

**SEROPREVALENCE OF HIV, HEPATITIS B, HEPATITIS C  
AND RISK BEHAVIORS AMONG INMATES ENTERING  
THE CALIFORNIA CORRECTIONAL SYSTEM**

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# SEROPREVALENCE OF HIV, HEPATITIS B, HEPATITIS C AND RISK BEHAVIORS AMONG INMATES ENTERING THE CALIFORNIA CORRECTIONAL SYSTEM

## I. EXECUTIVE SUMMARY

**Objectives.** Our objectives were: 1) to estimate the prevalence of human immunodeficiency virus (HIV) infection and markers for hepatitis B virus (HBV) and hepatitis C virus (HCV) among inmates entering six reception centers of the California Department of Corrections, and 2) to assess risk behaviors associated with HIV seropositivity in the study population.

**Design.** A cross-sectional unlinked (blinded) survey was conducted from August 15 to September 9, 1994 among male inmates, and from August 15 to October 7, 1994 among female inmates. Of the 5,279 inmates receiving entrance physical examinations at the six reception centers during the study period, 5,142 had serum tested for the presence of HIV antibody (HIV-Ab), and antibody to HCV (anti-HCV), and 5,144 had serum tested for the presence of HBV core antibody (anti-HBc) and HBV surface antigen (HBsAg). Antibody testing was conducted after routine blood work was completed, and personal identifiers were removed from the serum samples. Serum was not tested for the remaining inmates because no blood was drawn, the quantity was not sufficient, or the specimen was not saved.

**Results.** Of the 5,142 specimens tested for HIV-Ab and anti-HCV, 126 (2.5%) were positive for HIV-Ab and 2,108 (41.0%) were positive for anti-HCV. Of the 5,144 specimens tested for anti-HBc and HBsAg, 1736 (33.7%) were positive for anti-HBc and 112 (2.2%) were positive for HBsAg. Of the eligible specimens for this study, 899 (17.5 %) specimens had risk exposure data. On entrance to the California correctional system, female inmates were more likely to be HIV infected when compared to male inmates (3.2 % and 2.4 % respectively); male inmates were more likely to be infected with current/chronic hepatitis B (2.4 % versus 1.3 %); and female inmates were more likely to be infected with past hepatitis B and hepatitis C (47.9 % and 54.5 % versus 31.9 % and 39.4 % respectively). African American men were twice as likely to be HIV infected compared to White men (OR=1.8; 95% CI, 1.1% to 2.8%).

**Conclusions.** Although the inability to collect information on risk behaviors in this unlinked study limits the interpretation of the data, it provides important information on the current scope of HIV, hepatitis B, and hepatitis C infection in persons entering the California correctional system. A comprehensive approach to eliminating HIV, HBV, and HCV transmission must address teen and adult inmates that are hard to reach, especially those who do not realize they are at risk, through health programs, and risk reduction education. Intervention efforts for the control of HBV and HCV infections among the inmate population should include the use of hepatitis B vaccines and routine anti-HCV screening. Prevention efforts should include high-risk behavior modification, such as safer sexual and needle-using practices, and better access to the health care system.

## II. INTRODUCTION AND BACKGROUND

Approximately 5,100,000 adults (2.7 % of the total U.S. adult population) were under correctional supervision in jails and federal and state institutions in 1994,<sup>1</sup> and the number of adults incarcerated increased 3.9 % during 1994.<sup>1</sup> Among all states, California had the second largest number of adults on probation and parole with 370,000 under such supervision.<sup>1</sup> Considering the size of this population and the demonstrated potential for human immunodeficiency virus (HIV) transmission within prison settings,<sup>2</sup> HIV infection and acquired immunodeficiency syndrome (AIDS) in prisons are major public health concerns.

Transmission of HIV is widely concluded to occur in three ways: 1) through sexual contact, 2) through blood-to-blood (or blood-to-mucous membrane) exposure, and 3) perinatally.<sup>3</sup> Inmates often have a pre-incarceration history of participation in high-risk behaviors, including injection drug use (IDU), needle sharing, and unprotected sex. Furthermore, these HIV risk behaviors, although prohibited, are known to occur in correctional facilities.<sup>4</sup> As a result, both inside and outside the prison setting, this population is at an increased risk of HIV infection compared to the general population. A study of selected jails and state and federal prisons around the nation estimated HIV seroprevalence rates among inmates to be between 2.1 % and 7.6 % for men and between 2.5 % and 14.7 % for women.<sup>5</sup> According to the Centers for Disease Control and Prevention (CDC), the seroprevalence in inmates from 15 state correctional systems and the Federal Bureau of Prisons ranges from 0 to 15% (median 0.4%).<sup>6</sup> The risk factor most often reported in seropositive inmates is a history of intravenous drug abuse. The higher seroprevalence rates among inmates indicate a serious need to plan primary and secondary prevention services for this population.

Approaches to HIV seroprevalence screening and testing among correctional system populations vary markedly among states. The major approaches include mass (or mandatory) screening, risk-group screening, voluntary/request testing, blinded screening for epidemiologic studies, clinical indications or symptoms testing, and testing in response to potential transmission incidents.<sup>7</sup> The primary applications of HIV-Ab testing are early identification and intervention, education, and primary and secondary prevention. Epidemiological studies and mass screening conducted to estimate HIV seroprevalence in correctional institutions throughout the nation are summarized and listed in Appendix 1.

All 50 States, the District of Columbia, and the Federal Bureau of Prisons currently test inmates for HIV on some basis.<sup>8</sup> Fifteen States and the U.S. Bureau of Prisons tested all inmates upon admission or release. Rhode Island and Wyoming tested all inmates currently in custody. New York, New Jersey, the District of Columbia, and the Federal Bureau of Prisons tested random samples.<sup>8</sup>

Many correctional facilities offer voluntary HIV testing and counseling. These facilities' voluntary testing programs are required by law to include pre- and post-test counseling and a means of notification, even in the event of transfer of an inmate to another facility or inmate discharge. However, estimates of HIV seroprevalence based upon voluntary populations cannot accurately

reflect HIV seroprevalence within general prison populations. Approximately 25 % of inmates voluntarily tested for HIV are seropositive. These proportions are high compared with those seroprevalence estimates shown in Appendix 1. A blinded seroprevalence survey can minimize the bias inherent in analyzing a selected or self-selected population and estimate the seroprevalence of HIV in the general prison population.

Hepatitis B virus (HBV) and hepatitis C virus (HCV) share with HIV similar routes of transmission and likewise represent important potential causes of infections in correctional facilities. HBV is transmitted primarily by percutaneous and mucous membrane exposures to infectious body fluids.<sup>9</sup> The most efficient transmission of HCV is associated with percutaneous exposures to blood. The risk of HCV transmission by sexual or household contact, and from infected women to their newborns also seems to occur, but the risks associated with these types of exposures are still unknown.<sup>10</sup>

In the spring of 1988, the California Department of Health Services, Office of AIDS (CDHS/OA), at the request of and in collaboration with the California Department of Corrections, conducted a cross-sectional unlinked (blinded) study to estimate HIV seroprevalence among incoming California prisoners. That study found an HIV seroprevalence rate of 2.55 % among 5,372 men tested and 3.10 % among 807 women tested.<sup>11</sup> In the fall of 1994 CDHS/OA and the California Department of Corrections conducted another cross-sectional unlinked (blinded) study to estimate the extent of HIV infection and of markers for HBV and HCV among male and female inmates entering the California correctional system.

### **III. SAMPLING AND STUDY METHODOLOGY**

The study protocols were approved by California's Health and Welfare Agency Committee for the Protection of Human Subjects.

#### **Study Population**

In California, all incoming prisoners receive a physical examination shortly after arrival at a reception center. During the physical examination a blood sample is obtained and tested for syphilis.

Our study population consisted of all male and female inmates scheduled to have blood drawn in association with physical examinations on entrance to the California correctional system from August 15, 1994 through September 9, 1994 (male inmates) and from August 15, 1994 through October 7, 1994 (female inmates). The study period for female prisoners was extended for an additional 4 weeks because of the low number of incoming female inmates.

#### **Site Selection**

The site of entry into the California correctional system is determined by the county where the crime was committed and the type of crime. The Department of Corrections has 13 reception centers where inmates are processed for entrance into the system. This study included four reception centers where adult males are processed and two reception centers where adult females are processed.

The four male reception centers selected were:

- 1) R.J. Donovan Correctional Facility at San Diego (San Diego County).
- 2) North Kern State Prison at Delano (Kern County).
- 3) San Quentin State Prison at San Quentin (Marin County).
- 4) Wasco Reception Center at Wasco (Kern County).

The two female reception centers selected were:

- 1) California Institution for Women at Frontera (San Bernardino County).
- 2) Central California Women's Facility at Chowchilla (Madera County).

Selection of facilities was made by the California Department of Corrections in collaboration with the CDHS/OA. This selection was based on the following: 1) representativeness of urban and rural areas, 2) high volume of inmates, and 3) regional representation. In addition, the facility had to routinely obtain blood specimens for other purposes from all inmates, without selection based on possible risk for HIV infection.

#### **Sampling Plan**

The sample size of this study was computed using the 1994 prison population census and

HIV prevalence estimates from the 1988 seroprevalence study among prisoners entering the California correctional system. Based on a two-tailed test for proportions, an alpha level of 0.05, a power of 0.80, and an attrition rate of 10 %, the resulting gender specific sample size for this study was 4,350 males and 650 females.

The proportion of the sample selected from each reception center was based on the proportion of inmates processed at the center on a weekly basis. For males, we proposed to collect 880 unlinked blood specimens from North Kern State Prison, 512 unlinked blood specimens from R.J. Donovan Correctional Facility, 1759 unlinked blood specimens from San Quentin State Prison and 1199 unlinked blood specimens from Wasco Reception Center. For females, we proposed to collect 268 unlinked blood specimens from the California Institution for Women and 382 unlinked blood specimens from the Central California Women's Facility.

## **Study Design**

To obtain the least biased seroprevalence estimate of HIV, HBV and HCV in incoming inmates, we conducted a cross-sectional unlinked (blinded) survey. Sera that was collected for other purposes (e.g., syphilis serology) was tested for HIV-Ab, HBsAg, anti-HBc, and anti-HCV after all personal identifiers were removed.

We visited three reception centers to observe intake procedures and to interview staff. During these visits, we evaluated the accessibility of risk behavior information from medical charts and assessed the intake procedure in order to anticipate potential problems in collecting data for all incoming inmates.

Also, we obtained copies of all standardized intake entry forms used by these facilities. After the site visits were conducted and all intake forms were received, we developed a standardized study protocol to be used by the California Department of Corrections staff at all the participating facilities during the study period.

## **Eligibility Criteria**

Sera from incoming male and female inmates were eligible for inclusion in the study if:

- 1) the inmate was in the initial admission process to the correctional facility (whether in detention status, awaiting judgment, or convicted); and
- 2) the inmate had not been incarcerated in the same facility since the initiation of the study.

We also included sera from persons known to be HIV positive if they met the above two eligibility criteria.

## **Data Collection**

Data collection was performed in accordance with California statutes which allow unlinked

(blinded) HIV antibody testing. According to these statutes, sera must be collected for other purposes. Sera can be tested for HIV antibody without written consent from the subject provided that the test results cannot be linked to the individual's name or any other identifying information.

We collected demographic, geographic, and previous incarceration information that was routinely obtained during admission to the correctional facility. We used a standardized data collection form (Correctional Facility Seroprevalence Survey) provided by the CDC (Appendix 2). This form was completed for all eligible inmates who had a blood test ordered, even if sera could not be obtained, to allow comparison of inmates who were not tested to those who were tested for HIV-Ab, HBsAg, anti-HBc, and anti-HCV.

Essential data collected for each eligible specimen included: 1) date (month/year), 2) state of residence of the inmate, 3) county and zip code where the crime was committed, 4) sex, 5) age group, 6) race/ethnicity, 7) risk exposure (available in some correctional facilities), 8) previous incarceration information, 9) Venereal Disease Research Laboratory/Rapid Plasma Reagin (VDRL/RPR) results, and 10) availability of a blood sample. Some correctional facilities collected HIV exposure related information (e.g., homosexual or bisexual activity, intravenous drug use) as part of the admission process. If risk exposure data were obtained during the admission process, this information was collected for each eligible specimen.

## **Laboratory Methods**

All testing was performed at the State Viral and Rickettsial Disease Laboratory in Berkeley. Sera were tested for the presence of HIV-Ab by the Abbott enzyme-linked immunosorbent assay (EIA). Sera that were reactive on the initial EIA were retested; those repeatedly reactive were then confirmed by immunofluorescence assay (IFA) and resolved in the event of any discrepancy, by Western blot (WB). Only those sera confirmed positive by the IFA or WB were considered positive in the calculation of HIV seroprevalence rates.

The enzyme immunoassay for the qualitative detection of antibody to hepatitis C virus (anti-HCV) in human serum or plasma was the Hepatitis C Virus Encoded Antigen (Recombinant c100-3, HC-31, and HC-34) Abbott HCV EIA 2.0. Sera that were reactive on the initial EIA were reported as having the antibody detected.

Sera were also tested for the presence of anti-HBc by the Abbott Corzyme EIA. If the specimen was anti-HBc negative, it was tested for the presence of HBsAg by the Abbott Auszyme Monoclonal EIA. The HBV status was interpreted as follows: negative (anti-HBc and HBsAg EIA negative), current or chronic infection (anti-HBc EIA reactive and HBsAg EIA reactive), or infection at undetermined time (anti-HBc EIA reactive and HBsAg EIA non-reactive).

## **Statistical Analysis**

Statistical analysis was conducted using SAS-PC version 6.10 (Statistical Analysis Systems for Personal Computers, Cary, North Carolina) and Epi Info version 6.0.<sup>12</sup> Frequency distributions

were compared using the chi-square test for independence. Ninety-five percent confidence intervals for HIV-Ab, HBV exposure, and anti-HCV seroprevalence rates were calculated assuming binomial distributions for the numbers testing positive.<sup>13</sup> When the number testing positive was less than five, Fisher's exact limits were calculated. Seroprevalence rates in subgroups were compared using ratios of rates as estimates of relative risk. Approximate 95 % confidence intervals were calculated for odds ratios using the test-based method of Miettinen in combination with procedures described by Mantel and Haenzel.<sup>12</sup> Seroprevalence rates were computed excluding missing/unknown values.

## IV. RESULTS

### Sample Tested

During the study period, 5,279 inmates received intake physical examinations at the six reception centers selected for this study (**Figure A**). Of these, 97.4 % had serum tested for the presence of HIV-Ab, HBsAg, anti-HBc, and anti-HCV. Serum was not tested for the remaining inmates because no blood was drawn, the quantity was not sufficient, or the specimen was not saved. Of the 5,142 serum specimens tested for HIV-Ab and anti-HCV, 126 were positive for HIV-Ab (106 men and 20 women) and 2,108 were positive for anti-HCV (1,768 men and 340 women). Of the 5,144 serum specimens tested for anti-HBc and HBsAg, 1,736 were positive for anti-HBc (1,426 men and 300 women) and 112 were currently or chronically infected with HBV (104 men and 8 women).

### Demographic Comparisons

**Figure B** shows the racial/ethnic distribution of entering inmates included in the study by gender. Among men in the sample, Latinos represented 32 %, followed by African Americans (29 %), and Whites (27 %). Among women in the sample, Whites represented 36 %, followed by African Americans (34 %), and Latinas (24 %).

**Figure C** shows the age group distribution of entering inmates included in the study by gender. Among men and women, participants were predominantly between 25 and 39 years of age (58 % and 68 % respectively).

### HIV-Ab Seroprevalence Rates

**Table 1 and Figure D** present HIV-Ab seroprevalence by gender and race/ethnicity. The overall HIV-Ab seroprevalence among men was 2.4 % (95 % confidence interval [CI], 2.0 % to 2.9 %). African American men were twice as likely to be HIV infected compared to White men (OR=1.8; 95 % CI, 1.1 % to 2.8 %).

The rate among women was 3.2 % (95 % CI, 2.0 % to 5.0 %). Among women, seroprevalence was higher among Latinas and African Americans compared to Whites, but the differences were not significant.

**Table 2 and Figure E** present HIV-Ab seroprevalence by gender and age group. For both men and women, the HIV-Ab seroprevalence rates varied by age group. Among men, rates were highest between 25-29 years of age (3.1 %; 95 % CI, 2.1 % to 4.4 %) and lowest under 25 years of age (1.1 %; 95 % CI, 0.6 % to 2.2 %). Men between 25-29 years of age were more likely to be HIV infected compared to men under 25 years of age (OR= 2.8; 95 % CI, 1.3 % to 6.1 %).

Among women, rates were highest between 35-39 years of age (5.3 %; 95 % CI, 2.2 % to 11.7 %) and lowest under 25 years of age (0 %; 95 % CI, 0.1 % to 6.7 %).

## Current/Chronic (HBsAg) and Past (anti-HBc) Seroprevalence Rates

**Table 3 and Figure F** present Current/Chronic and Past HBV seroprevalence by gender and race/ethnicity. The overall current/chronic HBV seroprevalence among men was 2.4 % (95 % CI, 1.9 % to 2.9 %). Among men, 2.8 % of Whites were found to have current/chronic HBV infection, compared to 2.2 % of African Americans, and 1.7 % of Latinos.

The rate among women was 1.3 % (95 % CI, 0.9 % to 1.9 %). Among women, 2.3 % of African Americans were found to have current/chronic HBV infection, followed by 0.9 % of Whites.

The overall past HBV seroprevalence among men was 32.1 % (95 % CI, 30.7 % to 33.6 %). Among men, 36.0 % of Whites were found to have past HBV infection, followed by 29.6 % of African Americans, and 29.1 % of Latinos.

The rate among women was 47.9 % (95 % CI, 43.8 % to 51.9 %). Among women, Latinas (56.1 %) were found to have past HBV infection, followed by Whites (48.0 %), and African Americans (38.3 %).

**Table 4 and Figure G** present current/chronic and past HBV seroprevalence by gender and age group. Among men, current/chronic HBV rates were highest between 30-34 years of age (3.2 %; 95 % CI, 2.2 % to 4.6 %) and lowest between 25-29 years of age (1.9 %; 95 % CI, 1.1 % to 3.0 %).

Among women, current/chronic HBV rates were highest between 35-39 years of age (1.8 %; 95 % CI, 0.3 % to 6.9 %) and lowest under 25 years of age (0 %; 95 % CI, 0.1 % to 6.7 %).

Among men, past HBV rates were highest over 39 years of age (55.5 %; 95 % CI, 51.9 % to 59.1 %) and lowest under 25 years of age (9.5 %; 95 % CI, 7.7 % to 11.7 %). Men over 39 years of age were more likely to have past HBV infection compared to men under 25 years of age (OR= 11.9; 95 % CI, 9.1 % to 15.7 %).

Among women, past HBV rates were highest between 35-39 years of age (63.7 %; 95 % CI, 54.1 % to 72.6 %) and lowest under 25 years of age (32.4 %; 95 % CI, 21.8 % to 45.1 %). Women between 35-39 years of age were more likely to have past HBV infection compared to women under 25 years of age (OR= 3.7, 95 % CI, 1.9 % to 7.3 %).

## Anti-HCV Seroprevalence Rates

**Table 5 and Figure H** present anti-HCV seroprevalence by gender and race/ethnicity. The overall anti-HCV seroprevalence among men was 39.4 % (95 % CI, 37.9 % to 40.9 %). Among men, 49.3 % of Whites were found to have HCV infection, followed by 40.3 % of Latinos, and 29.3 % of African Americans.

The rate among women was 54.5 % (95 % CI, 50.5 % to 58.4 %). Among women,

69.6 % of Latinas were found to have HCV infection, followed by 58.1 % of Whites, and 37.9 % of African Americans.

**Table 6 and Figure I** present anti-HCV seroprevalence by gender and age group. Among men, anti-HCV rates were highest over 39 years of age (59.6 %; 95 % CI, 56.0 % to 63.1 %) and lowest under 25 years of age (12.3 %; 95 % CI, 10.3 % to 14.7 %). Men over 39 years of age were more likely to have HCV infection compared to men under 25 years of age (OR= 10.5; 95 % CI, 8.1 % to 13.5 %).

Among women, anti-HCV rates were highest between 35-39 years of age (67.3 %; 95 % CI, 57.7 % to 75.8 %) and lowest under 25 years of age (35.3 %; 95 % CI, 24.4 % to 48.1 %). Women between 35-39 years of age were more likely to have HCV infection compared to women under 25 years of age (OR= 3.8; 95 % CI, 1.9 % to 7.5 %).

**Table 7** presents a comparison of HIV-Ab, HBV exposure, and anti-HCV rates by gender and race/ethnicity. Among men, rates for HBV exposure (38.9 %) and Anti-HCV (49.3 %) were highest in Whites. African American men had the highest (3.8 %) HIV-Ab rate.

Among women, rates for HIV-Ab (4.7 %), HBV exposure (56.1 %), and anti-HCV (69.6 %) were highest in Latinas.

**Table 8** presents a comparison of HIV-Ab, HBV exposure, and anti-HCV rates by gender and age group. Among men, HBV exposure (57.7 %) and anti-HCV (59.6 %) were highest over 39 years of age. Men between 25-29 years of age had the highest (3.1 %) HIV-Ab rate.

Among women, HIV-Ab (5.3 %), HBV exposure (65.5 %), and anti-HCV (67.3 %) were highest between 35-39 years of age.

**Table 9** presents HIV-Ab seroprevalence by gender, race/ethnicity, and prior incarceration status. The overall HIV-Ab seroprevalence among men with a prior incarceration was 2.5 % (95 % CI, 1.9 % to 3.2 %) compared to 2.4 % (95 % CI, 1.8 % to 3.3 %) among men with no prior incarceration. Among men with a prior incarceration, HIV-Ab rates (4.4 %) were highest in African Americans and lowest (1.2 %) in Latinos. When compared to men with no prior incarceration, HIV-Ab rates (3.2 %) were highest in Whites and lowest (1.7 %) in Latinos.

The rate among women with a prior incarceration was 3.5 % (95 % CI, 1.9 % to 6.2 %) compared to 3.1 % (95 % CI, 1.5 % to 6.4 %) among women with no prior incarceration. Among women with a prior incarceration, HIV-Ab rates (4.8 %) were highest in Latinas and lowest (1.8 %) in Whites. Compared to women with no prior incarceration, HIV-Ab rates (4.8 %) were highest in Latinas and lowest (0.9 %) in Whites.

**Table 10** presents HIV-Ab seroprevalence by gender, age group, and prior incarceration status. Among men with a prior incarceration, HIV-Ab rates (3.2 %) were highest over 39 years of age and lowest (0.3 %) under 25 years of age. Compared to men with no prior incarceration,

HIV-Ab rates (2.9 %) were highest between 25-29 years of age and lowest (1.8 %) under 25 years of age.

Among women with a prior incarceration, HIV-Ab rates (8.8 %) were highest between 35-39 years of age and lowest (0.0 %) under 25 years of age and in women over 39 years of age. When compared to women with no prior incarceration, HIV-Ab rates (6.3 %) were highest between 30-34 years of age.

**Table 11** presents HBV exposure rates by gender, race/ethnicity, and prior incarceration status. The overall HBV exposure rate among men with a prior incarceration was 41.5 % (95 % CI, 39.4 % to 43.6 %) compared to 24.0 % (95 % CI, 22.0 % to 26.2 %) among men with no prior incarceration. Among men with a prior incarceration, HBV rates (47.0 %) were highest in Whites and lowest (37.0 %) in African Americans. Compared to men with no prior incarceration, HBV rates (28.5 %) were highest in Whites and lowest (21.7 %) in African Americans. Latino men with a prior incarceration were more likely to be HBV exposed compared to Latino men with no prior incarceration (OR=2.4; 95 % CI, 1.9 % to 3.1 %).

The rate among women with a prior incarceration was 55.9 % (95 % CI, 50.5 % to 61.3 %) compared to 38.6 % (95 % CI, 32.6 % to 44.9 %) among women with no prior incarceration. Among women with a prior incarceration, HBV rates (65.1 %) were highest in Latinas and lowest (44.6 %) in African Americans. Compared to women with no prior incarceration, HBV rates (41.9 %) were highest in Latinas and lowest (34.7 %) in African Americans. Latino women with a prior incarceration were more likely to be HBV exposed compared to Latino women with no prior incarceration (OR= 2.6; 95 % CI, 1.2 % to 5.4 %).

**Table 12** presents HBV exposure rates by gender, age group, and prior incarceration status. Among men with a prior incarceration, HBV rates (63.8 %) were highest over 39 years of age and lowest (13.4 %) under 25 years of age. Compared to men with no prior incarceration, HBV rates (46.6 %) were highest over 39 years of age and lowest (10.0 %) under 25 years of age. Men between 35-39 years of age with a prior incarceration were more likely to be HBV exposed compared to men in the same age group with no prior incarceration (OR=2.3; 95 % CI, 1.6 % to 3.2 %).

Among women with a prior incarceration, HBV rates (72.1 %) were highest between 35-39 years of age and lowest (48.0 %) between 25-29 years of age. Compared to women with no prior incarceration, HBV rates (59.6 %) were highest over 39 years of age and lowest (16.3 %) under 25 years of age. Women between 25-29 years of age with a prior incarceration were more likely to be HBV exposed compared to women in the same age group with no prior incarceration (OR=3.1; 95 % CI, 1.3 % to 7.9 %).

**Table 13** presents anti-HCV seroprevalence rates by gender, race/ethnicity, and prior incarceration status. The overall anti-HCV rate among men with a prior incarceration was 49.4 % (95 % CI, 47.3 % to 51.5 %) compared to 27.4 % (95 % CI, 25.3 % to 29.6 %) among men with no prior incarceration. Among men with a prior incarceration, anti-HCV rates (60.4 %) were highest in Whites and lowest (34.2 %) in African Americans. Compared to men with no prior incarceration, anti-HCV rates (34.9 %) were highest in Whites and lowest (20.2 %) in African Americans.

Latino men with a prior incarceration were more likely to have HCV infection compared to Latino men with no prior incarceration (OR=3.6; 95 % CI, 2.8 % to 4.6 %).

The rate among women with a prior incarceration was 59.4 % (95 % CI, 54.0 % to 64.6 %) compared to 48.4 % (95 % CI, 42.2 % to 54.8 %) among women with no prior incarceration. Among women with a prior incarceration, anti-HCV rates (78.3 %) were highest in Latinas and lowest (40.3 %) in African Americans. Compared to women with no prior incarceration, Anti-HCV rates (59.7 %) were highest in Latinas and lowest (33.3 %) in African Americans. Latino women with a prior incarceration were more likely to have HCV infection compared to Latino women with no prior incarceration (OR=2.4; 95 % CI, 1.1 % to 5.4 %).

**Table 14** presents anti-HCV seroprevalence rates by gender, age group, and prior incarceration status. Among men with a prior incarceration, anti-HCV rates (71.3 %) were highest over 39 years of age and lowest (19.3 %) under 25 years of age. Compared to men with no prior incarceration, anti-HCV rates (43.7 %) were highest between 35-39 years of age and lowest (6.8 %) under 25 years of age. Men over 39 years of age with a prior incarceration were more likely to have HCV infection compared to men in the same age group with no prior incarceration (OR= 3.5; 95 % CI, 2.5 % to 4.8 %).

Among women with a prior incarceration, anti-HCV rates (75.0 %) were highest between 35-39 years of age and lowest (45.3 %) between 25-29 years of age. Compared to women with no prior incarceration, anti-HCV rates (63.2 %) were highest over 39 years of age and lowest (25.6 %) under 25 years of age. Women between 35-39 years of age with a prior incarceration were more likely to have HCV infection compared to women in the same age group with no prior incarceration (OR= 2.4; 95 % CI, 1.0 % to 5.8 %).

### **Viral Hepatitis Serology in Relation to HIV Status**

**Table 15** presents the distribution of seromarkers for anti-HBc, HBsAg, and anti-HCV among HIV positive and HIV negative serum samples by gender.

Among HIV-positive men, 23 serum samples (21.7 %) had no serologic evidence of infection with these viruses, whereas 66.0 % had experienced infection with HBV and 61.3 % infection with HCV. Forty nine percent had serologic evidence of infection with both HBV and HCV (4.7 % HBsAg and HCV and 48.1 % anti-HBc and HCV).

Among HIV-positive women, only 2 serum samples (10.0 %) had no serologic evidence of infection with these viruses, whereas 70.0 % had experienced infection with HBV and 85.0 % infection with HCV. Sixty five percent had serologic evidence of infection with both HBV and HCV (0.0 % HBsAg and HCV and 65.0 % anti-HBc and HCV).

Among HIV-negative men, 2,238 serum samples (53.2 %) were free of viral hepatitis markers that would indicate past or current infection, whereas 32.1 % had experienced an HBV infection and 39.6 % an HCV infection. Serologic evidence for both HBV and HCV infection was

observed in 24.9 % of the group.

Among HIV-negative women, 220 serum samples (36.5 %) were free of viral hepatitis markers, whereas 47.8 % had experienced an HBV infection and 53.8 % an HCV infection. Serologic evidence for both HBV and HCV infection was observed in 38.2 %.

### **Risk Behaviors**

Some correctional facilities collected HIV exposure information as part of the admission process. If risk exposure data were obtained during the admission process, this information was collected for each eligible specimen. Of the 5,142 eligible specimens for this study, 899 (17.5 %) specimens had risk information data. Of the 899 eligible specimens with risk exposure data, 873 (97.1 %) had used intravenous drugs since 1978. The other risk exposure categories included 1) cocaine use (1.4 %), 2) amphetamine use (0.6 %), 3) having received blood products (0.3 %), 4) men who have sex only with men (0.2 %), 5) having received money or drugs for sex (0.2 %), and 6) being a sex partner of an intravenous drug user (0.1 %). Among inmates who had used intravenous drugs since 1978, there were 37/873 (4.2 %) HIV positive, 16/873 (1.8 %) HBsAg positive, 544/873 (62.3 %) anti-HBc, and 664/873 (76.1 %) HCV positive.

## V. DISCUSSION

This study is the largest survey of its type among incoming California prisoners. This study includes demographic comparisons in HIV, HBV, and HCV seroprevalence unavailable in other prison population studies. The prevalences of HIV infection among prisoners entering the California correctional system in 1994 were similar to the prevalences found in our previous study conducted in the Spring of 1988.<sup>11</sup> In that study, HIV seroprevalence rates were 2.5 % (95 % CI, 2.1 % to 3.0 %) among the 5,372 men tested and 3.1 % (95 % CI, 2.1 % to 4.5 %) among the 807 women tested.

While this estimate is relatively low compared to infection rates of 15 % to 20 % reported in prison populations in high AIDS incidence areas,<sup>14,15</sup> it is probably closer to the infection rate in the federal correctional system. At year-end 1993, 21,538 of the 880,101 inmates held in U.S. prisons (2.4 % of Federal and State prison inmates) were known to be infected with HIV.<sup>8</sup>

Demographically, HIV infections are more likely to occur among men than women, among African Americans and Latinos/as than Whites, and among young to early middle aged adults. HIV seroprevalence in correctional facilities varies geographically and, as shown in Appendix 1, appears to be highest in New York.

In contrast to the low HIV seroprevalence, 32.1 % of male inmates and 47.9 % of female inmates were anti-HBc positive, and 39.4 % of male inmates and 54.5 % of female inmates were Anti-HCV positive. These are indicators of potential risk for future HIV infection. The high prevalence of anti-HBc and anti-HCV suggest that inmates have a high rate of infection with hepatitis B and hepatitis C compared to the non-incarcerated population (0.4 % in blood donors).<sup>16</sup>

Although no true confirmatory test for hepatitis C infection has been developed, we plan to perform supplemental testing on 10 % of all specimens that were repeatedly reactive for HCV antibodies by EIA. We will use the Recombinant Immunoblot Assay (Chiron Corporation Emeryville, CA and Ortho Diagnostic Systems, Raritan, New Jersey) to evaluate repeatedly reactive results obtained from the screening assay.

Hepatitis B virus (HBV) is a major cause of acute and chronic hepatitis, cirrhosis, and hepatocellular carcinoma worldwide. In the United States, an estimated 1 to 1.25 million people have chronic HBV infection.<sup>9</sup> Most people with chronic HBV infection are not aware that they are infected and become a source of infection for persons with multiple sexual partners.<sup>9</sup> HBV is transmitted primarily by percutaneous and mucous membrane exposures to infectious body fluids.<sup>9</sup> HBsAg, a marker of active HBV infection, has been detected in a wide variety of body fluids but only serum, semen, and saliva have been demonstrated to be infectious.<sup>9</sup> HBsAg was present in 2.4 % (98/4,140) serum samples from male inmates compared to 1.3 % (8/624) serum samples from female inmates. The United States has adopted a comprehensive strategy for eliminating transmission of HBV based on 1) universal HBsAg screening of pregnant women and immunoprophylaxis of infants born to potentially infectious mothers, to prevent perinatal infections; and 2) integrating HBV vaccine into current childhood immunization schedules to prevent early-

childhood infections in high-risk populations and provide immunity to teenagers and adults prior to their becoming at risk of infection.<sup>9</sup>

Hepatitis C virus (HCV), the primary etiologic agent of parenterally transmitted non-A, non-B (NANB) hepatitis, is also a major cause of acute and chronic hepatitis and cirrhosis worldwide.<sup>9</sup>

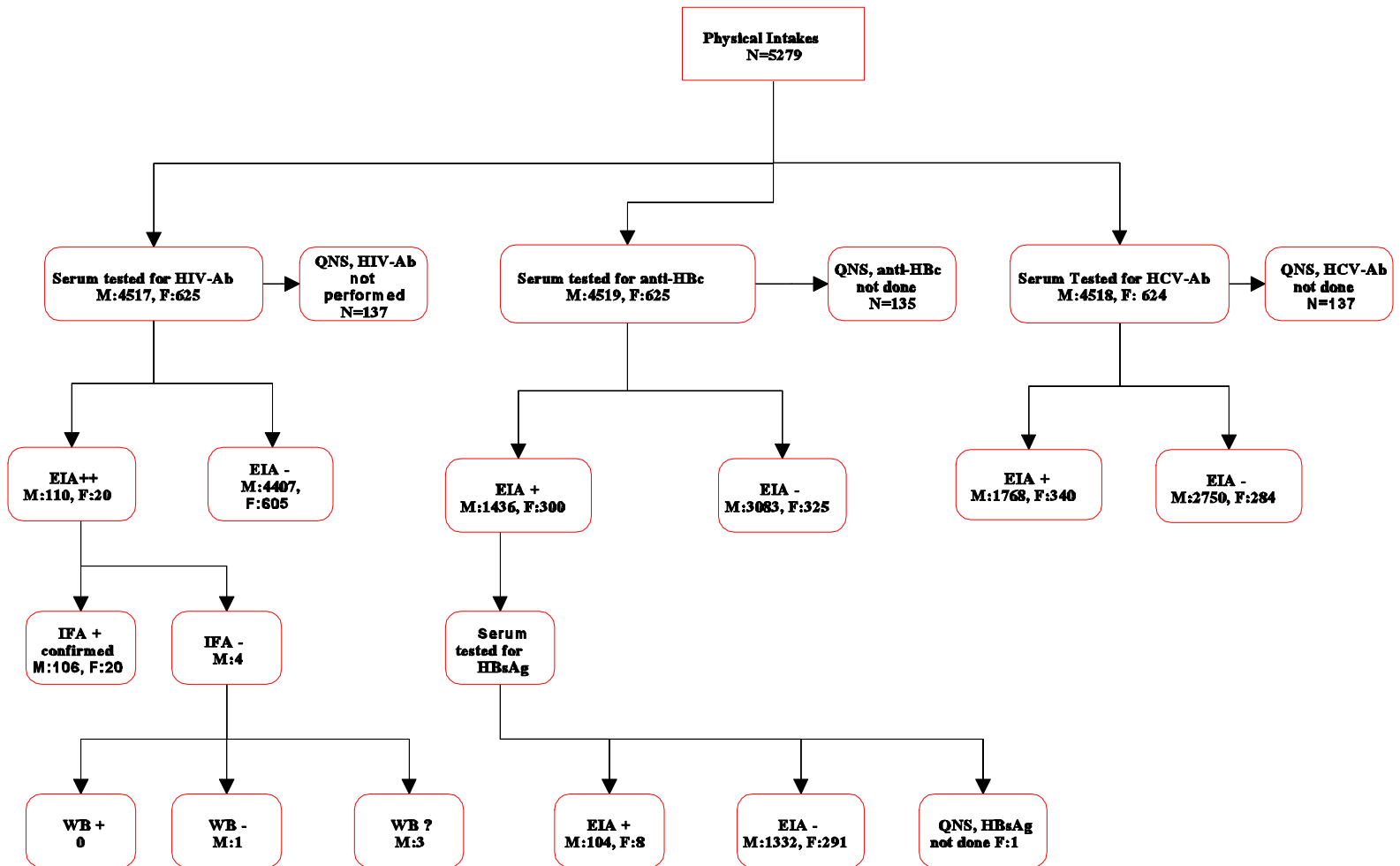
The highest prevalence rates of anti-HCV are found among injection drug users and hemophilia patients (60%-90%).<sup>9</sup> The most efficient transmission of HCV is associated with direct percutaneous exposure to blood, such as through transfusion of blood or blood products, transplantation of organs from infectious donors, sharing of contaminated needles among injection drug users, and health care workers experiencing needle stick injuries.<sup>9</sup> A study conducted in a correctional institution in Canada found that 29.8 % of the inmates were positive for anti-HCV.<sup>16</sup>

Infections with HBV, HCV, and HIV are common in certain populations, but their frequency and interrelations are not well established. Among male and female inmates infected with HIV, 47/106 (44.3 %) and 13/20 (65.0 %) were also positive for anti-HBc and Anti-HCV.

Because of the risk of HIV, HBV, and HCV transmission in prison populations, the California Department of Corrections needs to plan and implement prevention strategies designed to encourage voluntary behavior change and to facilitate effective risk reduction counseling.

This unlinked seroprevalence survey in California's correctional facilities provides public health officials with useful information about HIV, HBV, and HCV infection rates. A comprehensive approach to eliminating HIV, HBV, and HCV transmission must address teen and adult inmates that are hard to reach, especially those who do not realize they are at risk, through health programs, and risk reduction education. Intervention efforts for the control of HBV and HCV infections among the inmate population should include the use of hepatitis B vaccines and routine anti-HCV screening. Prevention efforts should include high-risk behavior modification, such as safer sexual and needle-using practices, and better access to the health care system .

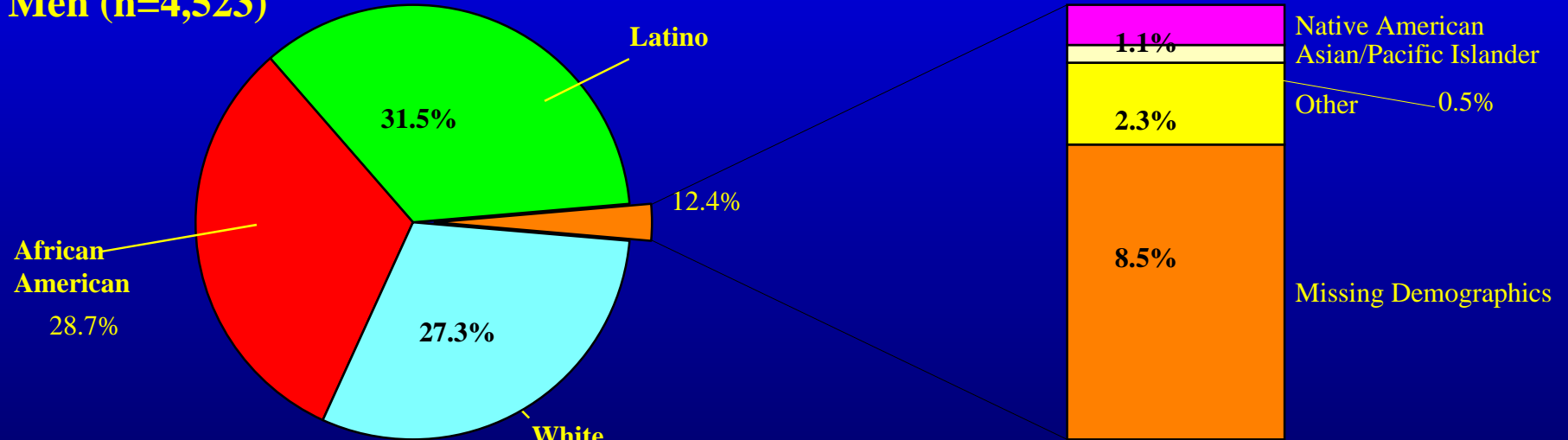
# Figure A: Data Collection and Serological Tests



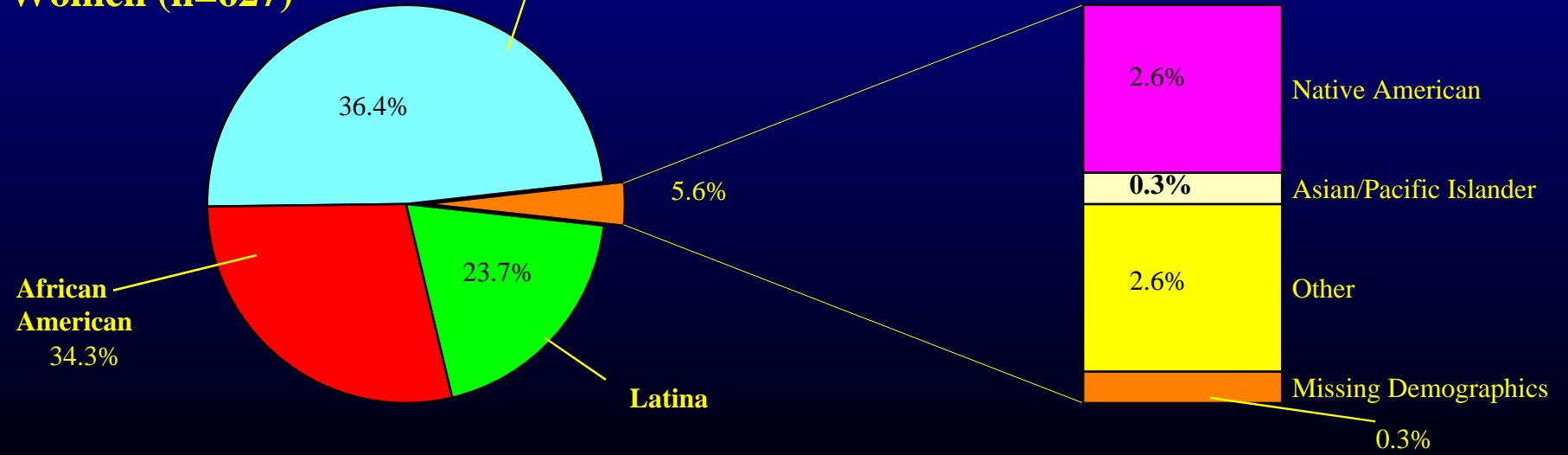
Source: California Department of Health Services, Office of AIDS, 1996

**Figure B. Gender and Racial/Ethnic Distribution Among Study Sample of Inmates Entering the California Correctional System (Aug-Oct 1994)**

**Men (n=4,523)**

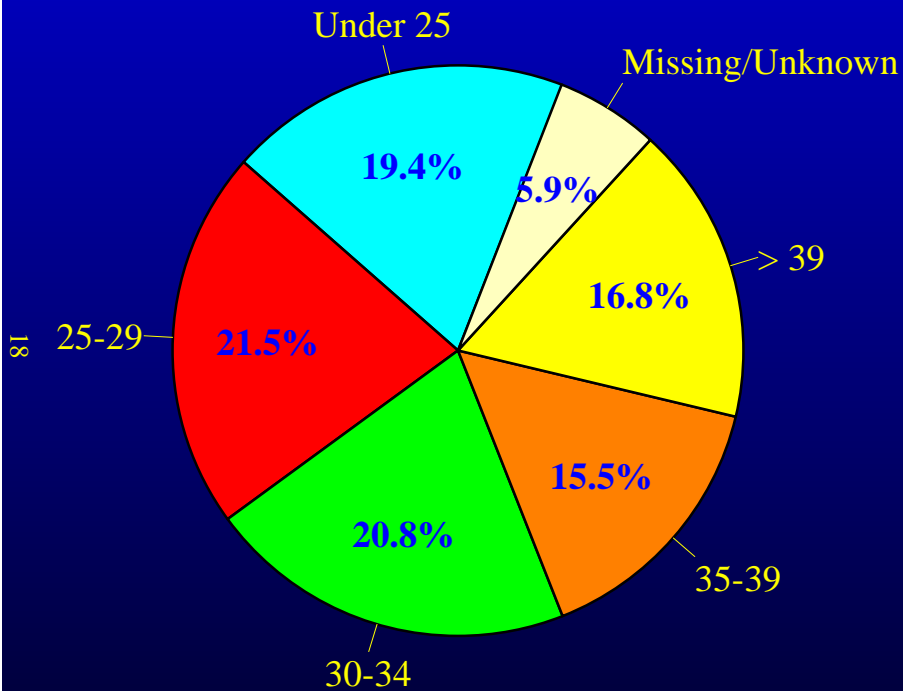


**Women (n=627)**

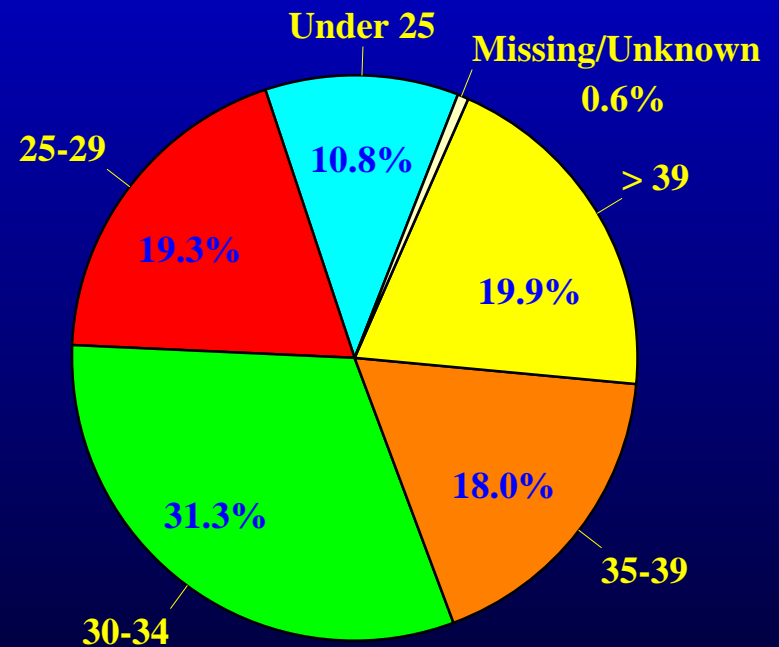


**Figure C. Age and Gender Distribution Among Study Sample of Inmates Entering the California Correctional System (Aug-Oct 1994)**

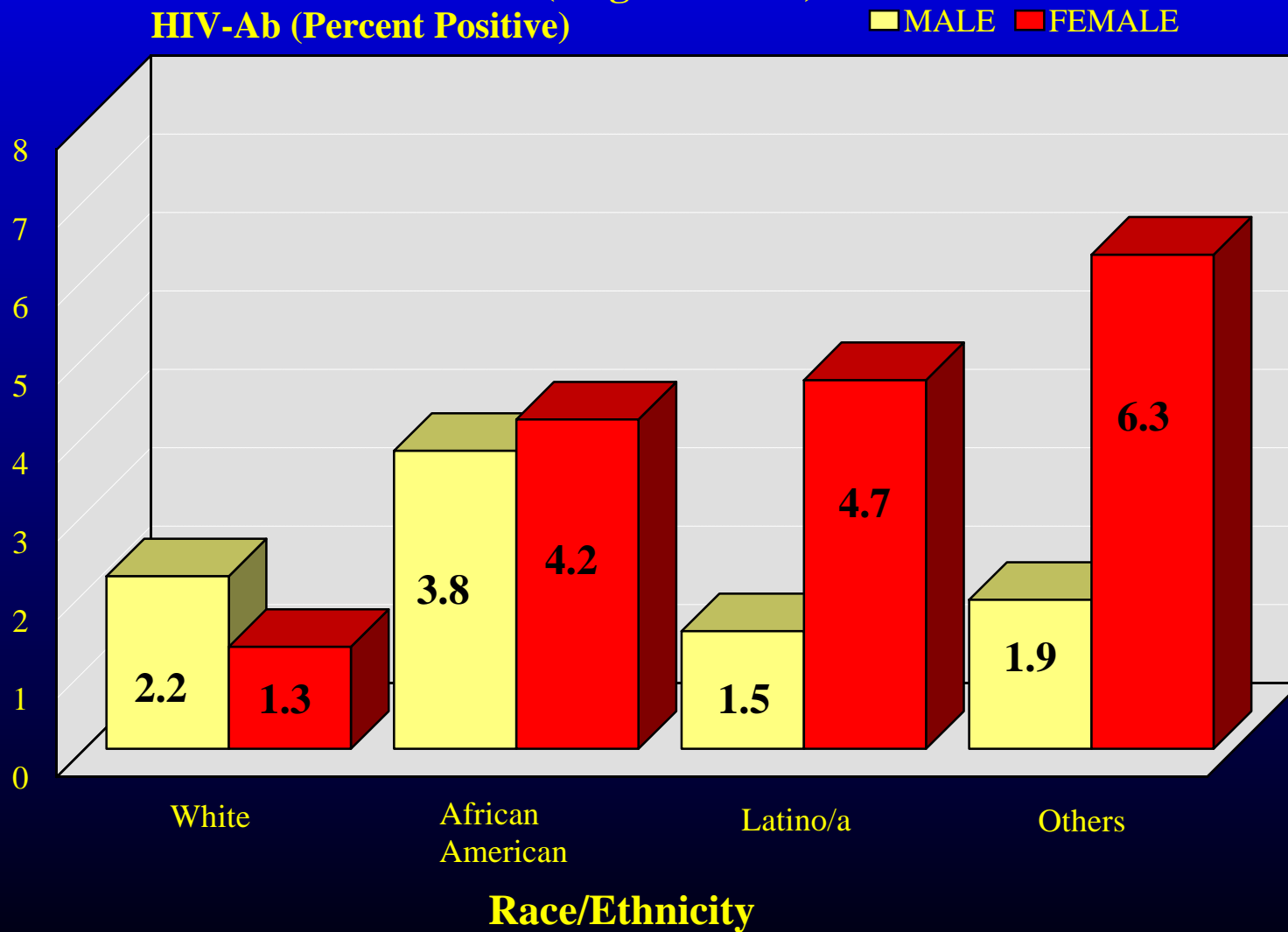
**Men (n=4,523)**



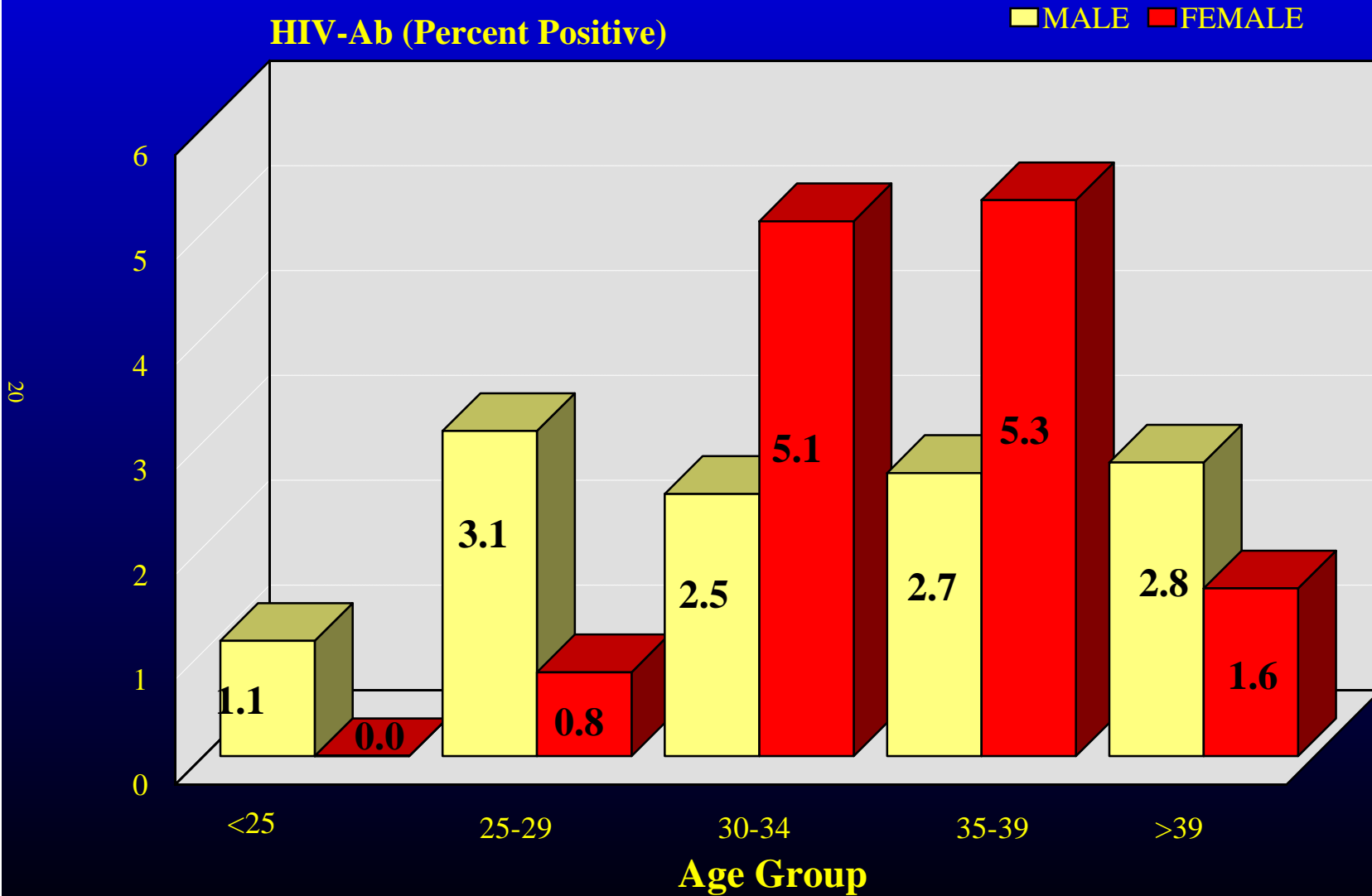
**Women (n=627)**



**Figure D. Seroprevalence of HIV-Ab Among Inmates Entering the California Correctional System by Gender and Race/Ethnicity (Aug-Oct 1994)**

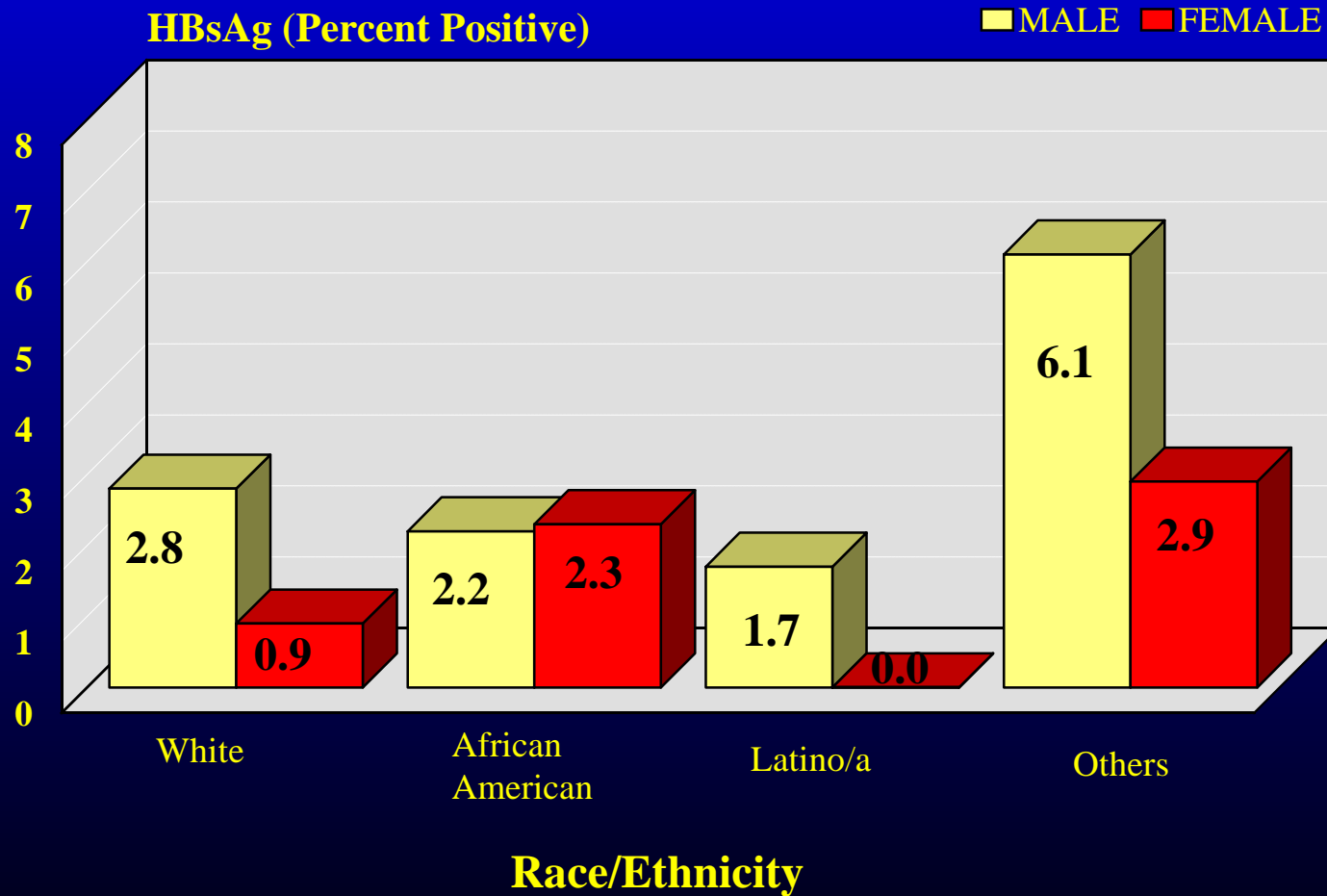


**Figure E. Seroprevalence of HIV-Ab Among Inmates Entering the California Correctional System by Gender and Age Group (Aug-Oct 1994)**



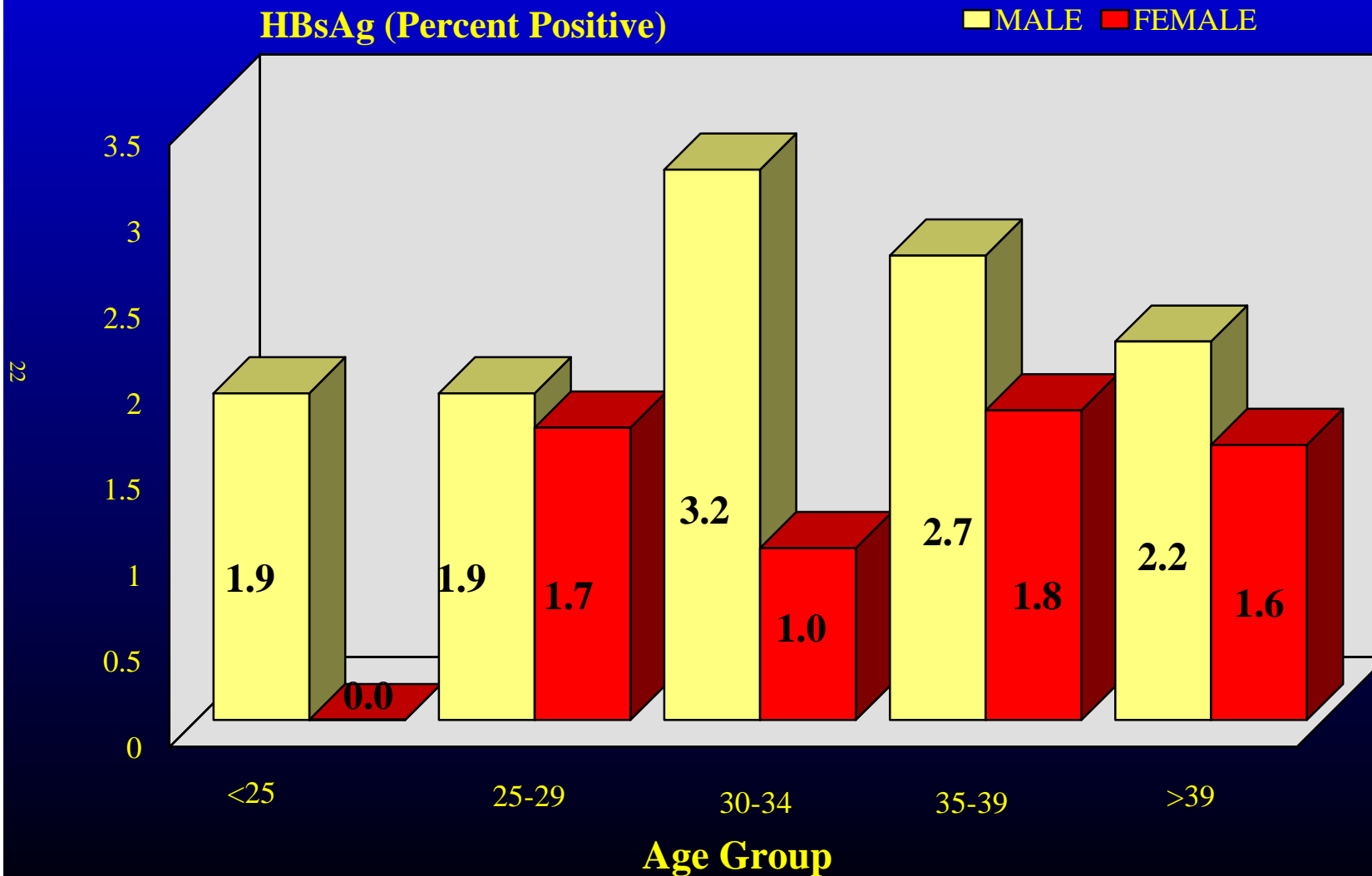
Source: California Department of Health Services, Office of AIDS, 1996

**Figure F. Seroprevalence of HBsAg Among Inmates Entering the California Correctional System by Gender and Race/Ethnicity (Aug-Oct 1994)**



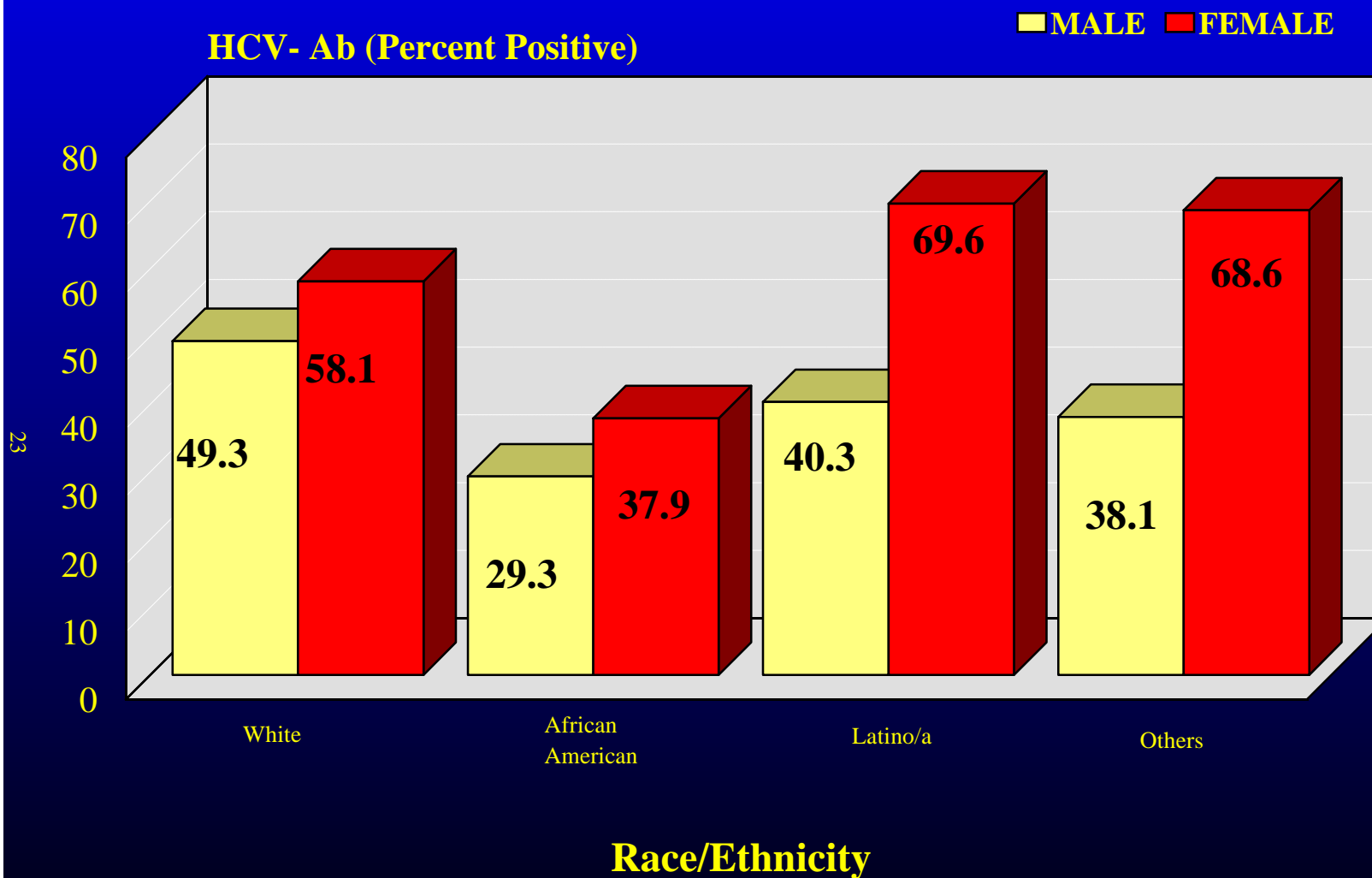
21

**Figure G. Seroprevalence of HBsAg Among Inmates Entering the California Correctional System by Gender and Age Group (Aug-Oct 1994)**

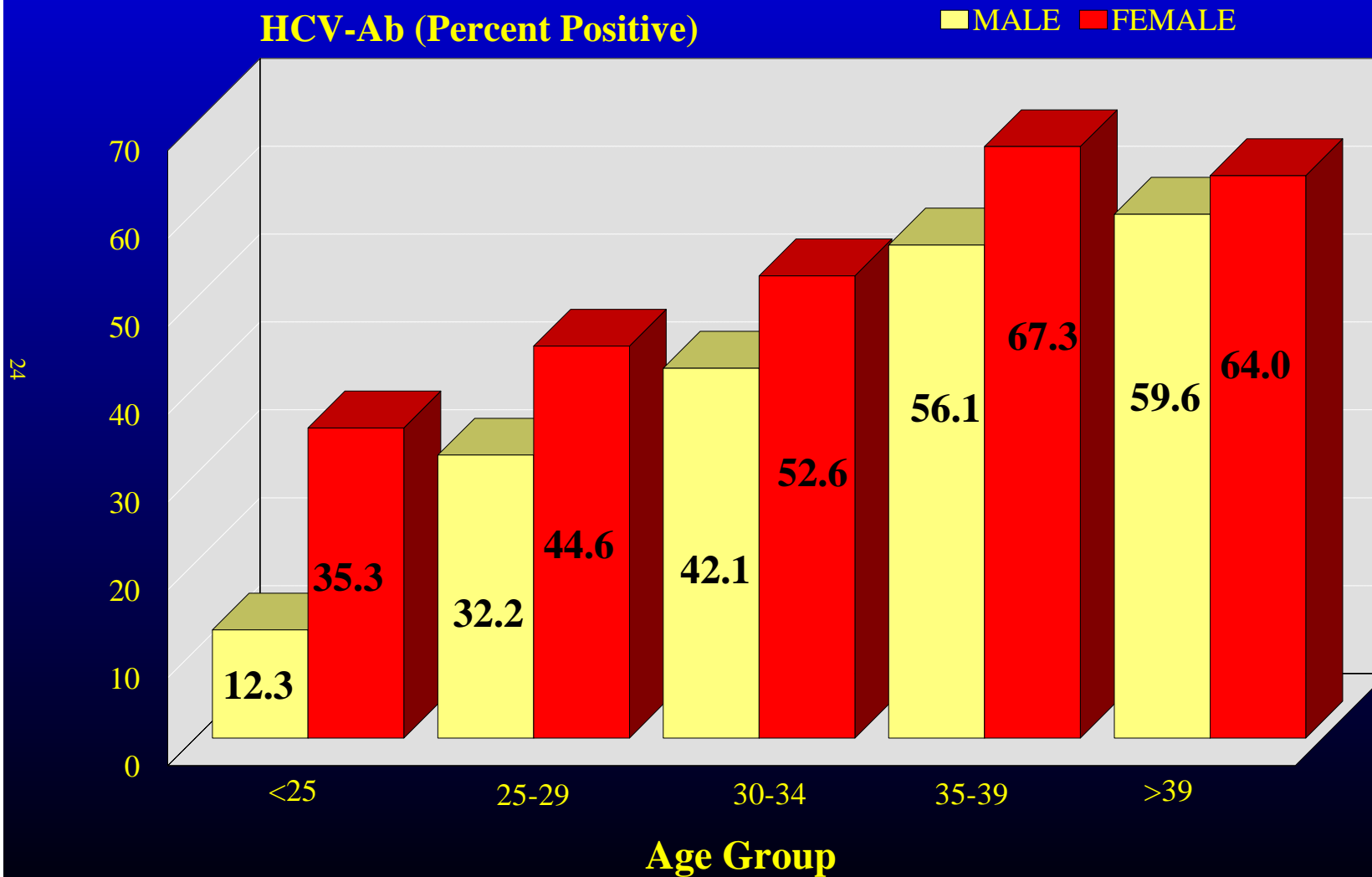


Source: California Department of Health Services, Office of AIDS, 1996

**Figure H. Seroprevalence of HCV-Ab Among Inmates Entering the California Correctional System by Gender and Race/Ethnicity (Aug-Oct 1994)**



**Figure I. Seroprevalence of HCV-Ab Among Inmates Entering the California Correctional System by Gender and Age Group (Aug-Oct 1994)**



Source: California Department of Health Services, Office of AIDS, 1996

Table 1

**HIV-Ab Seroprevalence Among Inmates Entering the California Correctional System  
By Gender and Race/Ethnicity, 1994**

Gender and Race/Ethnicity	N (% of column total)	HIV-Ab Positive (% of column total)*	% HIV-Ab Positive within each row (95% CI)**	Odds Ratio (95% CI)
<b>MEN</b>				
White	1,235 (29.8)	27 (27.0)	2.2 (1.5-3.2)	1.0 (Ref.)
African American	1,299 (31.4)	50 (50.0)	3.8 (2.9-5.1)	1.8 (1.1-3.0)
Latino	1,425 (34.4)	21 (21.0)	1.5 (0.9-2.3)	0.7 (0.4-1.2)
Asian/Pacific Islander	23 (0.6)	0 (0.0)	0.0 (0.0-17.8)	a
American Indian/Alaskan Native	52 (1.3)	0 (0.0)	0.0 (0.0-8.6)	a
Other	106 (2.6)	2 (2.0)	1.9 (0.3-7.3)	a
<b>Sub-Total MEN</b>	<b>4,140 (100)</b>	<b>100 (100)</b>	<b>2.4 (2.0-2.9)</b>	
<b>WOMEN</b>				
White	227 (36.4)	3 (15.0)	1.3 (0.3-4.1)	1.0 (Ref.)
African American	214 (34.3)	9 (45.0)	4.2 (2.1-8.1)	3.3 (0.8-19.0)
Latino	148 (23.7)	7 (35.0)	4.7 (2.0-9.9)	3.7 (0.8-22.5)
Asian/Pacific Islander	3 (0.5)	0 (0.0)	0.0 (0.0-69.0)	a
American Indian/Alaskan Native	16 (2.6)	1 (5.0)	6.3 (0.3-32.7)	a
Other	16 (2.6)	0 (0.0)	0.0 (0.0-24.1)	a
<b>Sub-Total WOMEN</b>	<b>624 (100)</b>	<b>20 (100)</b>	<b>3.2 (2.0-5.0)</b>	
<b>Total</b>	<b>4,764</b>	<b>120</b>	<b>2.5 (2.1-3.0)</b>	

\* Number HIV-Ab reactive and percent of seropositive within column.

\*\* % HIV-Ab positive and 95% Confidence Interval within each stratum (row).

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown races are excluded. Total specimens tested were N = 5,150; No. Positive = 130.

HIV-Ab = HIV Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay).

Confirmed by IFA (Immunofluorescence Assay) or Western blot when IFA inconclusive.

Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 2**  
**HIV-Ab Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender and Age Group, 1994**

<b>Gender and Age Group</b>	<b>N (% of column total)</b>	<b>HIV-Ab Positive (% of column total)*</b>	<b>% HIV-Ab Positive within each row (95% CI)**</b>	<b>Odds Ratio (95% CI)</b>
<b>MEN</b>				
Under 25	876 (20.6)	10 (9.6)	1.1 (0.6-2.2)	1.0 (Ref.)
25-29	971 (22.8)	30 (28.8)	3.1 (2.1-4.4)	2.8 (1.3-6.1)
30-34	943 (22.2)	24 (23.1)	2.5 (1.7-3.8)	2.3 (1.0-5.1)
35-39	702 (16.5)	19 (18.3)	2.7 (1.7-4.3)	2.4 (1.1-5.6)
>39	762 (17.9)	21 (20.2)	2.8 (1.8-4.3)	2.5 (1.1-5.6)
<b>Sub-Total MEN</b>	<b>4,254 (100)</b>	<b>104 (100)</b>	<b>2.4 (2.0-3.0)</b>	
<b>WOMEN</b>				
Under 25	68 (10.9)	0 (0.0)	0.0 (0.0-6.7)	a
25-29	121 (19.4)	1 (5.3)	0.8 (0.04-5.2)	a
30-34	196 (31.5)	10 (52.6)	5.1 (2.6-9.5)	a
35-39	113 (18.1)	6 (31.6)	5.3 (2.2-11.7)	a
>39	125 (20.1)	2 (10.5)	1.6 (0.3-6.3)	a
<b>Sub-Total WOMEN</b>	<b>623 (100)</b>	<b>19 (100)</b>	<b>3.0 (1.9-4.8)</b>	
<b>Total</b>	<b>4,877</b>	<b>123</b>	<b>2.5 (2.1-3.0)</b>	

\* Number HIV-Ab reactive and percent of seropositive within stratum(column).

\*\* % HIV-Ab positive and 95% Confidence Interval within each stratum (row).

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown age groups are excluded. Total specimens tested were N = 5,150; No. Positive = 130.  
HIV-Ab = HIV Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay).  
Confirmed by IFA (Immunofluorescence Assay) or Western blot when needed.  
Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 3**  
**Current/Chronic and Past HBV Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender and Race/Ethnicity, 1994**

Gender and Race/Ethnicity	N (% column total)	Current/Chronic HBV Infection†			Past HBV Infection‡		
		HBsAg Reactive (% column total)*	%HBsAg Reactive within each row (95% CI)**	Odds Ratio (95% CI)	Anti-HBc Reactive (% column total)*	%Anti-HBc Reactive within each row (95% CI)**	Odds Ratio (95% CI)
<b>MEN</b>							
White	1,235 (29.8)	35 (35.7)	2.8 (2.0-4.0)	1.0	445 (33.5)	36.0 (33.3-38.8)	1.0 (Ref.)
African American	1,299 (31.4)	28 (28.5)	2.2 (1.5-3.1)	(Ref.)	385 (29.0)	29.6 (27.2-32.2)	0.8 (0.6-0.9)
Latino	1,425 (34.4)	24 (24.5)	1.7 (1.1-2.5)	0.8 (0.4-1.3)	414 (31.2)	29.1 (26.7-31.5)	0.7 (0.6-0.9)
Asian/Pacific Islander	23 (0.6)	1 (1.0)	4.3 (0.2-24.2)	0.6 (0.3-1.0)	11 (0.8)	47.8 (27.4-70.2)	1.6 (0.7-4.0)
American Indian/Alaskan Native	52 (1.3)	2 (2.0)	3.8 (0.7-14.4)	a	24 (1.8)	46.2 (32.5-60.8)	1.5 (0.8-2.8)
Other	106 (2.6)	8 (8.1)	7.5 (3.5-14.8)	a	50 (3.8)	47.2 (37.5-57.2)	1.6 (1.0-2.4)
				2.8 (1.2-6.5)			
<b>Sub-Total MEN</b>	<b>4,140 (100)</b>	<b>98 (100)</b>	<b>2.4 (1.9-2.9)</b>		<b>1,329 (100)</b>	<b>32.1 (30.7-33.6)</b>	
<b>WOMEN</b>							
White	227 (36.4)	2 (25.0)	0.9 (0.2-3.5)	a	109 (36.5)	48.0 (41.4-54.8)	1.0 (Ref.)
African American	214 (34.3)	5 (62.5)	2.3 (0.9-5.7)	a	82 (27.4)	38.3 (31.8-45.3)	0.7 (0.5-1.0)
Latino	148 (23.7)	0 (0.0)	0.0 (0.0-3.2)	a	83 (27.8)	56.1 (47.7-64.3)	1.4 (0.9-2.1)
Asian/Pacific Islander	3 (0.5)	0 (0.0)	0.0 (0.0-69.0)	a	0 (0.0)	0.0 (0.0- 69.0)	a
American Indian/Alaskan Native	16 (2.6)	0 (0.0)	0.0 (0.0-24.1)	a	13 (4.3)	81.3 (53.7-99.1)	4.7 (1.2-26.2)
Other	16 (2.6)	1 (12.5)	6.3 (0.3-32.7)	a	12 (4.0)	75.0 (47.4-95.2)	3.3 (0.9-14.2)
<b>Sub-Total WOMEN</b>	<b>624 (100)</b>	<b>8 (100)</b>	<b>1.3 (0.6-2.6)</b>		<b>299 (100)</b>	<b>47.9 (43.8-51.9)</b>	
<b>Total</b>	<b>4,764</b>	<b>106</b>	<b>2.2 (1.8-2.7)</b>		<b>1,628</b>	<b>34.2 (32.8-35.5)</b>	

\* Number HBV surface antigens (HBsAg) or HBV core antibodies (anti-HBc) reactive and percent within column

\*\* % HBsAg or anti-HBc reactive and 95% Confidence Interval within stratum/row

† HBsAg positive

‡ Anti-HBc positive

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown races are excluded. Total specimens tested were N = 5,150; No. Positive Current HBV= 112; No. Positive Past HBV= 1,736. Percent are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 4**  
**Current/Chronic and Past Hepatitis B infections Among Inmates Entering the California Correctional System**  
**By Gender and Age Group, 1994**

Gender and Age Group	N (% of column total)	Current/Chronic HBV Infection†			Past HBV Infection‡		
		HBsAg Reactive (% column total)*	% HBsAg Reactive within each row (95% CI)**	Odds Ratio (95% CI)	Anti-HBc Reactive (% column total)*	% Anti-HBc Reactive within each row (95% CI)**	Odds Ratio (95% CI)
<b>MEN</b>							
Under 25	876 (20.6)	17 (16.8)	1.9 (1.2-3.2)	1.0 (Ref.)	83 (6.1)	9.5 (7.7-11.7)	1.0 (Ref.)
25-29	971 (22.8)	18 (17.6)	1.9 (1.1-3.0)	1.0 (0.5-2.0)	223 (16.4)	23.0 (20.4-25.8)	2.9 (2.2-3.8)
30-34	943 (22.2)	30 (29.4)	3.2 (2.2-4.6)	1.7 (0.9-3.2)	309 (22.8)	32.8 (29.8-35.9)	4.7 (3.6-6.1)
35-39	702 (16.5)	19 (18.6)	2.7 (1.7-4.3)	1.4 (0.7-2.9)	320 (23.6)	45.6 (41.9-49.4)	8.0 (6.1-10.6)
>39	762 (17.9)	17 (16.7)	2.2 (1.3-3.6)	1.2 (0.6-2.4)	423 (31.1)	55.5 (51.9-59.1)	11.9 (9.1-15.7)
<b>Sub-Total MEN</b>	<b>4,254 (100)</b>	<b>101 (100)</b>	<b>2.4 (1.9-2.9)</b>		<b>1,358 (100)</b>	<b>31.9 (30.5-33.4)</b>	
<b>WOMEN</b>							
Under 25	68 (10.9)	0 (0.0)	0.0 (0.0-6.7)	a	22 (7.4)	32.4 (21.8-45.1)	1.0 (Ref.)
25-29	121 (19.4)	2 (25.0)	1.7 (0.3-6.5)	a	45 (15.1)	37.2 (28.7-46.6)	1.2 (0.6-2.4)
30-34	196 (31.4)	2 (25.0)	1.0 (0.2-4.0)	a	87 (29.2)	44.4 (37.4-51.7)	1.7 (0.9-3.1)
35-39	113 (18.1)	2 (25.0)	1.8 (0.3-6.9)	a	72 (24.2)	63.7 (54.1-72.6)	3.7 (1.9-7.3)
>39	125 (20.1)	2 (25.0)	1.6 (0.3-6.3)	a	72 (24.2)	57.6 (48.4-66.4)	2.8 (1.5-5.5)
<b>Sub-Total WOMEN</b>	<b>623 (100)</b>	<b>8 (100)</b>	<b>1.3 (0.6-2.6)</b>		<b>298 (100)</b>	<b>47.8 (43.9-51.8)</b>	
<b>Total</b>	<b>4,877</b>	<b>109</b>	<b>2.2 (1.8-2.7)</b>		<b>1,656</b>	<b>34.0 (32.6-35.9)</b>	

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\* Number HBV surface antigens (HBsAg) or HBV core antibodies (anti-HBc) reactive and percent within column

\*\* % HBsAg or anti-HBc reactive and 95% Confidence Interval within stratum/row

† HBsAg positive

‡ Anti-HBc positive

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown age groups are excluded. Total specimens tested were N = 5,150; No. Positive Current HBV= 112; No. Positive Past HBV= 1,736. Percent are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 5**  
**Anti-HCV<sup>‡</sup> Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender and Race/Ethnicity, 1994**

Gender and Race/Ethnicity	N (% of column total)	Anti-HCV Positive (% of column total)*	% anti-HCV Positive within each row (95%CI)**	Odds Ratio (95%CI)
<b>MEN</b>				
White	1,235 (29.8)	609 (37.3)	49.3 (46.5-52.1)	1.0 (Ref.)
African American	1,299 (31.4)	380 (23.3)	29.3 (26.8-31.8)	0.4 (0.4-0.5)
Latino	1,425 (34.4)	574 (35.2)	40.3 (37.7-49.5)	0.7 (0.6-0.8)
Asian/Pacific Islander	23 (0.6)	6 (0.4)	26.1 (11.1-49.5)	0.4 (0.1-1.0)
American Indian/Alaskan Native	52 (1.3)	30 (1.8)	57.7 (43.3-71.5)	1.4 (0.8-2.6)
Other	106 (2.6)	33 (2.0)	31.1 (22.7-41.1)	0.5 (0.3-0.7)
<hr style="border-top: 1px dashed black;"/>				
<b>Sub-Total MEN</b>	<b>4,140 (100)</b>	<b>1,632 (100)</b>	<b>39.4 (37.9-40.9)</b>	
<b>WOMEN</b>				
White	227 (36.4)	132 (38.8)	58.1 (51.4-64.7)	1.0 (Ref.)
African American	214 (34.3)	81 (23.8)	37.9 (31.4-44.8)	0.4 (0.3-0.7)
Latino	148 (23.7)	103 (30.3)	69.6 (61.4-76.9)	1.7 (1.0-2.6)
Asian/Pacific Islander	3 (0.5)	0 (0.0)	0.0 (0.0-69.0)	a
American Indian/Alaskan Native	16 (2.6)	14 (4.1)	87.5 (60.4-102.7)	5.0 (1.1-46.5)
Other	16 (2.6)	10 (2.9)	62.5 (35.9-86.4)	1.2 (0.4-4.2)
<hr style="border-top: 1px dashed black;"/>				
<b>Sub-Total WOMEN</b>	<b>624 (100)</b>	<b>340 (100)</b>	<b>54.5 (50.5-58.4)</b>	
<hr style="border-top: 3px double black;"/>				
<b>Total</b>	<b>4,764</b>	<b>1,972</b>	<b>41.4 (40.0-42.8)</b>	

- \* Number anti-HCV reactive and percent of seropositive within column.
- \*\* % anti-HCV positive and 95% Confidence Interval within each stratum/row.
- ‡ Anti-HCV= Hepatitis C Virus Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay). No confirmatory test performed.
- a Odds ratios not computed because of too few events for meaningful analysis.
- Note: Missing/Unknown races are excluded. Total specimens tested were N= 5,150; Total Positive = 2,108. Percent are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 6**  
**Anti-HCV<sup>‡</sup> Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender and Age Group, 1994**

Gender and Age Group	N (% of column total)	Anti-HCV Positive (% of column total)*	% anti-HCV Positive within each row (95%CI)**	Odds Ratio (95%CI)
<b>MEN</b>				
Under 25	876 (20.6)	108 (6.5)	12.3 (10.3-14.7)	1.0 (Ref.)
25-29	971 (22.8)	313 (18.8)	32.2 (29.3-35.3)	3.4 (2.6-4.3)
30-34	943 (22.2)	397 (23.8)	42.1 (38.9-45.3)	5.2 (4.0-6.6)
35-39	702 (16.5)	394 (23.6)	56.1 (52.4-59.8)	9.1 (7.0-11.8)
>39	762 (17.9)	454 (27.3)	59.6 (56.0-63.1)	10.5 (8.1-13.5)
<b>Sub-Total MEN</b>	<b>4,254 (100)</b>	<b>1,666 (100)</b>	<b>39.2 (37.7-40.7)</b>	
<b>WOMEN</b>				
Under 25	68 (10.9)	24 (7.1)	35.3 (24.4-48.1)	1.0 (Ref.)
25-29	121 (19.4)	54 (16.0)	44.6 (35.7-54.0)	1.5 (0.8-2.9)
30-34	196 (31.5)	103 (30.6)	52.6 (45.3-59.7)	2.0 (1.1-3.7)
35-39	113 (18.1)	76 (22.6)	67.3 (57.7-75.8)	3.8 (1.9-7.5)
>39	125 (20.1)	80 (23.7)	64.0 (54.9-72.4)	3.3 (1.7-6.3)
<b>Sub-Total WOMEN</b>	<b>623 (100)</b>	<b>337 (100)</b>	<b>54.1 (50.1-58.1)</b>	
<b>Total</b>	<b>4,877</b>	<b>2,003</b>	<b>41.1 (39.7-42.5)</b>	

\* Number anti-HCV reactive and percent of seropositive within column.

\*\* % anti-HCV positive and 95% Confidence Interval within each stratum/row.

‡ Anti-HCV= Hepatitis C Virus Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay). No confirmatory test performed.

Note: Missing/Unknown are excluded. Total Specimens tested were N = 5,150; Total anti-HCV positive were 2,108. Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 7**  
**HIV-Ab, HBV Exposure and anti-HCV Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender and Race/Ethnicity, 1994**

Gender and Race/Ethnicity	N (% of column total)	HIV-Ab		HBV Exposure		anti-HCV	
		HIV-Ab Positive (% of column total)*	% HIV-Ab Positive within each row (95% CI)**	HBV Ever Exposed (% of column total)*	% HBV Ever Exposed within each row (95% CI)**	anti-HCV Positive (% of column total)*	% anti-HCV Positive within each row (95% CI)**
<b>MEN</b>							
White	1,235 (29.8)	27 (27.0)	2.2 (1.5-3.2)	480 (33.6)	38.9 (36.1-41.7)	609 (37.3)	49.3 (46.5-52.1)
African American	1,299 (31.4)	50 (50.0)	3.8 (2.9-5.1)	413 (28.9)	31.8 (29.3-34.4)	380 (23.3)	29.3 (26.8-31.8)
Latino	1,425 (34.4)	21 (21.0)	1.5 (0.9-2.3)	438 (30.7)	30.7 (28.4-33.2)	574 (35.2)	40.3 (37.7-42.9)
Asian/Pacific Islander	23 (0.6)	0 (0.0)	0.0 (0.0-17.8)	12 (0.8)	52.2 (31.1-74.0)	6 (0.4)	26.1 (11.1-49.5)
American Indian/Alaskan Native	52 (1.3)	0 (0.0)	0.0 (0.0-8.6)	26 (1.8)	50.0 (36.0-64.5)	30 (1.8)	57.7 (43.3-71.5)
Other	106 (2.6)	2 (2.0)	1.9 (0.3-7.3)	58 (4.1)	54.7 (44.8-64.5)	33 (2.0)	31.1 (22.7-41.1)
<b>Sub-Total MEN</b>	<b>4,140 (100)</b>	<b>100 (100)</b>	<b>2.4 (2.0-2.9)</b>	<b>1,427 (100)</b>	<b>34.5 (33.0-35.9)</b>	<b>1,631 (100)</b>	<b>39.4 (37.9-40.9)</b>
<b>WOMEN</b>							
White	227 (36.4)	3 (15.0)	1.3 (0.3-4.1)	111 (36.2)	48.9 (42.2-55.6)	132 (38.8)	58.1 (51.4-64.7)
African American	214 (34.3)	9 (45.0)	4.2 (2.1-8.1)	87 (28.3)	40.7 (34.1-47.6)	81 (23.8)	37.9 (31.4-44.8)
Latino	148 (23.7)	7 (35.0)	4.7 (2.1-9.9)	83 (27.0)	56.1 (47.7-64.3)	103 (30.3)	69.6 (61.4-76.9)
Asian/Pacific Islander	3 (0.5)	0 (0.0)	0.0 (0.0-69.0)	0 (0.0)	0.0 (0.0-69.0)	0 (0.0)	0.0 (0.0-69.0)
American Indian/Alaskan Native	16 (2.6)	1 (5.0)	6.3 (0.3-32.7)	13 (4.2)	81.3 (53.7-99.1)	14 (4.1)	87.5 (60.4-102.7)
Other	16 (2.6)	0 (0.0)	0.0 (0.0-24.1)	13 (4.2)	81.3 (53.7-99.1)	10 (2.9)	62.5 (35.9-86.4)
<b>Sub-Total WOMEN</b>	<b>624 (100)</b>	<b>20 (100)</b>	<b>3.2 (2.0-5.0)</b>	<b>307 (100)</b>	<b>49.2 (45.2-53.2)</b>	<b>340 (100)</b>	<b>54.5 (50.5-58.4)</b>
<b>Total</b>	<b>4,764</b>	<b>120</b>	<b>2.5 (2.1-3.0)</b>	<b>1,734</b>	<b>36.4 (35.0-37.8)</b>	<b>1,972</b>	<b>41.4 (40.0-42.8)</b>

\* Number HIV-Ab positive or HBV ever exposed or anti-HCV positive and percent within column.

\*\* % HIV-Ab positive or % HBV ever exposed or % anti-HCV positive within stratum /row.

‡ HBV exposure encompasses presence of both HBsAg and anti-HBc

Note: Missing/Unknown races are excluded. Total specimens tested were N = 5,150; No. positive HIV-Ab = 130; No. HBV ever exposed = 1,848; No. positive anti-HCV = 2,108. Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 8**  
**HIV-Ab, HBV Exposure and anti-HCV Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender and Age Group, 1994**

Gender and Age Group	N (% of column total)	HIV-Ab		HBV Exposure‡		anti-HCV	
		HIV-Ab Positive (% of column total)*	% HIV-Ab Positive within each row (95% CI)**	HBV Ever Exposed (% of column total)*	% HBV Ever Exposed within each row (95% CI)**	anti-HCV Positive (% of column total)*	% anti-HCV Positive within each row (95% CI)**
<b>MEN</b>							
Under 25	876 (20.6)	10 (9.6)	1.1 (0.6-2.2)	100 (6.9)	11.4 (9.4-13.8)	108 (6.5)	12.3 (10.3-14.7)
25-29	971 (22.8)	30 (28.8)	3.1 (2.1-4.4)	241 (16.5)	24.8 (22.2-27.7)	313 (18.8)	32.2 (29.3-35.3)
30-34	943 (22.2)	24 (23.1)	2.5 (1.7-3.8)	339 (23.2)	35.9 (32.9-39.1)	397 (23.8)	42.1 (38.9-45.3)
35-39	702 (16.5)	19 (18.3)	2.7 (1.7-4.3)	339 (23.2)	48.3 (44.5-52.1)	394 (23.6)	56.1 (52.4-59.8)
>39	762 (17.9)	21 (20.2)	2.8 (1.8-4.3)	440 (30.2)	57.7 (54.1-61.3)	454 (27.3)	59.6 (56.0-63.1)
<b>Sub-Total MEN</b>	<b>4,254 (100)</b>	<b>104 (100)</b>	<b>2.4 (2.0-3.0)</b>	<b>1,459 (100)</b>	<b>34.3 (32.9-35.8)</b>	<b>1,666 (100)</b>	<b>39.2 (37.7-40.7)</b>
<b>WOMEN</b>							
Under 25	68 (10.9)	0 (0.0)	0.0 (0.0-6.7)	22 (7.2)	32.4 (21.8-45.1)	24 (7.1)	35.3 (24.4-48.1)
25-29	121 (19.4)	1 (5.3)	0.8 (0.04-5.2)	47 (15.4)	38.8 (30.2-48.3)	54 (16.0)	44.6 (35.7-54.1)
30-34	196 (31.5)	10 (52.6)	5.1 (2.6-9.5)	89 (29.1)	45.4 (38.3-52.7)	103 (30.6)	52.6 (45.3-59.7)
35-39	113 (18.1)	6 (31.6)	5.3 (2.2-11.7)	74 (24.2)	65.5 (55.9-74.2)	76 (22.6)	67.3 (55.7-75.8)
>39	125 (20.1)	2 (10.5)	1.6 (0.3-6.3)	74 (24.2)	59.2 (50.0-68.0)	80 (23.7)	64.0 (54.9-72.4)
<b>Sub-Total WOMEN</b>	<b>623 (100)</b>	<b>19 (100)</b>	<b>3.0 (1.9-4.8)</b>	<b>306 (100)</b>	<b>49.1 (45.1-53.1)</b>	<b>337 (100)</b>	<b>54.1 (50.1-58.1)</b>
<b>Total</b>	<b>4,877</b>	<b>123</b>	<b>2.5 (2.1-3.0)</b>	<b>1,765</b>	<b>36.2 (34.8-37.6)</b>	<b>2,003</b>	<b>41.1 (39.7-42.5)</b>

\* Number HIV-Ab positive or HBV ever exposed or anti-HCV positive and percent within column.

\*\* % HIV-Ab positive or % HBV ever exposed or % anti-HCV positive within stratum /row.

‡ HBV exposure encompasses presence of both HBsAg and anti-HBc

Note: Missing/Unknown age groups are excluded. Total Specimens tested were N = 5,150; No. Positive HIV-Ab = 130; No. HBV ever exposed = 1,848; No.

Positive anti-HCV = 2,108;

Percent are rounded independently and may not sum to 100%

Source: California Department of Health Services, Office of AIDS, 1996

**Table 9**  
**HIV- Ab Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender , Race/Ethnicity and Incarceration Status, 1994**

Gender and Race/Ethnicity	Prior Incarceration			No Prior Incarceration			Prior vs No Prior Incarceration Odds Ratio (95% CI)†
	N (% of column total)	HIV-Ab. Positive (% of column total)*	% HIV-Ab Positive within each row (95% CI)**	N (%of column total)	HIV-Ab Positive (% of column total)*	% HIV-Ab Positive within each row (95% CI)**	
<b>MEN</b>							
White	689 (32.0)	10 (18.9)	1.5 (0.7-2.7)	505 (30.0)	16 (39.0)	3.2 (1.9-5.2)	0.5 (0.2-1.1)
African American	821 (38.2)	36 (67.9)	4.4 (3.1-6.1)	451 (26.8)	13 (31.7)	2.9 (1.6-5.0)	1.6 (0.8-3.1)
Latino	597 (27.7)	7 (13.2)	1.2 (0.5-2.5)	701 (41.7)	12 (29.3)	1.7 (0.9-3.0)	0.7 (0.2-1.9)
Asian/Pacific Islander	10 (0.5)	0 (0.0)	0.0 (0.0-34.5)	8 (0.5)	0 (0.0)	0.0 (0.0-40.2)	a
American Indian/Alaskan Native	35 (1.6)	0 (0.0)	0.0 (0.0-12.3)	16 (1.0)	0 (0.0)	0.0 (0.0-24.1)	a
<b>Sub-Total MEN</b>	<b>2,152 (100)</b>	<b>53 (100)</b>	<b>2.5 (1.9-3.2)</b>	<b>1,681 (100)</b>	<b>41 (100)</b>	<b>2.4 (1.8-3.3)</b>	<b>1.0 (0.7-1.6)</b>
<b>WOMEN</b>							
White	113 (32.8)	2 (16.7)	1.8 (0.3-6.9)	112 (44.1)	1 (12.5)	0.9 (0.05-5.6)	a
African American	139 (40.3)	6 (50.0)	4.3 (1.8-9.6)	72 (28.3)	3 (37.5)	4.2 (1.1-12.5)	a
Latino	83 (24.1)	4 (33.3)	4.8 (1.6-12.6)	62 (24.4)	3 (37.5)	4.8 (1.3-14.4)	a
Asian/Pacific Islander	2 (0.6)	0 (0.0)	0 (0.0-80.2)	1 (0.4)	0 (0.0)	0.0 (0.0-94.5)	a
American Indian/Alaskan Native	8 (2.3)	0 (0.0)	0 (0.0-40.2)	7 (2.8)	1 (12.5)	1.4 (0.8-59.7)	a
<b>Sub-Total WOMEN</b>	<b>345 (100)</b>	<b>12 (100)</b>	<b>3.5 (1.9-6.2)</b>	<b>254 (100)</b>	<b>8 (100)</b>	<b>3.1 (1.5-6.4)</b>	<b>1.1 (0.4-3.0)</b>
<b>Total</b>	<b>2,497</b>	<b>65</b>	<b>2.6 (2.0-3.3)</b>	<b>1,935</b>	<b>49</b>	<b>2.5 (1.9-3.4)</b>	<b>1.0 (0.7-1.5)</b>

\* Number HIV-Ab reactive and percent of seropositive within column.

\*\* % HIV-Ab positive and 95% Confidence Interval within each stratum/row.

† Odds ratios are computed within each stratum using prior incarceration as the reference group.

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown Race/Ethnicity: Total Men =690; No. HIV-Ab Positive = 16; % Positive = 2.3

Total Women = 28; No. HIV-Ab Positive = 0; % Positive = 0.0

HIV-Ab = HIV-1 Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay).

Confirmed by IFA (Immunofluorescence Assay) or Western blot when needed.

Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 10**  
**HIV- Ab Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender, Age Group and Incarceration Status, 1994**

Gender and Age Group	Prior Incarceration			No Prior Incarceration			Prior vs No prior incarceration Odds Ratio (95% CI)†
	N (% of column total)	HIV-Ab Positive (% of column total)*	% HIV-Ab Positive within each row (95% CI)**	N (% of column total)	HIV-Ab Positive (% of column total)*	% HIV-Ab Positive within each row (95% CI)**	
<b>MEN</b>							
Under 25	305 (13.6)	1 (1.7)	0.3 (0.02-2.1)	502 (28.6)	9 (22.5)	1.8 (0.9-3.5)	0.2 (0.0-1.3)
25-29	519 (23.1)	16 (28.0)	3.1 (1.8-5.1)	381 (21.7)	11 (27.5)	2.9 (1.5-5.3)	1.1 (0.5-2.5)
30-34	565 (25.2)	14 (24.6)	2.5 (1.4-4.2)	332 (18.9)	8 (20.0)	2.4 (1.1-4.3)	1.0 (0.4-2.7)
35-39	419 (18.7)	12 (21.1)	2.9 (1.6-5.1)	252 (14.3)	5 (12.5)	2.0 (0.7-4.9)	1.5 (0.5-5.3)
>39	436 (19.4)	14 (24.6)	3.2 (1.8-5.5)	290 (16.5)	7 (17.5)	2.4 (1.1-5.1)	1.3 (0.5-3.7)
<b>Sub-Total MEN</b>	<b>2,244 (100)</b>	<b>57 (100)</b>	<b>2.5 (1.9-3.3)</b>	<b>1,757 (100)</b>	<b>40 (100)</b>	<b>2.3 (1.7-3.1)</b>	<b>1.1 (0.7-1.7)</b>
<b>WOMEN</b>							
Under 25	26 (7.4)	0 (0.0)	0.0 (0.0-16.0)	43 (16.0)	0 (0.0)	0.0 (0.0-10.2)	a
25-29	75 (21.4)	1 (8.3)	1.3 (0.07-8.2)	44 (16.4)	0 (0.0)	0.0 (0.0-10.0)	a
30-34	115 (32.9)	5 (41.7)	4.3 (1.6-10.4)	79 (29.5)	5 (71.4)	6.3 (2.4-14.8)	a
35-39	68 (19.4)	6 (50.0)	8.8 (3.6-18.9)	45 (16.8)	0 (0.0)	0.0 (0.0-9.8)	a
>39	66 (18.9)	0 (0.0)	0.0 (0.0-6.9)	57 (21.3)	2 (28.6)	3.5 (0.6-13.2)	a
<b>Sub-Total WOMEN</b>	<b>350 (100)</b>	<b>12 (100)</b>	<b>3.4 (1.9-6.1)</b>	<b>268 (100)</b>	<b>7 (100)</b>	<b>2.6 (1.1-5.5)</b>	<b>1.3 (0.5-3.8)</b>
<b>Total</b>	<b>2,594</b>	<b>69</b>	<b>2.7 (2.1-3.4)</b>	<b>2,025</b>	<b>47</b>	<b>2.3 (1.7-3.1)</b>	<b>1.2 (0.8-1.7)</b>

\* Number HIV-Ab reactive and percent of seropositive within column.

\*\* % HIV-Ab positive and 95% Confidence Interval within each stratum/row.

† Odds ratios are computed within each stratum using prior incarceration as the reference group.

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown Age: Total Men = 510; No. HIV-Ab Positive = 13; % Positive = 2.5. Total Women = 9; No. HIV-Ab Positive = 1; % Positive = 11.1.  
HIV-Ab = HIV-1 Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay).  
Confirmed by IFA (Immunofluorescence Assay) or Western blot when IFA inconclusive.  
Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 11**  
**HBV Exposure<sup>‡</sup> Among Inmates Entering the California Correctional System**  
**By Gender, Race/Ethnicity and Incarceration Status, 1994**

Gender and Race/Ethnicity	Prior Incarceration			No Prior Incarceration			Prior vs No Prior Incarceration Odds Ratio (95% CI) <sup>†</sup>
	N (% of column total)	HBV Ever Exposed (% of column total)*	% HBV Ever Exposed within each row (95% CI)**	N (% of column total)	HBV Ever Exposed (% of column total)*	% HBV Ever Exposed within each row (95% CI)**	
<b>MEN</b>							
White	689 (32.0)	324 (36.3)	47.0 (43.3-50.8)	505 (30.0)	144 (35.6)	28.5 (24.7-32.7)	2.2 (1.7-2.9)
African American	821 (38.2)	304 (34.0)	37.0 (33.7-40.5)	451 (26.8)	98 (24.3)	21.7 (18.1-25.9)	2.1 (1.6-2.8)
Latino	597 (27.7)	239 (26.8)	40.0 (36.1-44.1)	701 (41.7)	153 (37.9)	21.8 (18.9-25.1)	2.4 (1.9-3.1)
Asian/Pacific Islander	10 (0.5)	6 (0.7)	60.0 (27.4-90.7)	8 (0.5)	3 (0.7)	37.5 (10.2-77.5)	2.5 (0.3-25.5)
American Indian/Alaskan Native	35 (1.6)	20 (2.2)	57.1 (39.5-74.2)	16 (1.0)	6 (1.5)	37.5 (16.3-65.8)	2.2 (0.6-8.9)
<b>Sub-Total MEN</b>	<b>2,152 (100)</b>	<b>893 (100)</b>	<b>41.5 (39.4-43.6)</b>	<b>1,681 (100)</b>	<b>404 (100)</b>	<b>24.0 (22.0-26.2)</b>	<b>2.2 (1.9-2.6)</b>
<b>WOMEN</b>							
White	113 (32.8)	69 (35.8)	61.1 (51.4-70.2)	112 (44.1)	42 (42.9)	37.5 (28.7-47.3)	2.6 (1.5-4.7)
African American	139 (40.3)	62 (32.1)	44.6 (36.3-53.4)	72 (28.3)	25 (25.5)	34.7 (24.1-47.2)	1.5 (0.8-2.9)
Latino	83 (24.1)	54 (28.0)	65.1 (53.7-75.3)	62 (24.4)	26 (26.5)	41.9 (29.7-55.4)	2.6 (1.2-5.4)
Asian/Pacific Islander	2 (0.6)	0 (0.0)	0.0 (0.0-80.2)	1 (0.4)	0 (0.0)	0.0 (0.0-94.5)	a
American Indian/Alaskan Native	8 (2.2)	8 (4.1)	100.0 (59.8-113.8)	7 (2.8)	5 (5.1)	71.4 (30.3-102.6)	a
<b>Sub-Total WOMEN</b>	<b>345 (100)</b>	<b>193 (100)</b>	<b>55.9 (50.5-61.3)</b>	<b>254 (100)</b>	<b>98 (100)</b>	<b>38.6 (32.6-44.9)</b>	<b>2.0 (1.4-2.9)</b>
<b>Total</b>	<b>2,497</b>	<b>1,086</b>	<b>43.5 (41.5-45.5)</b>	<b>1,935</b>	<b>502</b>	<b>25.9 (24.0-28.0)</b>	<b>2.2 (1.9-2.5)</b>

\* Number HBsAg or anti-HBc reactive and percent of seropositive within column.

\*\* % HBsAg or anti-HBc positive and 95% Confidence Interval within each stratum/row.

† Odds ratios are computed within each stratum using prior incarceration as the reference group.

‡ HBV exposure encompasses presence of both HBsAg and anti-HBc.

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown Race: Total Men =690; No. HBV Exposure Positive = 243; % Positive = 35.2  
Total Women = 28; No. HBV Exposure Positive = 17; % Positive = 60.7

Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 12**  
**HBV Exposure‡ Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender, Age Group and Incarceration Status, 1994**

Gender and Age Group	Prior Incarceration			No Prior Incarceration			Prior vs No prior incarceration Odds Ratio (95% CI)†
	N (% of column total)	HBV Ever Exposed (% of column total)*	% HBV Ever Exposed within each row (95% CI)**	N (% of column total)	HBV Ever Exposed (% of column total)*	% HBV Ever Exposed within each row (95% CI)**	
<b>MEN</b>							
Under 25	305 (13.6)	41 (4.5)	13.4 (9.9-17.9)	502 (28.6)	50 (11.5)	10.0 (7.5-13.0)	1.4 (0.9-2.2)
25-29	519 (23.1)	133 (14.6)	25.6 (22.0-29.7)	381 (21.7)	68 (15.6)	17.8 (14.2-22.2)	1.6 (1.1-2.2)
30-34	565 (25.2)	228 (25.0)	40.4 (36.3-44.6)	332 (18.9)	93 (21.3)	28.0 (23.3-33.2)	1.7 (1.3-2.4)
35-39	419 (18.7)	233 (25.5)	55.6 (50.7-60.4)	252 (14.3)	90 (20.6)	35.7 (29.9-42.0)	2.3 (1.6-3.2)
>39	436 (19.4)	278 (30.4)	63.8 (59.0-68.3)	290 (16.5)	135 (31.0)	46.6 (40.7-52.5)	2.0 (1.5-2.8)
	<b>2,244 (100)</b>	<b>913 (100)</b>	<b>40.7 (38.6-42.8)</b>	<b>1,757 (100)</b>	<b>436 (100)</b>	<b>24.8 (22.8-26.9)</b>	<b>2.1 (1.8-2.4)</b>
<b>WOMEN</b>							
Under 25	26 (7.4)	15 (7.6)	57.7 (37.2-77.4)	43 (16.0)	7 (6.7)	16.3 (7.3-31.6)	7.0 (2.0-25.5)
25-29	75 (21.4)	36 (18.2)	48.0 (36.4-60.0)	44 (16.4)	10 (9.5)	22.7 (12.0-38.5)	3.1 (1.3-7.9)
30-34	115 (32.9)	59 (29.8)	51.3 (41.9-60.8)	79 (29.5)	29 (27.6)	36.7 (26.4-48.6)	1.8 (1.0-3.4)
35-39	68 (19.4)	49 (24.7)	72.1 (59.7-82.4)	45 (16.8)	25 (23.8)	55.6 (40.1-70.7)	2.1 (0.9-4.9)
>39	66 (18.9)	39 (19.7)	59.1 (46.3-71.2)	57 (21.3)	34 (32.4)	59.6 (45.8-72.7)	1.0 (0.5-2.1)
<b>Sub-Total WOMEN</b>	<b>350 (100)</b>	<b>198 (100)</b>	<b>56.6 (51.2-61.8)</b>	<b>268 (100)</b>	<b>105 (100)</b>	<b>39.2 (33.3-45.4)</b>	<b>2.0 (1.4-2.8)</b>
<b>Total</b>	<b>2,594</b>	<b>1,111</b>	<b>42.8 (40.9-44.8)</b>	<b>2,025</b>	<b>541</b>	<b>26.7 (24.8-28.7)</b>	<b>2.1 (1.8-2.3)</b>

\* Number HBsAg or anti-HBc reactive and percent of seropositive within column.

\*\* % HBsAg or anti-HBc positive and 95% Confidence Interval within each stratum (row).

† Odds ratios are computed within each stratum using prior incarceration as the reference group.

‡ HBV exposure encompasses presence of both HBsAg and anti-HBc.

Note: Missing/Unknown Age: Total Men = 510; No. HBV-Ab Positive = 189; % Positive = 37.1

Total Women = 9; No. HBV-Ab Positive = 5; % Positive = 55.5. Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 13**  
**Anti-HCV‡ Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender , Race/Ethnicity and Incarceration Status, 1994**

Gender and Race/Ethnicity	Prior Incarceration			No Prior Incarceration			Prior vs No Prior Incarceration Odds Ratio (95% CI)†
	N (% of column total)	Anti-HCV Positive (% of column total)*	% Anti-HCV Positive within each row (95% CI)**	N (% of column total)	Anti-HCV Positive (% of column total)*	% anti-HCV Positive within each row (95% CI)**	
<b>MEN</b>							
White	689 (32.0)	416 (39.1)	60.4 (56.6-64.0)	505 (30.0)	176 (38.2)	34.9 (30.7-39.2)	2.9 (2.2-3.6)
African American	821 (38.2)	281 (26.4)	34.2 (31.0-37.6)	451 (26.8)	91 (19.7)	20.2 (16.6-24.3)	2.1 (1.6-2.7)
Latino	597 (27.7)	338 (31.8)	56.6 (52.5-60.6)	701 (41.7)	187 (40.6)	26.7 (23.5-30.2)	3.6 (2.8-4.6)
Asian/Pacific Islander	10 (0.5)	4 (0.4)	40.0 (13.7-75.5)	8 (0.5)	2 (0.4)	25.0 (4.5-66.8)	a
American Indian/Alaskan Native	35 (1.6)	24 (2.3)	68.6 (50.6-83.7)	16 (1.0)	5 (1.1)	31.3 (12.1-59.9)	4.8 (1.2-21.6)
<b>Sub-Total MEN</b>	<b>2,152 (100)</b>	<b>1,063 (100)</b>	<b>49.4 (47.3-51.5)</b>	<b>1,681 (100)</b>	<b>461 (100)</b>	<b>27.4 (25.3-29.6)</b>	<b>2.6 (2.3-3.0)</b>
<b>WOMEN</b>							
White	113 (32.8)	76 (37.1)	67.3 (57.7-75.8)	112 (44.1)	56 (45.5)	50.0 (40.5-59.7)	2.1 (1.2-3.7)
African American	139 (40.3)	56 (27.3)	40.3 (32.2-49.1)	72 (28.3)	24 (19.5)	33.3 (22.9-45.7)	1.4 (0.7-2.6)
Latino	83 (24.1)	65 (31.7)	78.3 (67.6-86.8)	62 (24.4)	37 (30.1)	59.7 (46.4-72.1)	2.4 (1.1-5.4)
Asian/Pacific Islander	2 (0.6)	0 (0.0)	0.0 (0.0-80.2)	1 (0.4)	0 (0.0)	0.0 (0.0-94.5)	a
American Indian/Alaskan Native	8 (2.3)	8 (3.9)	100.0 (59.8-113.8)	7 (2.8)	6 (4.9)	85.7 (42.0-109.7)	a
<b>Sub-Total WOMEN</b>	<b>345 (100)</b>	<b>205 (100)</b>	<b>59.4 (54.0-64.6)</b>	<b>254 (100)</b>	<b>123 (100)</b>	<b>48.4 (42.2-54.8)</b>	<b>1.6 (1.1-2.2)</b>
<b>Total</b>	<b>2,497</b>	<b>1,268</b>	<b>50.8 (48.8-52.8)</b>	<b>1,935</b>	<b>584</b>	<b>30.2 (28.2-32.3)</b>	<b>2.4 (2.1-2.7)</b>

\* Number anti-HCV reactive and percent of seropositive within column..

\*\* % anti-HCV positive and 95% Confidence Interval within each stratum/row.

‡ anti-HCV= Hepatitis C Virus Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay). No confirmatory test performed.

† Odds ratios are computed within each stratum using prior incarceration as the reference group.

a Odds ratios not computed because of too few events for meaningful analysis.

Note: Missing/Unknown Race: Total Men = 690; No. anti-HCV positive = 244; % Positive = 35.4

Total Women = 28; No. anti-HCV positive = 12; % Positive = 42.9

Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 14**  
**Anti-HCV‡ Seroprevalence Among Inmates Entering the California Correctional System**  
**By Gender, Age Group, and Incarceration Status, 1994**

Gender and Age Group	Prior Incarceration			No Prior Incarceration			Prior vs. No Prior Incarceration Odds Ratio (95% CI) †
	N (% of column total)	Anti-HCV Positive (% of column total)*	% Anti-HCV Positive within each row (95% CI)**	N (% of column total)	Anti-HCV Positive (% of column total)*	% anti-HCV Positive within each row (95% CI)**	
<b>MEN</b>							
Under 25	305 (13.6)	59 (5.4)	19.3 (15.2-24.3)	502 (28.6)	34 (7.2)	6.8 (4.8-9.4)	3.3 (2.1-5.3)
25-29	519 (23.1)	193 (17.5)	37.2 (33.0-41.5)	381 (21.7)	99 (21.0)	26.0 (21.7-30.8)	1.7 (1.3-2.3)
30-34	565 (25.2)	272 (24.7)	48.1 (44.0-52.4)	332 (18.9)	107 (22.7)	32.2 (27.3-37.6)	2.0 (1.5-2.6)
35-39	419 (18.7)	267 (24.2)	63.7 (58.9-68.3)	252 (14.3)	110 (23.4)	43.7 (37.5-50.1)	2.3 (1.6-3.2)
>39	436 (19.4)	311 (28.2)	71.3 (66.8-75.5)	290 (16.5)	121 (25.7)	41.7 (36.0-47.7)	3.5 (2.5-4.8)
Sub-Total MEN	<b>2,244 (100)</b>	<b>1,102 (100)</b>	<b>49.1 (47.0-51.2)</b>	<b>1,757 (100)</b>	<b>471 (100)</b>	<b>26.8 (24.8-28.9)</b>	<b>2.6 (2.3-3.0)</b>
<b>WOMEN</b>							
Under 25	26 (7.4)	14 (6.7)	53.8 (33.7-74.1)	43 (16.0)	11 (8.5)	25.6 (14.0-41.8)	3.4 (1.1-10.9)
25-29	75 (21.4)	34 (16.3)	45.3 (33.9-57.5)	44 (16.4)	18 (14.0)	40.9 (26.7-57.2)	1.2 (0.5-2.7)
30-34	115 (32.9)	64 (30.6)	55.7 (46.1-65.0)	79 (29.5)	39 (30.2)	49.4 (38.0-61.0)	1.3 (0.7-2.4)
35-39	68 (19.4)	51 (24.4)	75.0 (62.8-84.9)	45 (16.8)	25 (19.4)	55.6 (40.1-70.7)	2.4 (1.0-5.8)
>39	66 (18.9)	46 (22.0)	69.7 (57.0-80.6)	57 (21.3)	36 (27.9)	63.2 (49.3-75.8)	1.3 (0.6-3.1)
Sub-Total WOMEN	<b>350 (100)</b>	<b>209 (100)</b>	<b>59.7 (54.4-64.9)</b>	<b>268 (100)</b>	<b>129 (100)</b>	<b>48.1 (42.0-54.3)</b>	<b>1.6 (1.1-2.2)</b>
<b>Total</b>	<b>2,594</b>	<b>1,311</b>	<b>50.5 (48.6-52.5)</b>	<b>2,025</b>	<b>600</b>	<b>29.6 (27.7-31.7)</b>	<b>2.4 (2.1-2.8)</b>

\* Number anti-HCV positive and percent of seropositive within column.

\*\* % anti-HCV positive and 95% Confidence Interval within each stratum/row.

‡ anti-HCV= Hepatitis C Virus Antibodies detected using EIA (Enzyme-Linked Immunosorbent Assay). No confirmatory test performed.

† Odds ratios are computed within each stratum using prior incarceration as the reference group.

Note: Missing/Unknown Age: Total Men = 510; No. anti-HCV positive = 195; % positive = 38.3

Total Women = 9; No. anti-HCV positive = 2; % positive = 22.2.

Percents are rounded independently and may not sum to 100%.

Source: California Department of Health Services, Office of AIDS, 1996

**Table 15**  
**Viral Hepatitis Serology in relation to HIV Status**  
**Among Inmates Entering the California Correctional System**  
**1994**

Hepatitis Serology	Male				Female			
	HIV + (N=106)		HIV - (N=4210)		HIV + (N=20)		HIV - (N=602)	
	N	(%)	N	(%)	N	(%)	N	(%)
None	23	(21.7)	2238	(53.2)	2	(10.0)	220	(36.5)
HBsAg*	2	(1.9)	34	(0.8)	1	(5.0)	3	(0.8)
anti-HBc**	16	(15.1)	270	(5.2)	0	(0.0)	55	(14.4)
anti-HCV‡	13	(12.3)	619	(14.7)	4	(20.0)	94	(24.6)
HBsAg + anti-HCV	1	(0.9)	51	(1.2)	0	(0.0)	7	(1.8)
anti-HBc + anti-HCV	47	(44.3)	943	(22.4)	13	(65.0)	221	(57.9)
anti-HBc+ HBsAg + anti-HCV	4	(3.8)	55	(1.3)	0	(0.0)	2	(0.5)

\* HBsAg entails presence of hepatitis B virus surface antigens.

\*\* anti-HBc entails presence of hepatitis B virus core antibodies.

‡ anti-HCV entails presence of antibodies to hepatitis C virus.

Source: California Department of Health Services, Office of AIDS, 1996

Appendix 1  
**SEROPREVALENCE DATA FROM HIV ANTIBODY TESTING OF INMATES  
 IN BLINDED EPIDEMIOLOGIC STUDIES<sup>17</sup>**

Correctional System	Dates	Number Tested	Number Seropositive	% Seropositive
Arkansas	7/90	698 M	6 M	0.9% M
		23 F	0 F	0.0 F
	2/92-11/92	1,500 M	8 M	0.5 M
		300 F	3 F	1.0 F
California	4/88-5/88 <sup>b</sup>	5,372 M	137 M	2.6 M
		(All incoming) 807 F	25 F	3.1 F
	1988	1,000 M+F	69 M+F	6.9 M+F
Hawaii	1/88-10/90	2,327 M	22 M	0.9 M
		142 F	0 F	0.0 F
	3/88-3/92	F 3,010 M	33 M	1.1 M
		273 F	0 F	0.0 F
Illinois <sup>c</sup>	1988	808 M	27	3.3 M
		4/89-6/89	501 M M	20 M
	1/91-12/91	989 M	41 M	4.1 M
		880 F	50 F	5.7 F
Louisiana	1/90-12/91	2,000 M	6 M	0.3 M
Massachusetts	1/92-6/92	1,890 M	137 M	7.2 M
		306 F	40 F	13.1 F
New Jersey	9/91-10/91	1,100 M	99 M	9.0 M
		100 F	15 F	15.0 F
New York (State)	12/87-1/88 <sup>d</sup>	494 M	84 M	17.0 M
		1990	563 M	84 M
	1992 <sup>e</sup>	2,532 M	292 M	11.5 M
	8/88-12/88	480 F	90 F	18.8 F
		1992-93 <sup>e</sup>	872 F	177 F
North Carolina	11/89-4/90	7942 M	238 M	3.0 F
		784 F	36 F	4.6 F
Oregon	9/90-10/90	437 M	4 M	0.9 F
		76 F	0 F	0.0 F
	9/90-6/92	2,035 M	23 M	1.1 F
		853 F	6 F	0.7 F
South Carolina <sup>f</sup>	4/88-6/88	457 M	8 M	1.7 M
		3 F	0 F	0.0 F
Tennessee	7/88-8/90	4,461 M	52 M	1.2 F
		448 F	1 F	0.2 F
Texas	9/89-10/89	1,226 M	30M+F	2.4
	10/90-	986 F	26 M	M+F
	12/90			2.6 M
Virginia <sup>g</sup>	6/89-8/89	1,287 M	30 M	2.3 M
Washington	8/87-1/88	796 M	5 M	0.6 M
		3/91-5/91	500 M	1 M
Wisconsin <sup>h</sup>	1/88-8/88	1,621 M	9 M	0.6 M
Maricopa County (Phoenix), Arizona	6/89-11/89	813 M	28 M	3.4 M
Los Angeles County, California	10/90	400 M	11 M	2.8 M
		100 F	1 F	1.0 F
Santa Clara County, California	10/86-10/89	348 F	6 F	1.7 F
Quebec, Canada	12/87-10/90	520 M	44 M	8.5 M
		248 F	19 F	7.7 F

Appendix 1(Continued)  
**SEROPREVALENCE DATA FROM HIV ANTIBODY TESTING OF INMATES  
 IN BLINDED EPIDEMIOLOGIC STUDIES<sup>17</sup>**

Correctional System	Dates	Number Tested	Number Seropositive	% Seropositive
Fulton County (Atlanta), Georgia	7/88-12/88	160 M 40 F	11 M 3 F	6.9 M 7.5 F
Cook County, Illinois	11/89-12/89	372 M 100 F	23 M 8 F	6.2 M 8.0 F
New York City, New York	9/89 1/91-2/91	1,690 M 546 F 2,061 M 519 F	272 M 140 F 262 M 116 F	16.1 M 25.6 F 12.7 M 22.4 F
King County (Seattle), Washington	9/90-12/91	214 M 24 F	9 M 1 F	4.2 M 4.2 F

<sup>a</sup>These studies were anonymous (not identify-linked) and conducted to determine seroprevalence rates in a population. Several systems did not specify the inmate category (for example, all incoming) tested in their study.

<sup>b</sup>J.A. Singleton et al., "HIV Seroprevalence Among Prisoners Entering the California Correctional System," California Department of Health Services, January 1989.

<sup>c</sup>Illinois Department of Corrections and Abt. Associates Inc., unpublished data.

<sup>d</sup>B.I. Truman et al., "HIV Seroprevalence and Risk Factors Among Prison Inmates Entering New York State Prisons," Presented at 4th International AIDS Conference, Stockholm. June 1988.

<sup>e</sup>J. Mikl, P.F. Smith, R.B. Greifinger, "HIV Seroprevalence Among New York State Prison Inmates Entering the Bedford Hills, Downstate, and Ulster Correctional Facilities. August 1992-February 1993," Presented at IX International Conference on AIDS, Berlin, June 1993.

<sup>f</sup>M.C. Monroe et al., "Studies of HIV Seroprevalence and AIDS Knowledge, Attitudes and Risk Behaviors in Inmates in the South Carolina Department of Corrections, 1988," October 1989.

<sup>g</sup>Commonwealth of Virginia. Department of Corrections. "HIV Seropositivity Study," October 1989.

<sup>h</sup>Wisconsin AIDS/HIV Program, Wisconsin Department of Health and Social Services. "HIV Seroprevalence and the Acceptance of Voluntary HIV Testing Among Newly Incarcerated Male Prison Inmates in Wisconsin," May 1989.

# Appendix 2 Data Collection Instrument

## CORRECTIONAL FACILITY SEROPREVALENCE SURVEY

SURVEY NUMBER

F1 0032851 8

PROJECT		DATE		RESIDENCE				SEX	AGE
AREA	SITE	MONTH	YEAR	STATE	COUNTY	ZIP CODE			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
① ①	① ①	① Jan	⑧9	① ①	① ① ①	① ① ① ① ①	①	① Under 15	
① ①	① ①	② Feb	⑧0	① ①	① ① ①	① ① ① ① ①	Male	② 15 - 19	
② ②	② ②	③ Mar	⑧1	② ②	② ② ②	② ② ② ② ②	①	③ 20 - 24	
③ ③	③ ③	④ Apr	⑧2	③ ③	③ ③ ③	③ ③ ③ ③ ③		④ 25 - 29	
④ ④	④ ④	⑤ May	⑧3	④ ④	④ ④ ④	④ ④ ④ ④ ④		⑤ 30 - 34	
⑤ ⑤	⑤ ⑤	⑥ Jun	⑧4	⑤ ⑤	⑤ ⑤ ⑤	⑤ ⑤ ⑤ ⑤ ⑤		⑥ 35 - 39	
⑥ ⑥	⑥ ⑥	⑦ Jul	⑧5	⑥ ⑥	⑥ ⑥ ⑥	⑥ ⑥ ⑥ ⑥ ⑥	Female	⑦ 40 - 44	
⑦ ⑦	⑦ ⑦	⑧ Aug	⑧6	⑦ ⑦	⑦ ⑦ ⑦	⑦ ⑦ ⑦ ⑦ ⑦	②	⑧ 45 +	
⑧ ⑧	⑧ ⑧	⑨ Sep	⑧7	⑧ ⑧	⑧ ⑧ ⑧	⑧ ⑧ ⑧ ⑧ ⑧			
⑨ ⑨	⑨ ⑨	⑩ Oct	⑧8	⑨ ⑨	⑨ ⑨ ⑨	⑨ ⑨ ⑨ ⑨ ⑨			
		⑪ Nov							
		⑫ Dec							

**DO NOT MARK  
IN THIS AREA**

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
①	②	④	⑧
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
①	②	④	⑧
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
①	②	④	⑧
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
①	②	④	⑧
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
①	②	④	⑧
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
①	②	④	⑧

**RACE/ETHNICITY**

- 
- ① White
  - ② Black
  - ③ Hispanic \*
  - ④ Asian/Pacific Islander
  - ⑤ American Indian/Alaskan Native
  - ⑧ Other

\* IF HISPANIC, SPECIFY:

- 
- ① Mexican/Mexican American
  - ② Puerto Rican
  - ③ Cuban
  - ⑧ Other

**RISK EXPOSURES  
(MARK ALL THAT APPLY)**

- Man who had sex only with men
- Man who had sex with men and women
- Used IV drugs since 1978
- Person with hemophilia
- Female sex partner of bisexual man
- Sex partner of person with HIV/AIDS
- Sex partner of IV drug user
- Sex partner of person with hemophilia
- Received blood/products 1979-1985
- Heterosexual
- Received money/drugs for sex
- Gave money/drugs for sex
- No information available

**PREVIOUSLY INCARCERATED**

- 
- ① No
  - ① Yes
  - ⑨ Unknown

**VDRL/STS/RPR**

- 
- ① Non-reactive
  - ① Reactive
  - ⑨ Not available

**BLOOD SAMPLE OBTAINED**

- 
- ① No
  - ① Yes

**LOCAL USE ONLY**

A	B	C	D	E	F	G	H	I	J
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
①	①	①	①	①	①	①	①	①	①
②	②	②	②	②	②	②	②	②	②
③	③	③	③	③	③	③	③	③	③
④	④	④	④	④	④	④	④	④	④
⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨	⑨	⑨	⑨	⑨	⑨

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