Human Immunodeficiency Virus Seropositivity among Members of the Active Duty US Army 1985-89

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Abstract: Between October 1985 and June 1989, most active duty US Army soldiers were screened for human immunodeficiency virus (HIV) antibody. Of 648,032 screened soldiers in this analysis, 1,588 were HIV-antibody positive. In a multivariate analysis, correlates of positivity included: *age* [Adjusted Odds Ratios (ref <20 years) = 20–24 years, 3.7; 25–29, 9.3; 30–34, 15.7; ≥35, 15.9]; *being male,* [4.2]; *being Black or Hispanic (vs white)* [3.7 and 3.0, respectively]; *being single (vs married)* [3.8]; *assignment to an HIV endemic location* [1.7], and *having a medical occupation* [2.7, 2.7, and 2.6 for negligible, low, and high blood exposure professions, respectively]. Seropositivity rate ratios for medical vs non-medical personnel were 0.7 [95% CI = 0.4, 1.4] for females and 2.9 [95% CI = 2.5, 3.3] for males. For male medical personnel, being single (vs married) correlated strongly with antibody positivity [prevalence ratio = 3.4, 95% CI = 2.6, 4.6]. Excess HIV risk among medical personnel appeared largely attributable to factors other than occupational exposures. (*Am J Public Health* 1990; 80:405–410.)

Introduction

Effective programs to prevent the spread of human immunodeficiency virus (HIV) infection in the general population require the identification of target populations for intense health education and voluntary test-linked counseling.[1-4] Although much is known about the epidemiology of the acquired immunodeficiency syndrome (AIDS), the end stage of HIV infection, the value of this information for educational purposes is limited by the fact that AIDS cases generally reflect transmission risk factors that were operating years ago.[5,6] Prevention programs must reflect HIV infection-transmission patterns operating today and those likely to emerge in the near future. Prevalence and incidence surveys of generally healthy populations can help identify populations for targeted HIV prevention education.

Except for the national blood-donor screening programs, military HIV screening programs currently provide the only HIV seroprevalence data on large cross sections of the US population. Several papers have previously summarized the demographic risk factors for military recruit applicants, a group largely between the ages of 17 and 24.[7-9] In that population, the cumulative seroprevalence is 1.4/1,000 although over time the monthly rates have progressively dropped to below 1.0/1,000, a phenomenon that probably reflects self-deferral of potential applicants who either know from other sources or suspect that they are seropositive. Among recruit applicants, seropositivity is several-fold higher in Blacks, Hispanics, and males. Similar findings have been noted for members of the US Army Reserve Components.[10]

This paper, the largest detailed summary of military HIV demography published to date, expands on the recruit applicant data by focusing on active duty soldiers, a somewhat older group of persons who are more likely to be married and to have had substantial employment experience.

Methods

Population

On October 24, 1985 the Secretary of Defense directed that all 2.1 million active-duty US service members undergo mandatory HIV education and antibody screening.[11,12] This objective was addressed through a variety of programs that included mass screening of military units, screening prior to overseas deployment, blood donor testing, sexually transmitted disease (STD) clinic patient screening, case-contact tracing, and testing for clinical reasons. In 1988, the unit screening program was largely replaced by a birth month screening program designed to ensure that each soldier is tested at least once every 24 months.

HIV Testing

Sera collected as part of the mass screening program were tested with a licensed whole-virus lysate enzyme-linked immunosorbent assay (ELISA). This work was largely done at either a central civilian contract laboratory (Damon Laboratories, Irving, TX) for soldiers assigned to the continental US, Alaska, or Panama; at the 10th Medical Laboratory, Landstuhl, Germany for soldiers stationed in Europe; or at Tripler Army Medical Center for soldiers in Hawaii and the Far East. Positive samples were immediately retested in duplicate with the ELISA.[13] Repeatedly positive samples from all screening laboratories were tested for reactivity with HIV proteins by the Western (immune) blot method by the civilian contract laboratory.[14] From October 1985 until May 1987, specimens were classified as positive if antibodies to HIV-encoded protein GP41 and/or protein P24 plus P55 were detected.[15] In May 1987, the Association of State and Territorial Public Health Laboratory Directors criteria for a positive blot were adopted: at least two out of three of the major HIV protein bands P24, GP41, and GP120/160. Soldiers found positive on the initial Western blot had a second specimen drawn for verification purposes. A detailed Army-administered quality-assurance program characterized by monthly on-site laboratory inspections and specific performance criteria (including the successful analysis of both in-house controls and blind and unblinded panels) has been described elsewhere.[15]

Statistical Analysis

Because the Army population is undergoing constant turnover with only HIV-seronegative applicants allowed to enter and because during the period of data collection

HIV-antibody positive soldiers have separated at a significantly faster rate than seronegative soldiers, this analysis, for reasons of clarity and reference, is confined to those soldiers on active duty when the program was just beginning, specifically on June 30, 1986. Laboratory results, social security number, first four letters of the last name, and test date were keyed onto computerized data files and merged with an abstracted copy of the June 30, 1986 active duty Army personnel file as supplied by the Defense Manpower Data Center, Monterey, CA. For soldiers with more than one test result recorded, only their most recent test was retained in the analysis data set. Antibody positivity was considered verified if an individual was reported by a separate clinical reporting system as HIV-infected (96.2 percent of those potentially considered positive were clinically verified as such) although in 22.9 percent of the cases clinical verification was based only on the documentation of an individual having had multiple positive HIV Western blots on separate specimens. Only soldiers verified to be HIV-infected prior to August 3, 1989 are considered HIV-infected for this analysis.

Seropositivity rates were calculated as both centrally screened and overall rates. The centrally screened rate is defined as the number of antibody positive soldiers who were reported as having been screened through the three centralized laboratories listed above divided by the total number of soldiers reported as screened by those laboratories.

Many soldiers found to be antibody positive were initially tested through testing activities conducted outside of the centralized testing laboratories (e.g., blood bank and some STD clinic screening). These individuals often were exempted from subsequent mandatory testing done by the centralized laboratories. The overall rate is based on a numerator that includes all antibody-positive active-duty soldiers who were in the Army on June 30, 1986 divided by the number centrally screened plus the number of positive soldiers not reported from the central laboratories. The centrally screened rate is a significant underestimate of the true rate because only 79 percent of the eligible antibody positive soldiers ever had a centralized screening test result reported. The overall rate is felt to be a modest overestimate because the denominator excludes a small though unquantifiable number of seronegative soldiers who either were tested but did not have a negative test reported or who were not centrally screened but were antibody negative in adjunct screening programs, such as blood bank and clinical screening. Some negative ELISA results from blood bank and clinical screening were not captured for epidemiologic purposes since not all of the adjunct screening was done by one of the three centralized HIV testing laboratories.

Because of centralized Western blot testing, positive blots from all testing programs were captured in an extremely complete fashion. For the most part, only overall rates and measures of effect based on overall rates will be described in the text since the overall rates are felt to best reflect the true rates. In the analyses of prevalence by occupation, broad occupational clusters were defined according to Army regulation, with minor modifications.[16] For the analysis of prevalence among medical personnel, the blood exposure groupings with minor modifications were those of Gardner, et al.[17]

To demonstrate the effect of a possible risk factor, seropositivity rate ratios with 95% confidence intervals were calculated.[18] In bar graphs, 95% CIs are based on the Poisson distribution. The main effects logistic regression analysis was performed with the Stepwise Logistic Regression (PLR) procedure of the BMDP Statistical Software Package (Uni-

versity of California at Los Angeles). All listed variables were forced into the model. Adjusted odds ratios were calculated by using logistic regression parameter estimates.[19] Confidence intervals for odds ratios and estimates of their statistical significance were derived from standard errors of the parameter estimates.[19]

Results

As of July 27, 1989, centrally screened results have been received for 647,700 soldiers out of the 763,675 individuals in the June 30, 1986 active-duty Army personnel file abstract. Demographically, this 84.8 percent sample (Table 1) constituted a representative sample of the whole Army. Three hundred and thirty-two soldiers who were verified as antibody positive but not reported as having been centrally screened were added to the analysis file. Of the 115,643 June 30, 1986 cohort soldiers without a documented HIV test result, 72 percent had separated from the active Army by December 30, 1988; 4 percent were accessions who had screened negative as part of the recruit-applicant screening instituted on October 1, 1985. The 28,863 remaining active-duty soldiers for whom valid test results were unavailable, were demographically similar to those tested based on race but women, married persons, officers and those at the extremes of the age spectrum appeared to be more likely not to have had a test reported.

Overall Seropositivity

The centrally screened seropositivity was 1.9/1,000 based on the 1,256 verified positive soldiers who had been centrally screened. The overall rate based on the 1,588 June 1986 cohort positives was 2.5/1,000. Of the 1,588 cohort soldiers who were verified as HIV antibody positive as of

TABLE 1—Characteristics of the Sample HIV Screened

Characteristic*	Army Population	Proportion of Army	Sample Population	Proportion of Sample
Age (years)		%		%
<20	78,543	10.3	66,430	10.3
20–24	282,792	37.0	234,073	36.1
25–29	169,579	22.2	147,229	22.7
30–34	108,248	14.2	96,530	14.9
≥35	123,665	16.2	102,846	15.9
Race/Ethnicity				
White	502,696	65.8	421,414	65.1
Black	205,192	26.9	177,991	27.5
Hispanic	27,047	3.5	23,635	3.7
Other	28,740	3.8	24,660	3.8
Sex				
Male	684,530	89.6	583,960	90.2
Female	79,093	10.4	63,691	9.8
Marital Status				
Single	313,655	41.1	260,183	40.2
Married	422,044	55.3	364,193	56.2
No Longer Married	27,001	3.5	22,593	3.5
Unknown	975	0.1	731	0.1
Rank				
Enlisted	652,490	85.4	551,974	85.2
Warrant	15,441	2.0	13,535	2.1
Commissioned	95,744	12.5	82,189	12.7
Length of Service (years)				
<1	115,513	15.1	98,209	15.2
1–3	267,969	35.1	219,130	33.8
4–6	110,967	14.5	96,922	15.0
7–9	83,915	11.0	74,232	11.5
≥10	185,311	24.3	159,161	24.6

*As recorded in June 30, 1986 military personnel file.

August 3, 1989 the reported sources of identification were: 809 (50.9 percent) through unit or birth month screening, 136 (8.6 percent) through clinical evaluations, 112 (7.1 percent) through pre-deployment screening, 101 (6.4 percent) through blood donor screening, 59 (3.7 percent) through STD clinic screening, 48 (3.0 percent) through self-referral, 17 (1.1 percent) through contact tracing, and 306 (19.3 percent) through other or unspecified sources.

Age

Antibody positivity varies significantly with age. For soldiers less than 20 years old at their most recent available test (a group heavily preselected to be negative by recruit-applicant testing), the overall rate was 0.5/1,000. Thereafter, there was a steady progression from an overall rate of 1.8/1,000 in those aged 20–24, to 3.1/1,000 in those 25–29 and to 3.4/1,000 in those 30–34. The rate among soldiers older than 34 drops to 2.2/1,000. A similar pattern was observed in the centrally screened rates.

Race or Ethnic Group

Soldiers who were Black or Hispanic had an overall seropositivity of 5.1/1,000 (900 cases) and 4.0/1,000 (95 cases), respectively. The HIV infection prevalence rate ratios compared to White soldiers were 4.0 [95% CI = 3.6, 4.4] for Blacks and 3.2 [95% CI = 2.5, 3.9] for Hispanics. Across age strata, Whites had a relatively flat prevalence trend; Blacks and Hispanics both showed a rise through the early thirties and then a fall (Figure 1). HIV infection would appear to be unevenly distributed among subsegments of the Hispanic population. The seropositivity rate for Hispanic soldiers with a home of record listed as Puerto Rico, New York, or New Jersey, a group assumed to be largely of Puerto Rican descent, was 5.6/1,000. In contrast, the Hispanic soldiers with a home of record in states along the Mexican border (California, Arizona, New Mexico, Texas) had a rate of 2.2/1,000 (PR = 2.5, 95% CI = 1.5, 4.3).

Sex

There were 1,516 verified positive cohort men, yielding an overall rate of 2.6/1,000. The corresponding female rate, based on 72 positive women, was 1.1/1,000. The crude male:female seropositivity rate ratio was 2.3 [95% CI = 1.8, 2.9]. Male:female overall rate ratios by race/ethnic group were 2.5 for Whites [95% CI = 1.5, 4.0], 3.0 for Blacks [95% CI = 2.3, 4.0], 2.1 for Hispanics [95% CI = 0.7, 6.7], and 3.1 for others (2 female cases). The overall rates in Black and Hispanic females were 1.9/1,000 (49 cases) and 1.9/1,000 (3 cases), respectively. The Black female rate exceeded the

1.3/1,000 overall rate in White males [RR = 1.4, 95% CI = 1.0, 1.9]. Age-specific male:female ratios did not show any definite trend across age strata (Table 2).

Marital Status

Among the 1,588 cases, 639 were married, 878 were single, and 71 were no longer married, indicating that 44.7 percent of the cohort cases are or had been married based on the June 30, 1986 file. Compared to married soldiers, the HIV infection prevalence ratios for single soldiers and for those no longer married were 1.9 [95% CI = 1.7, 2.1] and 1. 8 [95% CI = 1.4, 2.3], respectively. Whereas overall rates were quite similar for married and single soldiers in the youngest age strata, single soldiers over 34 years of age had an overall prevalence rate that was 10.8 times that found in married soldiers in that stratum (Figure 2). Among White and Black soldiers, the rate ratios for single soldiers relative to married soldiers were 2.1 [95% CI = 1.8, 2.5] and 2.1 [95% CI = 1.8, 2.4], respectively. In contrast, the rate ratio for single Hispanic soldiers compared with their married counterparts was 1.1 [95% CI = 0.7, 1.7]. For males the overall single and married rates were 3.7/1,000 (844 cases) and 1.8/1,000 (607 cases), respectively. Among females the single (34 cases) and the married (32 cases) rates were both 1.1/1,000.

To explore the effects of age on estimates based on female marital status, female rates were directly age adjusted using the total male age distribution. The adjusted female rates were 1.2/1,000 for singles and 0.9/1,000 for marrieds.

Rank and Education

Based on 1,447 cases, the overall seropositivity rate for enlisted soldiers was 2.6/1,000. Warrant officers had an overall rate of 0.9/1,000 (12 cases) and commissioned officers an overall rate of 1.6/1,000 (129 cases). Within White, Black, and Hispanic groups, officer to enlisted prevalence ratios did not vary significantly (data available on request to author). Non-college graduates (less than 4 percent of soldiers in this cohort had not completed high school) had an overall rate of 2.6/1,000 (1,400 cases) in contrast to a rate of 1.9/1,000 (183 cases) for college graduates.

Occupational Category

HIV infection is distributed quite unevenly across job clusters (Table 3). Because health care workers had an elevated rate and because the potential for acquisition of infection in the course of performing job-related functions has been documented, several analyses were undertaken to better understand the source of risk for these individuals. Rate ratios comparing prevalence estimates for 42,697 health care providers [72.4% male] and 605,286 non-medical personnel [91.4% male] were 0.7 [95% CI = 0.4, 1.4] for females and 2.9 [95% CI = 2.5, 3.3] for males. For male medical personnel being single [vs married] was a major correlate of
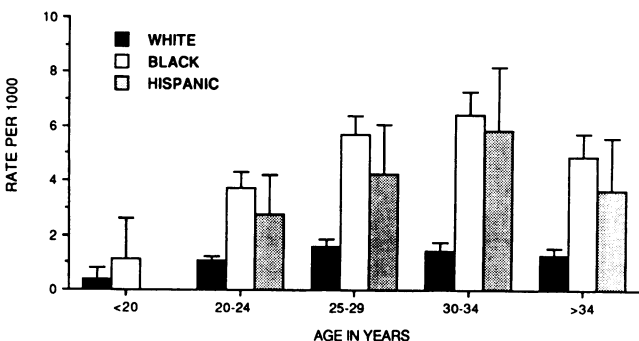

FIGURE 1—Overall HIV Seropositivity Rates and Upper 95% Confidence Interval Bounds for Active Duty US Army Personnel Stratified by Age and Race/Ethnic Group

TABLE 2—US Army HIV Testing Overall Seropositivity Rate Estimates by Age and Sex

Age (years)	Male Rate* (No. Positive)	Female Rate* (No. Positive)	Male:Female Rate Ratio	95% CI
<20	0.4 (8)	0.9 (2)	0.5	0.1–2.2
20–24	1.9 (380)	0.7 (15)	2.8	1.7–4.7
25–29	3.4 (484)	1.2 (25)	2.8	1.9–4.1
30–34	3.5 (352)	2.0 (23)	1.8	1.2–2.7
≥35	2.3 (292)	0.9 (7)	2.6	1.2–5.5

*Rates are per 1000 persons

FIGURE 2—Overall HIV Seropositivity Rates and Upper 95% Confidence Interval Bounds for Active Duty US Army Personnel Stratified by Age and Marital Status

TABLE 3—US Army HIV Seropositivity Rates by Occupational Cluster

	Centrally Screened		Overall	
Job Cluster	Rate*	N Positives	Rate*	N Positives
Military Science	1.4	267	1.6	317
Electronics and Communications	1.9	140	2.6	189
Administration and Arts	3.8	212	4.9	270
Health Science	4.0	215	5.0	269
General Engineering and Science	1.7	36	2.1	44
Aviation	0.5	15	0.8	22
Intelligence/Military Police	1.0	42	1.3	58
Mechanical Maintenance	0.9	53	1.1	68
Missile Maintenance	1.3	11	1.4	12
Transportation, Supply, and Services	2.7	254	3.5	325
Other and Unknown	0.7	11	0.9	14

*Rate are per 1000 persons

positivity [prevalence rates = 3.4, 95% CI = 2.6, 4.6]. Among single medical males over the age of 34, the seropositivity ratio relative to their married counterparts was 15.9 [95% CI = 9.3, 27.3]. Rate ratios for male medical staff with high- and intermediate-level blood exposure relative to male care providers with minimal blood exposure were 0.9 [95% CI = 0.5, 1.5] and 1.1 [95% CI = 0.7, 1.6], respectively.

Multivariate Analysis (Adjusted Odds Ratios)

To control for the simultaneous effect of many mutually confounding factors, a main effects logistic regression model was constructed using the variables in Table 4. To reduce the preselection effect of recruit-applicant screening which started in October 1985, only soldiers with at least 10 months of service as of June 30, 1986 were included in the model. Noteworthy changes in odds ratios brought about by multivariate adjustment included the less obvious decline in risk for the oldest soldiers, the increased risk for men relative to women (adjusted OR = 4.2) and for singles relative to married soldiers (adjusted OR = 3.8). Adjustment significantly brought down the odds ratios associated with increasing length of service. The odds ratios by race/ethnic group, endemicity group, and medical blood exposure category were not significantly changed by the adjustment.

TABLE 4—Main Effects Multiple Logistic Regression Model for HIV Infection in the US Army

Variables	Crude Odds Ratio	Adjusted Odds Ratio	95% Confidence Interval
Age (vs <20)			
20–24	3.5	3.7	1.7–8.4
25–29	5.4	9.3	4.1–21.1
30–34	5.6	15.7	6.9–35.8
≥35	3.7	15.9	6.9–36.6
Sex (vs Female)	2.4	4.2	3.3–5.4
Race/Ethnic Group (vs White)			
Black	3.9	3.7	3.3–4.2
Hispanic	3.1	3.0	2.4–3.7
Others	1.8	1.6	1.2–2.2
Marital Status (vs Married)			
Single	2.3	3.8	3.4–4.4
Was Married	1.8	1.9	1.5–2.4
Endemicity*	1.7	1.7	1.4–1.9
Years of Service (vs <3 yrs.)			
4–6	1.1	0.8	0.7–1.0
7–9	1.4	0.8	0.7–1.0
≥10	0.9	0.6	0.5–0.7
Rank (vs Officer)	2.0	1.7	1.4–2.0
Blood Exposure Level (vs non-health care job)			
Negligible	2.2	2.7	1.8–4.0
Low	2.5	2.7	2.2–3.2
High	1.9	2.6	1.9–3.6

*Based on assignment in California, southern New York State, New Jersey, or the vicinity of the District of Columbia as of June 30, 1986.

Discussion

This analysis summarizes one of the largest population-based HIV antibody surveys undertaken to date. Although the observations are not directly generalizable to the 15 to 50 year old segment of the US general population due to various biases including the presumed underrepresentation of intravenous drug abusers and homosexuals in the military, the above results support the findings of other studies that HIV infection is an important issue for Black and Hispanic communities and for females.[7,20-23] The data appear to reasonably represent the people in the US Army on June 30, 1986. The entry and separation of over 100,000 people from the active component of the US Army each year plus the worldwide mobility of that population did not allow an HIV antibody screen to be completed on all members of the June 30, 1986 cohort.

The prevalence trend by age was similar to that noted for military recruit applicants and notable for a peaking in the late 20s and early 30s before tailing off in the mid-30s.[7] This trend in antibody positivity peaks several years before the peak described for AIDS cases. There are several possible explanations for the HIV antibody age pattern. First, those inclined to engage in risk behaviors may tend to moderate the intensity of their risk behaviors with age. Since the HIV virus has only been endemic in the US for an estimated 10–15 years, older soldiers may have passed through a period of more frequent risk taking before HIV was a significant presence. Second, older soldiers are more likely to be career soldiers than are those in the younger age strata. Soldiers who aspire to a military career and who have successfully adapted to the military environment (as suggested by many years of service) may be less inclined to practice some risk behaviors such as intravenous drug abuse and homsexuality because the practice of these behaviors is contrary to military policy. Since the early 1970s, random urine drug screens have been a regular occurrence in the Army, making even the covert use

of illicit drugs a risk to a soldier's career. After adjusting for marital status, length of military service, and other variables in the multiple logistic regression model, there is a steady increase in risk with age. Most importantly, however, these data suggest that significant risk of HIV infection begins in the late teens/early twenties and continues through the young adult period.

The observation that Black and Hispanic soldiers, even in the multivariate analysis, are at a three-to-four fold increased risk of being infected is consistent with civilian data.[7,20] The significant difference in prevalence trends by age for Blacks and Hispanics in contrast to Whites is again striking. A relatively flat prevalence trend for Whites and a dramatic rise and fall for Blacks and Hispanics may reflect a more rapid recognition of the HIV threat and its consequences on the part of Whites. The 2.5 fold increased risk of positivity for Hispanic soldiers with a home of record documented as Puerto Rico, New York, or New Jersey versus that for Hispanic soldiers with Mexican border state homes is reflective of Selik's finding that AIDS incidence appears to be higher in Hispanics of Puerto Rican descent than among other Hispanics.[24] Unfortunately, data on the risk behaviors directly responsible for the infections are not available to the authors. The observation that 50.4 percent of the 995 largely asymptomatic infected Black and Hispanic soldiers and 44.9 percent of the 536 largely asymptomatic White soldiers had at least seven years of service supports the impression that in the majority of cases the infection was acquired while the soldiers benefited from the economic, occupational, and social stability of a military environment. The fact that risk for both White and Black officers was similar to that of their enlisted counterparts further argues against a major role for current socioeconomic status in this military population.

As with all epidemics, the propagation of this epidemic depends on complex interactions among the agent, environment, and host. In the same way that high HIV prevalences (the agent-endemicity factor) among homosexual men tend to make sex acts (the behavioral-environment factor) more risky than similar acts among heterosexuals in a low HIV prevalence population, so too may risk activities in high prevalence minority populations lead to more infections than they might in lower prevalence communities. Although the data are inconclusive, race/ethnic differences in susceptibility (the host factor) to infection may be contributory factors also.[25-27]

In contrast to the 8:1 male:female AIDS case ratio in the US during the first half of 1989, the HIV infection prevalence ratio in these data is 2.4:1 (adjusted OR = 4.2:1 in multivariate analysis).[28] The prevalence ratio is similar to that reported for military recruit applicants.[7] In teenaged military recruit applicants (J. Brundage, unpublished data) and among people in the African HIV epidemic, the male-to-female ratio approximates 1:1.[21] Male:female prevalence ratios do not differ by race, but it is important to note that in the Army, the rate for Black and Hispanic women is 1.5 times higher than that found in White men, supporting the conclusion that women, particularly of racial/ethnic minorities, need special emphasis in prevention efforts. The marital status information further supports efforts to provide prevention education beyond single homosexual men. Although the marital status data do not allow any statement about the responsible risk activity, it shows that 45 percent of infected Army personnel are or were married. It would be reasonable to assume that most of these people participated in heterosexual sex at least some of

the time and that many otherwise risk-avoiding heterosexuals were contacting the virus. One report of risk factors in a population of 57 US Army HIV-positive soldiers noted that 77 percent were heterosexually active, including 31 soldiers who said they were bisexual.[29] Centers for Disease Control AIDS data indicate that about 26 percent of reported AIDS cases are heterosexuals, although it is clear that most of these heterosexuals did not acquire their infections through sexual activity.[20]

Regarding risk by occupation, data presented here are consistent with other published estimates of the low risk for occupational acquisition of HIV infection in the medical setting.[30,31] The observations that excess risk for those in medical occupations appeared to be confined to males and that prevalence was not correlated with levels of occupational blood exposure are consistent with the conclusion that risk in Army health care personnel is largely due to factors other than occupational exposures. The logistic regression analysis also supports this and a comparable analysis of Army Reserve component data comes to a similar conclusion.[32]

The repeated testing of all active duty soldiers is allowing not only the ascertainment of antibody prevalence but also the current annual incidence of seroconversion. The first of these analyses for the period October 1985 to October 1987 identified 90 seroconvertors for a rate of 0.77 per 1,000 persons per year.[33] Current seroconvertors are carefully studied to ascertain potential shifts in transmission patterns since the design of prevention programs should reflect not only the transmission patterns in effect 10 or more years ago, but also recognize the role of emerging risk groups as the infection continues to spread, although probably more slowly, through initially unemphasized segments of the population.

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NCHS Survey: Characteristics of Persons Dying from Stroke

Cerebrovascular disease—or stroke—is the third leading cause of death in the United States, accounting for almost 150,000 deaths in 1986. The National Center for Health Statistics conducted a special survey based on a sample of such deaths among those 25 years of age and over which occurred in 1986. The survey analyzed the health and other care received in the last year of life and source of payment, health practices and behaviors, health status, and social and economic characteristics of those who died from stroke. These data will be used in disease prevention programs and to plan adequate health and support services for those with cerebrovascular disease. The major findings include:

● Nearly 70 percent of those who died from stroke were over the age of 75. Less than half of the deaths from all other causes occurred to those 75 years of age and over.

● More women than men died from stroke, 60 to 40 percent, respectively. Women were about three times more likely to be widowed at the time of death and only one-third as likely to be currently married.

● Most adults who died in 1986 had seen a physician five times or more in the year prior to death. Persons dying from stroke were more likely to have no physician visits or fewer than five visits; and to have resided in an institution during the year prior to death.

● Medicare was the primary source of payment for health care in the last year of life for most causes of death, including stroke.

● A larger proportion of those dying from stroke than from all other causes were reported to have hypertension.

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