**_____

63. During the time *between your last negative test and first positive test.: Approximately, how long* had you been in the service?

Approximately _____
months/years

64. During the time *between your last* last negative test & first positive test: What unit (s) were you in ?
(Please include, year, unit name, location)

date (year)	unit name	location

65. Did you receive any education / information about STDs ***during military service within the past 3 years?***

☐ **YES** ☐ **NO** ☐ **Don't know**

Please continue on the next page☛☛☛

Comments About this Survey

Before we give this survey to a large number of military persons, we need to know if there is anything that should be changed to make it easier to fill out. Your answers to the following questions will help us improve the quality of information we can collect about the issues addressed in this survey.

*** Did you answer Question #10 ("the chart about sexual contacts") on page J-5 ?**

a) ☐ **Yes**
b) ☐ **No**

If not, why?

_____

_____

_____

_____

_____

_____

_____

_____

Thank you for your participation.

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6. AUTHORS Ann Thomas, Stephanie Brodine, Monica Starkey, Stan Ito, Sabrina Seib, Kevin Kelley, Sybil Tasker, Anthony Barile, Kevin Stephan, Naomi Aronson, Cindy Tamminga, Wesley Emmons, Susan Fraser, Mark Wallace, Duane Hospenthal, & Richard Shaffer

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14. ABSTRACT (maximum 200 words)

Background: U.S. military personnel face HIV infection risks both at home and while in foreign lands. It is of paramount importance to quantify and understand the multi-faceted risk factors for HIV infection in this population in order to develop effective interventions. Mandatory, periodic HIV testing of U.S. military personnel has led to a uniquely well-characterized cohort of HIV-seropositive persons. This study capitalized on having a known seroconversion window, and it assessed HIV infection risks during that time period.

Methods: Participants were recruited while in designated HIV/infectious disease units at military catchment facilities. Study subjects completed a survey assessing demographics, sexual health and behavior, and alcohol and drug use.

Results: This study describes the largest cohort of HIV seroconverters to date: 588 military personnel across 4 services. Many participants reported risky sexual behaviors: Air Force, 74% sex on the first date; Navy, 20% sex with commercial sex worker; Marines, 31% sex with HIV-positive partner; and Army, 26% reported having a sexually transmitted disease during the seroconversion window. In addition, most participants reported moderate/heavy or heavy alcohol use.

Conclusions: Unsafe sexual and substance abuse behaviors were found to be risk factors for HIV infection in military personnel, with substantial service-specific variations.

15. SUBJECT TERMS
HIV risk factor data;Navy, Marine, Army, and Air Force personnel; AIDS/HIVseropositive personnel

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