Characteristics and Trends of Newly Identified HIV Infections Among Incarcerated Populations: CDC HIV Voluntary Counseling, Testing, and Referral System, 1992–1998

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ABSTRACT *Inmate contact with the correctional health care system provides public health professionals an opportunity to offer HIV screening to a population that might prove difficult to reach otherwise. We report on publicly funded human immunodeficiency virus (HIV) voluntary counseling, testing, and referral (VCTR) services provided to incarcerated persons in the United States. Incarcerated persons seeking VCTR services received pretest counseling and gave a blood specimen for HIV antibody testing. Specimens were considered positive if the enzyme immunoassays were repeatedly reactive and the Western blot or immunofluorescent assay was reactive. Demographics, HIV risk information, and laboratory test results were collected from each test episode. Additional counseling sessions provided more data. From 1992 to 1998, there were 527,937 records available from correctional facilities from 48 project areas; 484,277 records included a test result and 459,155 (87.0%) tests came with complete data. Overall, 3.4% (16,797) of all tests were reactive for HIV antibodies. Of reactive tests accompanied by self-reports of previous HIV test results (15,888), previous test results were 44% positive, 23% negative, 6% inconclusive or unspecified, and 27% no previous test. This indicates that 56% of positive tests were newly identified. During the study period, the number of tests per year increased three-fold. Testing increased among all racial/ethnic groups and both sexes. The largest increase was for heterosexuals who reported no other risk, followed by persons with a sex partner at risk. Overall, the greatest number of tests was reported for injection drug users (IDUs) (128,262), followed by men who have sex with men (MSM) (19,928); however, episodes for MSM doubled during the study, while for IDUs, they increased 74%. The absolute number of HIV-positive (HIV+) tests increased 50%; however, the percentage of all tests that were HIV+ decreased nearly 50% due to the increased number of tests performed. HIV+ tests fell 50% among blacks (7.6% to 3.7%), Hispanics (6.7% to 2.5%), and males (5.1% to 2.5%); 33% among females (4.5% to 3.1%); 95% among IDUs (8.6% to 4.4%); and 64% among MSM (19.3% to 11.8%). Among HIV+ episodes, those for IDUs dropped from 61.5% to 36.6%, while episodes for heterosexuals with no reported risk factor increased from 4.3% to 18.2%. The use of VCTR services by incarcerated persons rose steadily from 1992 to 1998, and 56% of HIV+ tests were newly identified. High numbers of tests that recorded risk behaviors for*

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contracting HIV indicate that correctional facilities provide an important access point for prevention efforts.

KEYWORDS *Correctional Facilities, Counseling and Testing, HIV.*

INTRODUCTION

The National Institute of Justice¹ reported that nearly 1.9 million persons were incarcerated in the United States at midyear 1999. Even more have passed through the corrections system in the past year. Incarcerated populations contain substantial numbers of persons who are at risk for human immunodeficiency virus (HIV) infection.

The 1996 National Household Survey on Drug Abuse found that 1.6% of the US population aged 18–59 years had injected illicit drugs at least once.² Yet, over 70% of federal prison inmates and 80% of state prison and local jail inmates reported a history of drug use, 17% of whom were injecting and many of whom had limited access to health care.^{3–5} High numbers (75%) of injection drug users (IDUs) spend some time in correctional facilities.^{6,7} Correctional facilities provide a unique opportunity to reach underserved populations from communities of low socioeconomic status with public health prevention services.

Inmates of correctional facilities are disproportionately members of minority racial and ethnic groups. Through the 1990s, blacks made up about 13% of the US population and Hispanics about 11%, but they constituted 45% and 18% of the incarcerated population, respectively.^{8,9} Similarly, men account for 84% of the incarcerated population, compared to 49% of the general population.

There is an estimated 0.39% prevalence of HIV infection in the general US population.¹⁰ The national prevalence of HIV infection among men is estimated at 0.6%, including 2% of non-Hispanic black men and 1% of Hispanic men; 0.1% of women are estimated to be HIV infected, including 0.6% of non-Hispanic black women.¹⁰ Approximately half of all infected persons identified in national studies between 1984 and 1992 were men who had sex with men (MSM), and one fourth were IDUs.¹⁰ Overall, a survey of correctional facilities found the prevalence of HIV infection in 1996 was 2.3% among persons incarcerated in state prisons and 4.6% among incarcerated IDUs.⁵ Other studies have found even higher rates among inmates.^{5,11} The highest infection rates in correctional facilities have been found among racial/ethnic minorities (range 4%–10%) and women (range 2%–7%).^{11–16}

In response to these issues, the Centers for Disease Control and Prevention (CDC) funds HIV voluntary counseling, testing, and referral (VCTR) services provided by states and local health departments as part of a comprehensive HIV prevention program, which may include provision of services to inmates of correctional facilities. The results of mandatory HIV testing, required by some correctional facilities, are not reported to the CDC Counseling and Testing System.

Benefits accrue to persons who receive HIV VCTR. Client-centered counseling that focuses on personal risk reduction can reduce risky behaviors and new sexually transmitted infections for persons at increased risk for HIV.¹⁷ When individuals know their HIV status, they may be more likely to take measures that protect partners and become less likely to transmit the virus.^{18,19} Individuals may benefit from earlier antiretroviral treatment and also may be less likely to transmit HIV.¹⁹ Effective treatment reduces HIV-related illness and death among infected persons. Referral linkages to medical, prevention, and social support services have been developed to help clients access services that may help them initiate and sustain behav-

ioral changes that reduce the risk of acquiring or transmitting HIV and increase the likelihood of a healthy quality of life.^{20,21}

This report summarizes data on newly identified HIV-positive (HIV+) test episodes reported from HIV counseling and testing sites in prison settings between 1992 and 1998.

METHODS

The HIV Counseling and Testing System database contains information from each reported HIV VCTR episode at a CDC-funded site. Informed consent is obtained for each episode. A description of the database has been published elsewhere.^{22,23}

All CDC-funded HIV antibody tests reported from correctional facilities between 1992 and 1998 were included in this study. The following states and localities and their corresponding regions (NE, Northeast; MW, Midwest; S, South; W, West) were included: Alabama (S), Arizona (W), California (W), Chicago (MW), Colorado (W), Connecticut (NE), Delaware (S), Florida (S), Georgia (S), Houston (S), Illinois (MW), Indiana (MW), Kentucky (S), Los Angeles (W), Louisiana (S), Maryland (S), Massachusetts (NE), Michigan (MW), Minnesota (MW), Missouri (MW), Montana (W), Nebraska (MW), Nevada (W), New Hampshire (NE), New Jersey (NE), New Mexico (W), New York (NE), New York City (NE), North Carolina (S), North Dakota (MW), Ohio (MW), Oklahoma (S), Oregon (W), Pennsylvania (NE), Philadelphia (NE), Puerto Rico, Rhode Island (NE), San Francisco (W), Tennessee (S), Texas (S), Utah (W), Virginia (S), Virgin Islands, Washington (Seattle only) (W), Washington DC (S), Wisconsin (MW), Wyoming (W).

All demographic, risk factor, and previous testing history information were self-reported by the client during a counseling session. Identifying information was not collected, so multiple tests cannot be linked to an individual. Laboratory test results (repeatedly reactive enzyme immunoassays and confirmatory Western blots or immunofluorescent assays) were added to the system. HIV counselors record all risk behaviors that an individual client reports. Therefore, multiple risk behaviors for a client may be reported from a single testing episode. However, a single risk behavior (except for the combination of MSM and injection of illicit drugs) was assigned for each testing episode using a standard hierarchy.²² Persons who reported heterosexual activity of any kind were aggregated into a category "heterosexual risk behaviors."

Self-report of previous test results was used to determine newly identified HIV+ tests. Newly identified HIV+ tests were events with positive current test results for which the previous test results were reported to be negative, unknown, inconclusive, or not done. Tests were classified as HIV negative, previously known to be HIV+, or newly identified HIV+. Reports from Minnesota did not include self-report of previous test results (N = 52 tests).

RESULTS

General Characteristics

A total of 527,937 VCTR episodes was reported in correctional facilities between 1992 and 1998. Of these, 489,819 (92.8%) reports included HIV test results, 494,868 (93.7%) included self-reported previous test results, and 459,155 (87.0%) included both. The following analyses used only the last, complete records. Records

excluded from the analysis do not differ appreciably from those included. Overall, 3.4% of all tests were positive for HIV antibodies, 12% of tests were anonymous, and 86% of negative tests and 89% of positive tests reported complete posttest counseling. Among all test episodes, the testers were 40% black, 35% white, 22% Hispanic; 75% were male; and 48% were over 30 years old (see Table 1). The most frequently mentioned risk category in the population was heterosexual risk behaviors (64%), followed by IDU (25%) and MSM (2.8%).

Among positive test records, 3,724 (23%) included reports of a previous negative test, 837 (5%) did not include their previous test results, and 125 (0.7%) included a report of a previous inconclusive test. There were 7,033 (44%) who reported a previous positive test. The greatest numbers of positive HIV test results were for those reporting heterosexual risk behaviors (40%) and heterosexual IDU (39%). Of positive tests, 11% were MSM, and another 5% were identified as MSM/IDU.

Among newly identified HIV+ test records (N = 8,855), 59% specified they were black, 22% specified Hispanic, and 17% specified white; 73% specified male; and 65% specified over 30 years of age.

The greatest number of tests was reported from the South, followed by the Northeast and the West. The age and sex distribution among tests identifying infections for the first time among IDUs was 78% over the age of 30 years and 73% male, respectively; among MSM, 60% were over 30 years old; and for persons with heterosexual risk behaviors, 63% were over the age of 30, and 64% were male. The race distribution among newly identified HIV+ tests from IDUs was 46% black, 27% Hispanic, and 25% white; among MSM, it was 53% black, 29% white, and 16% Hispanic; and among tests for individuals with heterosexual risk behaviors specified, it was 68% black, 17% Hispanic, and 13% white.

Among IDUs, the Northeast had the greatest number of newly identified HIV+ tests, although it had only the second largest number of overall tests reported. The South had the second largest number of newly identified HIV+ tests with the largest number of tests. Among MSM, the greatest numbers were tested in the South, and the most newly identified infections came from there. The West was second in newly identified HIV+ tests, but third in number of tests. Among test records with heterosexual risk behaviors specified, again the greatest numbers were tested in the South, and the most newly identified HIV+ tests came from there. The Northeast was second in both number of tests and number of newly identified HIV+ test records with heterosexual risk behaviors specified.

Overall, 3.2% of tests from men and 3.7% of tests from women were HIV+. The highest seropositive test rates were found among Hispanic women (4.8%), black men (4.7%), and black women (5.0%). The rates were lower among Hispanic men (2.9%), white men (1.7%), and white women (2.1%).

Trends

The overall number of HIV VCTR tests offered in correctional facilities increased 194%, from 33,711 to 99,250, from 1992 to 1998. The proportion of tests from heterosexual IDUs decreased between 1992 and 1998 (36.6% to 24.1%), although the absolute number increased (12,361 to 23,922). This was partly attributable to the increase in the number of tests from heterosexuals who reported no other risk factors, from 18,082 (53.6%) to 67,483 (68.0%). The proportion of tests from MSM declined slightly over the study period, from 5.2% to 3.9%.

Overall, the total number of positive HIV tests among men rose 1.4 times,

TABLE 1. Demographic and risk characteristics from HIV counseling and testing by number of tests, newly identified HIV-positive tests, and previously known HIV+ infections, 1992–1998

Trait	Number of tests (n = 459,155)		Newly identified HIV+ (n = 8,855)		Previously known HIV+ infections (n = 7,033)	
	No.	%	No.	%	No.	%
Sex						
Male	344,085	74.9	6,427	72.6	5,045	71.7
Female	113,494	24.7	2,372	26.8	1,970	28.0
Missing	1,576	0.3	56	0.6	18	0.3
Race						
White	161,261	35.1	1,538	17.4	1,612	23.0
Black	182,998	39.9	5,212	58.9	3,825	54.5
Hispanic	102,319	22.3	1,936	21.9	1,499	21.4
Asian/Pacific Islanders	2,589	0.6	19	0.2	11	0.2
American Indian/Native Alaskan	3,578	0.8	32	0.4	19	0.3
Other/unknown	5,044	1.1	98	1.1	55	0.8
Age, years						
<13	386	0.1	1	<0.1	2	<0.1
13–19	61,235	13.3	205	2.3	68	1.0
20–29	173,491	37.8	2,815	31.8	1,717	24.5
30–39	156,782	34.1	4,137	46.7	3,452	49.2
40–49	54,802	11.9	1,442	16.3	1,568	22.3
50+	10,453	2.3	204	2.3	182	2.6
Unknown	1,712	0.4	40	0.5	32	0.5
Risk						
MSM/IDU	5,791	1.3	408	4.6	421	6.0
MSM	13,041	2.8	863	9.7	894	12.7
Heterosexual IDU	115,545	25.2	3,289	37.1	2,849	40.5
Heterosexual behavioral risk	294,297	64.1	3,861	43.6	2,514	35.7
Other/not stated	30,481	6.6	434	4.9	355	5.0
Region						
Northeast	131,365	28.6	2,732	30.9	1,836	26.1
Midwest	24,746	5.4	663	7.5	677	9.6
South	199,433	43.4	3,885	43.9	3,272	46.5
West	85,403	18.6	978	11.0	550	7.8
Puerto Rico/Virgin Islands	18,207	4.0	597	6.7	698	9.9
Year						
1992	33,711	7.3	1,152	13.0	622	8.8
1993	44,993	9.8	1,173	13.2	651	9.3
1994	50,968	11.1	1,143	12.9	692	9.8
1995	64,941	14.1	1,329	15.0	805	11.4
1996	80,891	17.6	1,393	15.7	1,155	16.4
1997	84,401	18.4	1,307	14.8	1,685	24.0
1998	99,250	21.6	1,358	15.3	1,423	20.2

IDU, injection drug user; MSM, men who have sex with men.

while tests among women increased four-fold. Positive HIV tests were reported as follows in 1992 and 1998, respectively: IDUs, from 1,060 (53%) to 956 (33%); heterosexual risk behaviors, from 481 (24%) to 1,299 (45%); MSM, from 224 (11%) to 347 (12%); and MSM/IDU, from 167 (8%) to 126 (4%).

During the same time period, the number of newly identified HIV+ tests increased 17% (1,145 to 1,335). Between 1992 and 1998, the greatest increases in newly identified HIV+ tests, regardless of reported risk, were seen in the West (up 253%) and South (up 85%). Other regions saw a decrease in newly identified HIV+ tests (see Table 2). Newly identified HIV+ tests increased 2% among men (Table 3)

TABLE 2. Newly identified HIV infections from HIV counseling and testing in correctional facilities

	1992 (n = 1145)		1993 (n = 1168)		1994 (n = 1141)		1995 (n = 1325)		1996 (n = 1388)		1997 (n = 1297)		1998 (n = 1335)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Age group, years														
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0
13–19	22	1.9	25	2.1	20	1.8	36	2.7	38	2.7	21	1.6	43	3.2
20–29	437	38.1	439	37.6	376	33.0	429	32.3	385	27.6	388	29.7	361	26.6
30–39	524	45.7	525	44.9	550	48.2	610	45.9	695	49.9	614	47.0	619	45.6
40–49	145	12.6	159	13.6	165	14.5	220	16.6	238	17.1	235	18.0	280	20.6
≥50	14	1.2	20	1.7	23	2.0	27	2.0	31	2.2	43	3.3	46	3.4
Unknown	5	0.4	1	0.1	7	0.6	7	0.5	6	0.4	5	0.4	9	0.7
Transmission mode														
MSM/IDU	87	7.6	85	7.2	45	3.9	57	4.3	48	3.4	39	3.0	47	3.5
MSM	110	9.5	117	10.0	121	10.6	134	10.1	102	7.3	111	8.5	168	12.4
Heterosexual IDU	627	54.4	562	47.9	387	33.9	440	33.1	452	32.4	415	31.8	406	29.9
Sexual activity	311	27.0	368	31.4	552	48.3	614	46.2	675	48.5	687	52.6	654	48.2
Other/not stated	17	1.5	41	3.5	38	3.3	84	6.3	116	8.3	55	4.2	83	6.1
Race/ethnicity														
White	203	17.7	219	18.7	177	15.5	234	17.6	236	17.0	221	16.9	248	18.3
Black	573	50.0	603	51.5	725	63.5	835	63.0	876	63.1	815	62.5	785	57.8
Hispanic	364	31.8	333	28.4	225	19.7	235	17.7	252	18.2	246	18.9	281	20.7
Asian/Pacific														
Islander	0	0.0	5	0.4	1	0.1	1	0.1	3	0.2	4	0.3	5	0.4
American Indian/ Native Alaskan	4	0.3	2	0.2	6	0.5	4	0.3	5	0.4	2	0.2	9	0.7
Other	2	0.2	7	0.6	3	0.3	5	0.4	6	0.4	10	0.8	6	0.4
Undetermined	0	0.0	2	0.2	4	0.4	12	0.9	10	0.7	7	0.5	24	1.8
Sex														
Male	920	80.3	926	79.3	824	72.2	939	70.9	976	70.3	902	69.5	940	70.4
Female	225	19.7	242	20.7	317	27.8	386	29.1	412	29.7	395	30.5	395	29.6
Region														
Northeast	475	41.2	384	32.7	433	37.9	418	31.5	393	28.2	333	25.5	296	21.8
Midwest	144	12.5	97	8.3	78	6.8	91	6.8	66	4.7	92	7.0	95	7.0
South	310	26.9	443	37.8	553	48.4	663	49.9	711	51.0	630	48.2	575	42.3
West	83	7.2	100	8.5	71	6.2	129	9.7	149	10.7	153	11.7	293	21.6
Puerto Rico/Virgin Islands	140	12.2	149	12.7	8	0.7	28	2.1	74	5.3	99	7.6	99	7.3

IDU, injection drug user; MSM, men who have sex with men.

TABLE 3. Newly identified HIV infections among incarcerated males

	1992 (n = 920)		1993 (n = 926)		1994 (n = 824)		1995 (n = 939)		1996 (n = 976)		1997 (n = 902)		1998 (n = 940)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Age group, years														
<5	0	0.0	0	0.0	2	0.3	0	0.0	0	0.0	1	0.1	0	0.0
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13–19	18	2.0	14	1.5	14	1.7	26	2.8	28	2.9	17	1.9	32	3.4
20–29	340	37.1	333	36.1	250	30.4	296	31.5	255	26.1	259	28.7	239	25.4
30–39	419	45.7	418	45.3	408	49.6	431	45.9	476	48.8	412	45.7	420	44.7
40–49	124	13.5	137	14.9	126	15.3	164	17.5	189	19.4	173	19.2	212	22.6
≥50	12	1.3	19	2.1	19	2.3	20	2.1	24	2.5	37	4.1	32	3.4
Unknown	4	0.4	1	0.1	6	0.7	2	0.2	4	0.4	4	0.4	5	0.5
Mode of transmission														
MSM/IDU	87	9.5	85	9.2	45	5.5	57	6.1	48	4.9	39	4.3	47	5.0
MSM	110	12.0	117	12.6	121	14.7	134	14.3	102	10.5	111	12.3	168	17.9
Heterosexual IDU	475	51.6	424	45.8	270	32.8	294	31.3	307	31.5	275	30.5	257	27.3
Sexual activity	234	25.4	269	29.0	364	44.2	391	41.6	429	44.0	443	49.1	420	44.7
Other/not stated	14	1.5	31	3.3	24	2.9	63	6.7	90	9.2	34	3.8	48	5.1
Race/Ethnicity														
White	145	15.8	153	16.5	114	13.9	134	14.3	128	13.2	127	14.1	161	17.1
Black	455	49.6	468	50.6	520	63.2	611	65.1	661	67.9	580	64.4	556	59.1
Hispanic	313	34.1	295	31.9	179	21.7	177	18.9	169	17.4	182	20.2	206	21.9
Asian/Pacific Islander	0	0.0	3	0.3	0.0	0.0	1	0.1	0	0.0	2	0.2	4	0.4
American Indian/ Native Alaskan	3	0.3	1	0.1	4	0.5	3	0.3	4	0.4	0	0.0	7	0.7
Other	2	0.2	3	0.3	3	0.4	4	0.4	3	0.3	7	0.8	5	0.5
Undetermined	0	0.0	2	0.2	3	0.4	8	0.9	8	0.8	3	0.3	1	0.1
Region														
Northeast	402	43.7	302	32.6	322	39.1	304	32.4	272	27.9	213	23.6	203	21.6
Midwest	127	13.8	93	10.0	70	8.5	73	7.8	57	5.8	78	8.6	76	8.1
South	219	23.8	321	34.7	375	45.5	465	49.5	521	53.4	439	48.7	399	42.4
West	50	5.4	69	7.5	49	5.9	80	8.5	90	9.2	106	11.8	207	22.0
Puerto Rico/Virgin Islands	122	13.3	141	15.2	8	1.0	17	1.8	36	3.7	66	7.3	55	5.9

IDU, injection drug user; MSM, men who have sex with men.

and 76% among women (Table 4). Overall, the greatest increases in newly identified HIV+ tests were among persons reporting heterosexual risk behaviors (see Tables 5 and 6). Newly identified HIV+ tests among white women with heterosexual risk behaviors increased 356%, followed by Hispanic women (309%), and black women (154%); newly identified HIV+ tests among white men increased 117%, followed by black men (95%) and Hispanic men (28%). Newly identified HIV+ tests among women aged 30–39 years increased 276%, and they increased 300% among women aged 40–49 years. HIV+ tests among persons reporting heterosexual risk behaviors increased in all regions: 294% in the West, 201% in the South, 116% in Puerto Rico/Virgin Islands, 37% in the Northeast, and 12% in the Midwest (see Tables 5 and 6).

TABLE 4. Newly identified HIV infections among incarcerated females

	1992 (n = 225)		1993 (n = 242)		1994 (n = 317)		1995 (n = 386)		1996 (n = 412)		1997 (n = 395)		1998 (n = 395)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Age group, years														
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0
13–19	4	1.8	10	4.1	6	1.9	10	2.6	10	2.4	4	1.0	9	2.3
20–29	91	40.6	103	42.6	126	39.7	130	33.7	129	31.3	125	31.6	116	29.4
30–39	105	46.9	106	43.8	142	44.8	179	46.4	217	52.7	200	50.6	188	47.6
40–49	21	9.4	22	9.1	38	12.0	55	14.2	48	11.7	59	14.9	66	16.7
≥50	2	0.9	1	0.4	4	1.3	7	1.8	7	1.7	6	1.5	12	3.0
Unknown	1	0.4	0	0.0	1	0.3	5	1.3	1	0.2	0	0.0	4	1.0
Mode of transmission														
Heterosexual IDU	147	65.3	136	56.2	116	36.6	143	37.0	142	34.5	136	34.4	149	37.7
Sexual activity	77	34.2	98	40.5	187	59.0	222	57.5	244	59.2	243	61.5	234	59.2
Other/not stated	1	0.4	8	3.3	14	4.4	21	5.4	26	6.3	16	4.1	12	3.0
Race/Ethnicity														
White	56	25.0	65	27.0	63	19.9	99	25.6	107	26.1	92	23.3	87	22.0
Black	117	52.2	133	55.2	204	64.4	224	58.0	214	52.2	232	58.7	228	57.7
Hispanic	50	22.3	37	15.4	46	14.5	58	15.0	83	20.2	63	15.9	75	19.0
Asian/Pacific														
Islander	0	0.0	2	0.8	1	0.3	0	0.0	1	0.2	2	0.5	1	0.3
American Indian/ Native Alaskan	1	0.4	1	0.4	2	0.6	1	0.3	1	0.2	1	0.3	2	0.5
Other	0	0.0	3	1.2	0	0.0	1	0.3	2	0.5	3	0.8	1	0.3
Undetermined	0	0.0	0	0.0	1	0.3	3	0.8	2	0.5	2	0.5	1	0.3
Region														
Northeast	73	32.4	81	33.5	110	34.7	113	29.3	121	29.4	118	29.9	93	23.5
Midwest	17	7.6	4	1.7	8	2.5	18	4.7	9	2.2	14	3.5	19	4.8
South	91	40.4	122	50.4	177	55.8	198	51.3	190	46.1	188	47.6	175	44.3
West	30	13.3	28	11.6	22	6.9	46	11.9	54	13.1	43	10.9	64	16.2
Puerto Rico/Virgin Islands	14	6.2	7	2.9	0	0.0	11	2.8	38	9.2	32	8.1	44	11.1

IDU, injection drug user.

The number of newly identified HIV+ tests among MSM decreased in every region except the West, where it rose 421% (see Table 7). Increased numbers of newly identified HIV+ tests were seen among white MSM and men over 30 years old. Newly identified HIV+ tests decreased among blacks and Hispanics and younger men.

The number of IDUs with newly identified HIV+ tests among men and women increased differentially in the South and West, but decreased in the Northeast and Midwest (see Tables 8 and 9). Among IDU men, newly identified HIV+ tests increased only among those over 40 years old. Younger men and all racial/ethnic groups had decreased numbers of newly identified HIV+ tests. Among IDU women, newly identified HIV+ tests increased among persons over 40 years and blacks, but decreased in all other categories.

TABLE 5. Newly identified HIV infections among males with heterosexual risk behaviors

	1992 (n = 234)		1993 (n = 269)		1994 (n = 364)		1995 (n = 391)		1996 (n = 429)		1997 (n = 443)		1998 (n = 420)		Percentage change
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Age group, years															
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
13–19	4	1.7	4	1.5	9	2.5	15	3.8	15	3.5	10	2.3	22	5.2	450
20–29	109	46.8	120	44.6	121	33.2	155	39.6	137	31.9	140	31.6	109	26.0	0
30–39	89	38.2	102	37.9	179	49.2	163	41.7	194	45.2	197	44.5	193	46.0	117
40–49	26	11.2	33	12.3	49	13.5	46	11.8	65	15.2	72	16.3	73	17.4	181
≥50	3	1.3	10	3.7	5	1.4	12	3.1	15	3.5	22	5.0	19	4.5	133
Race/ethnicity															
White	18	7.7	21	7.8	34	9.3	34	8.7	37	8.6	31	7.0	39	9.3	117
Black	146	62.4	180	67.2	253	69.5	292	74.7	321	74.8	349	79.0	285	67.9	95
Hispanic	67	28.6	63	23.5	70	19.2	58	14.8	64	14.9	56	12.7	86	20.5	28
Asian/Pacific															
Islander	0	0.0	1	0.4	0	0.0	0	0.0	0	0.0	1	0.2	3	0.7	Undefined
American Indian/ Native Alaskan	3	1.3	0	0.0	3	0.8	0	0.0	3	0.7	0	0.0	3	0.7	0
Region															
Northeast	98	41.9	88	32.7	126	34.6	129	33.0	121	28.2	118	26.6	98	23.3	0
Midwest	44	18.8	38	14.1	24	6.6	31	7.9	32	7.5	44	9.9	41	9.8	–7
South	63	26.9	106	39.4	195	53.6	211	54.0	252	58.7	252	56.9	227	54.0	260
West	7	3.0	15	5.6	18	4.9	16	4.1	14	3.3	14	3.2	31	7.4	343
Puerto Rico/ Virgin Islands	22	9.4	22	8.2	1	0.3	4	1.0	10	2.3	15	3.4	23	5.5	5

DISCUSSION

Large numbers of HIV+ tests were identified in correctional facilities through VCTR. The proportion that were HIV+ among all tests in the CDC Counseling and Testing System was 2.0% in 1992 and 1.5% in 1996, compared to a range of 5.0% in 1992 to 2.8% in 1998 in this testing population.²³ VCTR in correctional facilities differs from its use in the general population in follow-up possibilities and style. More tests in prisons are followed by posttest counseling (86% for prisons vs. 67% for the general population; 90% vs. 74%, respectively, of positive tests), and fewer tests are anonymous (12% vs. 29%, respectively). State and local HIV testing policies for correctional facilities may limit access to anonymous services.⁵ High posttest counseling rates suggest that incarcerated testers are more likely to receive their results than testers at most other sites.²³

Unlike other testing sites in the HIV Counseling and Testing services in correctional facilities exhibit an upward trend of overall tests offered, the number of positive HIV tests returned, and the number of newly identified HIV+ tests returned (CDC, unpublished data; 1992–1996). In particular, the number of newly identified HIV+ tests with reports of heterosexual risk behaviors increased substantially. This appears to be driven, in part, by the rapid increase in tests for persons with heterosexual risk behaviors. The steady increase in numbers of tests could be attributed to a number of possible factors:

TABLE 6. Newly identified HIV infections among females with high heterosexual risk behaviors

	1992 (n = 77)		1993 (n = 98)		1994 (n = 187)		1995 (n = 222)		1996 (n = 244)		1997 (n = 243)		1998 (n = 234)		Percentage change
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Age group, years															
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0	0
13–19	3	3.9	7	7.1	6	3.2	9	4.1	7	2.9	3	1.2	8	3.4	167
20–29	37	48.7	48	49.0	79	42.2	82	36.9	95	38.9	83	34.2	77	32.9	108
30–39	29	38.2	40	40.8	80	42.8	97	43.7	120	49.2	121	49.8	109	46.6	276
40–49	7	9.2	3	3.1	20	10.7	26	11.7	18	7.4	32	13.2	28	12.0	300
≥50	0	0.0	0	0.0	2	1.1	4	1.8	4	1.6	3	1.2	8	3.4	Undefined
Race/ethnicity															
White	9	11.7	17	17.3	29	15.5	44	19.8	53	21.9	53	21.8	41	17.5	356
Black	57	74.0	74	75.5	135	72.2	153	68.9	139	57.4	152	62.6	145	62.0	154
Hispanic	11	14.3	5	5.1	21	11.2	22	9.9	45	18.6	32	13.2	45	19.2	309
Asian/Pacific															
Islander	0	0.0	2	2.0	1	0.5	0	0.0	1	0.4	2	0.8	1	0.4	Undefined
American Indian/ Native Alaskan	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0	0	0.7	0
Region															
Northeast	13	16.9	18	18.4	53	28.3	50	22.5	62	25.4	61	25.1	54	23.3	315
Midwest	6	7.8	0	0.0	3	1.6	9	4.1	4	1.6	9	3.7	15	9.8	150
South	45	58.4	69	70.4	120	64.2	135	60.8	126	51.6	127	52.3	98	54.0	118
West	10	13.0	9	9.2	11	5.9	23	10.4	27	11.1	25	10.3	36	7.4	260
Puerto Rico/ Virgin Islands	3	3.9	2	2.0	0	0.0	5	2.3	25	10.2	21	8.6	31	5.5	933

1. The number of incarcerated persons has increased.
2. HIV community prevention planning groups may be targeting incarcerated populations for VCTR.
3. Availability of antiretroviral therapy increases attractiveness of knowing one's status.
4. There are an increased number of incarcerated IDUs or others who are aware of their risk status and desirous of knowing their HIV status.¹¹
5. There is a desire to prove seronegativity to fellow inmates.²⁵

VCTR acceptance rates vary widely.²⁵ A study reviewing the effectiveness of VCTR to identify HIV infections among prison inmates suggested that acceptance of services may differ from high-prevalence settings to low-prevalence settings.¹¹ In a Maryland prison, only 34% of seropositive inmates who did not know their HIV serostatus sought VCTR. This is lower than other observed rates in Oregon (50%) and Wisconsin (72%), suggesting that seropositivity rates observed in VCTR in correctional facilities may be underestimates by 25%–65%, depending on seroprevalence in the facility.

This analysis noted repeat testing when there was self-report of HIV+ serostatus. An earlier study found that persons who know that they are HIV+ are less likely to seek VCTR.¹¹ However, it is unknown what proportion of incarcerated HIV+ persons the repeat tests represent. Generally, repeat testing for those with confirmed positive tests is inappropriate. If a client reports a prior positive test and the counselor can document the test, repeat testing should not be performed as it

TABLE 7. Newly identified HIV infections among males who have sex with men

	1992 (n = 197)		1993 (n = 202)		1994 (n = 166)		1995 (n = 191)		1996 (n = 150)		1997 (n = 150)		1998 (n = 215)		Percentage change
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Age group, years															
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
13–19	9	4.6	4	2.0	2	1.2	4	2.1	6	4.0	3	2.0	6	2.8	–39
20–29	109	55.3	103	51.0	75	45.5	80	41.9	49	32.7	65	43.3	80	37.2	–33
30–39	66	33.5	81	40.1	72	43.6	90	47.1	79	52.7	66	44.0	102	47.4	42
40–49	12	6.1	14	6.9	13	7.9	15	7.9	15	10.0	13	8.7	25	11.6	91
≥50	1	0.5	0	0.0	2	1.2	0	0.0	1	0.7	2	1.3	2	0.9	83
Risk behavior															
MSM/IDU	87	44.2	85	42.1	45	27.1	57	29.8	48	32.0	39	26.0	47	21.9	–50
MSM	110	55.8	117	57.9	121	72.9	134	70.2	102	68.0	111	74.0	168	78.1	40
Race/ethnicity															
White	35	17.8	48	23.8	30	18.2	45	23.6	26	17.4	31	20.7	56	26.0	47
Black	112	56.9	116	57.4	116	70.3	108	56.5	93	62.4	81	54.0	102	47.4	–17
Hispanic	50	25.4	36	17.8	19	11.5	33	17.3	26	17.4	36	24.0	53	24.7	–3
Asian/Pacific Islander	0	0.0	2	1.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.5	Undefined
American Indian/ Native Alaskan	0	0.0	0	0.0	0	0.0	3	1.6	1	0.7	0	0.0	2	0.9	Undefined
Region															
Northeast	46	23.4	41	20.3	33	19.9	32	16.8	23	15.3	17	11.3	22	10.2	–56
Midwest	33	16.8	24	11.9	32	19.3	27	14.1	13	8.7	17	11.3	17	7.9	–53
South	75	38.1	93	46.0	85	51.2	94	49.2	70	46.7	55	36.7	48	22.3	–41
West	22	11.2	32	15.8	14	8.4	38	19.9	42	28.0	59	39.3	125	58.1	421
Puerto Rico/ Virgin Islands	21	10.7	12	5.9	2	1.2	0	0.0	2	1.3	2	1.3	3	1.4	–87

IDU, injection drug user; MSM, men who have sex with men.

may encourage a lack of faith in the quality of tests.²⁰ In the present study, 44% of seropositive tests were for people who already knew their status. This could be attributed to people who test positive anonymously or in other facilities who need to repeat the test confidentially to access services for HIV+ persons.

We found the proportion of tests performed within the major risk groups to be similar to published reports from the 1980s of 27%–41% for IDUs and 0%–7% for MSM, indicating that the proportion of tests within these risk groups remained steady in the incarcerated population.^{26–29}

Unlike other studies, we found women's HIV+ test rates to be only slightly higher than those of men.^{5,30} Only Hispanic women had a rate appreciably higher than their male counterparts. This could be the result of the large number of tests performed among women in this study. Other studies enrolled far fewer women, and they were consecutively inducted women, as opposed to women seeking VCTR.^{12,30}

The HIV+ test rate among women in this analysis is similar to the prevalence rate found in a national survey of women prison inmates.⁵ In that national survey, less than 10% of women reported ever being tested for HIV. Women account for about 6% of prison populations and 11% of jail populations. Yet, one quarter of CDC-funded HIV tests between 1992 and 1996 were for women.

Women who have the opportunity to seek HIV testing may be more likely to

TABLE 8. Newly identified HIV infections among males who reported injection drug use

	1992 (n = 562)		1993 (n = 509)		1994 (n = 315)		1995 (n = 351)		1996 (n = 355)		1997 (n = 314)		1998 (n = 304)		Percentage change
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Age group, years															
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
13–19	6	1.1	5	1.0	2	0.6	3	0.9	2	0.6	6	1.9	5	1.6	–17
20–29	157	28.0	142	28.1	58	18.4	60	17.1	43	12.1	64	20.4	57	18.8	–64
30–39	295	52.7	258	51.1	170	54.0	184	52.4	195	54.9	144	45.9	120	39.5	–59
40–49	93	16.6	93	18.4	71	22.5	99	28.2	108	30.4	86	27.4	113	37.2	22
≥50	7	1.3	6	1.2	10	3.2	5	1.4	6	1.7	13	4.1	8	2.6	14
Risk behavior															
MSM/IDU	87	15.5	85	16.7	45	14.3	57	16.2	48	13.5	39	12.4	47	15.5	–46
Heterosexual IDU	475	84.5	424	83.3	270	85.7	294	83.8	307	86.5	275	87.6	257	84.5	–46
Race/ethnicity															
White	108	19.3	106	20.8	57	18.1	63	17.9	65	18.3	71	22.6	79	26.0	–27
Black	226	40.4	202	39.7	163	51.7	195	55.6	197	55.5	158	50.3	156	51.3	–31
Hispanic	224	40.0	196	38.5	92	29.2	88	25.1	87	24.5	80	25.5	67	22.0	–70
Asian/Pacific															
Islander	0	0.0	2	0.4	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	0
American Indian/ Native Alaskan	0	0.0	1	0.2	1	0.3	2	0.6	1	0.3	0	0.0	2	0.7	Undefined
Region															
Northeast	276	49.1	182	35.8	165	52.4	149	42.5	134	37.7	82	26.1	82	27.0	–70
Midwest	59	10.5	36	7.1	22	7.0	19	5.4	14	3.9	18	5.7	19	6.3	–68
South	105	18.7	160	31.4	103	32.7	141	40.2	151	42.5	133	42.4	114	37.5	9
West	30	5.3	34	6.7	19	6.0	31	8.8	36	10.1	41	13.1	64	21.1	113
Puerto Rico/ Virgin Islands	92	16.4	97	19.1	6	1.9	11	3.1	20	5.6	40	12.7	25	8.2	–73

IDU, injection drug users; MSM, men who have sex with men.

do so than men. They may also seek multiple tests, which could drive the overall percent seropositive rate down. Women may be more likely to seek medical care in correctional facilities because of either sexually transmitted diseases or for routine gynecological/obstetrical examinations, giving them an additional opportunity to be offered VCTR. Or, women's facilities with publicly funded testing may be more likely to emphasize the importance of knowing one's HIV serostatus, especially with the availability of AZT (azidothymidine) to prevent maternal-fetal transmission.

This analysis is subject to several limitations. The Counseling and Testing System reports on each encounter, not on individual clients. Therefore, because multiple tests by an individual may occur, the numbers of positive or negative tests are not equal to the numbers of persons who tested positive or negative. Also, it is not generalizable beyond the testing population. The population accessing CDC-funded sites for HIV counseling, testing, and referral services is self-selected and not representative of the general or the incarcerated population of all persons at risk of contracting HIV.

Consideration of VCTR acceptance rates bears this out. Four studies⁶ of VCTR acceptance rates in prisons found a range between 47% and 89%. Correctional systems have a wide variety of HIV testing policies that can have an impact on acceptance. For example, 41% of states and 15% of local jurisdictions notify cor-

TABLE 9. Newly identified HIV infections among females who reported injection drug use

	1992		1993		1994		1995		1996		1997		1998		Percentage change
	(n = 147)		(n = 136)		(n = 116)		(n = 143)		(n = 142)		(n = 136)		(n = 149)		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Age group, years															
5–12	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
13–19	1	0.7	1	0.7	0	0.0	1	0.7	2	1.4	0	0.0	0	0.0	–100
20–29	54	36.7	53	39.0	37	31.9	43	30.1	28	19.7	36	26.5	37	24.8	–31
30–39	75	51.0	64	47.1	60	51.7	69	48.3	81	57.0	72	52.9	73	49.0	–3
40–49	14	9.5	18	13.2	18	15.5	26	18.2	27	19.0	26	19.1	35	23.5	150
≥50	2	1.4	0	0.0	1	0.9	3	2.1	3	2.1	2	1.5	4	2.7	100
Race/ethnicity															
White	47	32.2	47	34.8	33	28.4	53	37.1	50	35.2	39	28.7	44	29.5	–6
Black	60	41.1	55	40.7	60	51.7	54	37.8	58	40.8	66	48.5	75	50.3	25
Hispanic	38	26.0	29	21.5	21	18.1	34	23.8	33	23.2	29	21.3	28	18.8	–26
Asian/Pacific															
Islander	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
American Indian/ Native Alaskan	1	0.7	1	0.7	2	1.7	1	0.7	0	0.0	1	0.7	2	1.3	100
Region															
Northeast	60	40.8	63	46.3	49	42.2	59	41.3	54	38.0	54	39.7	37	24.8	–38
Midwest	11	7.5	4	2.9	5	4.3	9	6.3	4	2.8	5	3.7	4	2.7	–64
South	46	31.3	48	35.3	53	45.7	51	35.7	50	35.2	54	39.7	70	47.0	52
West	20	13.6	18	13.2	9	7.8	19	13.3	24	16.9	14	10.3	26	17.4	30
Puerto Rico/ Virgin Islands	10	6.8	3	2.2	0	0.0	5	3.5	10	7.0	9	6.6	12	8.1	20

rectional management, and 12% and 7%, respectively, notify correctional officers. This may dampen response to VCTR. Twelve state prison systems of 48 reporting states have mandatory HIV testing for inmates,⁵ although none of these should be reported to the CDC Counseling and Testing System.

Previous test history and risk behaviors are self-reported and may be misreported. All state prison systems and 88% of local jails have policies to notify inmates of a positive test.⁵ Therefore, recidivists tested in correctional facilities may be more likely to know the results of their previous tests.

The mutually exclusive hierarchy used to assign risks limits some of the breadth of risk behavior analysis. For example, a person who traded sex for drugs or money will be listed as an IDU if the person reported both behaviors, so behaviors perceived as being less risky are underreported in this analysis.

VCTR in prisons successfully reaches an at-risk population, especially one that may be underserved or have limited access to health care. In particular, newly infected, high-risk heterosexuals and IDUs were identified in large numbers in correctional facilities. VCTR sites are performing more tests and may be finding more infections, thus informing people of their HIV status and giving more people the opportunity to seek treatment and initiate prevention behaviors. This analysis also suggests that incarcerated populations might benefit from targeted HIV prevention measures. The National Commission on Correctional Health Care recommends HIV/AIDS (acquired immunodeficiency syndrome) education for all staff and inmates, VCTR for inmates, and adherence to the Public Health Service guidelines for medical management of HIV-infected persons. The commission opposes segre-

gation of HIV+ inmates.³¹ However, each jurisdiction creates its own HIV/AIDS policy, leading to great disparities across the United States.

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