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Survey of Childbearing Women for HIV Infection, Virginia*

In 1988 the Centers for Disease Control (CDC) initiated a national population-based survey in cooperation with state and local health departments to determine the prevalence of human immunodeficiency virus (HIV) infection in childbearing women in the United States. What follows is a summary of the survey findings in Virginia, to date.

Since maternal HIV antibodies cross the placenta, the presence of HIV antibodies in newborn sera indicates either that the woman alone is infected or that both the woman and her infant are infected.[1] It is estimated that 30% of children born to HIV infected mothers will have perinatally acquired HIV infection.[2]

Anonymous screening of newborns for surveillance purposes provides for monitoring of trends in the distribution of HIV infection among the population of childbearing women. The Institute of Medicine's Committee on Prenatal and Newborn Screening for HIV Infection endorsed anonymous screening as an efficient method for collecting unbiased epidemiological data that allows effective evaluation of anticipated health care needs within a geographic area.[3] This information can be used to target high risk localities in order to encourage voluntary counseling and testing, thus allowing women to make informed reproductive decisions.

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Methods

Dried blood specimens submitted to the state lab (Division of Consolidated Laboratory Services [DCLS]) for legally required tests of inborn errors of metabolism were used for HIV antibody testing. After mandated tests had been completed, personal identifiers were removed from blood specimens. Demographic information (mother's age, zipcode, race/ethnicity, and month and year of birth of the infant) was recorded and specimens were tested for presence of HIV antibodies by the Virology Section, DCLS. Each specimen was tested for presence of HIV antibody using the enzyme-linked immunosorbent assay (EIA). Repeatedly reactive specimens were tested further by Western blot. Positive HIV status was assigned to specimens which repeatedly tested positive on EIA and which displayed at least two of three key bands (p24, gp41, gp120/gp160) on Western blot.[4]

The first phase was conducted from August 1989 to February 1990. Only specimens from full term births that were not reactive on newborn screening were tested during this survey. Approximately 77% of the total number of samples submitted for newborn screening were submitted for HIV testing during this time period. Approximately 9% of the samples submitted for HIV screening were not tested due to ineligibility (not full term, multiple birth, specimen too old, repeat specimen) or due to an insufficient amount of blood remaining in the sample after completion of mandated tests.

The second phase was conducted from July 1990 to June 1991. During this phase, specimens from both full term and premature births that were not reactive on newborn screening were tested. Eighty-five percent of specimens collected for newborn screening (87,941) were earmarked for HIV testing and of these, 2.1% were not tested due to ineligibility or

Table 1. Seroprevalence of antibody to HIV in Virginia, by race and study phase

	Phase I			Phase II		
Race	# Tested	# Pos.	% Pos.	# Tested	# Pos.	% Pos.
White	26638	15	0.06	55542	20	0.04
Black	9441	23	0.24	17322	60	0.35
Hispanic	906	1	0.11	1557	2	0.13
Asian	640	1	0.16	1118	0	0.00
Am.Indian	34	0	0.00	72	0	0.00
Other	432	0	0.00	695	0	0.00
Unknown	4141	8	0.19	9792	11	0.11
Total	42232	48	0.11	86098	93	0.11

due to insufficient blood in the sample.

Missing age and race information was a persistent problem, with 11% of samples missing race information and 19% missing age information. Among positive specimens, 13.5% lacked race information and 19.2% lacked age information.

Statistical comparisons of data were conducted using a chi-square comparison of proportions.[5] Due to the small number of specimens classified as race other than white or black, comparisons of race included only white, black and other (including Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native and mixed race). Also, due to the small number of specimens from women younger than 15 or older than 44, comparisons of age groups were analyzed only for specimens identifying the mother's age from 15 through 44. Statistical comparisons included only records for which demographic information was available.

Results

There was no significant difference in the seroprevalence rate among childbearing women during the two phases of the survey. The overall rate during both phases was 0.11% (1.1 per thousand).

The overall (both phases combined) seroprevalence rate for black females was significantly higher than the rate for other racial groups. The seroprevalence among blacks was 0.31%, or nearly 3 per 1000 ($p<0.001$). This rate showed a nonsignificant increase from the first to the second phase (Table 1).

Among 113,270 survey participants whose race was known, black women accounted for 23.6%. However, they accounted for 68.9% of the samples testing positive, increasing from 57.5% during the first phase to 71.2% in the second phase. This distribution of race among HIV seropositive childbearing women is similar to the distribution of race for HIV seropositivity among all adult females reported to the Virginia Department of Health between July 1989 and December 1991 (of 602 women reported with HIV infection, 74% were black).

There was no significant difference in seropositivity across age groups within the range studied (ages 15 to 44). Thirteen women testing positive were between the ages of 15 and 19 (Table 2).

Although the seroprevalence rate among women living in the eastern health planning region was significantly higher than the rates in other regions ($p<0.03$), this did not hold true after controlling for race in a stratified analysis.

The rate of HIV seropositivity in urban areas (all eight Metropolitan Statistical Areas combined**) was significantly higher (75/63,045 or 0.12%) than in rural areas (13/19,617 or 0.07%, $p<0.05$). Again, this did not hold true after controlling for race in a stratified analysis.

A unique factor present in the second phase was the opportunity to compare women bearing full term vs. premature infants. A significant difference in the seroprevalence rates of these groups was found. The rate of HIV infection in women bearing premature infants was 0.21%, compared to 0.10% in women bearing full term infants ($p<0.05$). Once again, this difference did not hold true after controlling for race. The seroprevalence rate among non-white females bearing premature infants (black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native and mixed race) was 0.72% (Table 3).

Discussion

The seroprevalence rate among childbearing women in Virginia was 0.11% during the first and second phases. The reason for the higher rate among blacks could not be examined from the standpoint of risk factors because information on risk factors was not available. The comparable national rate for all races is approximately 0.15%, based on surveys conducted in 38 states and the District of Columbia between January 1988 and September 1990.

While it is reassuring that the overall rate in Virginia did not increase over the study period, two disturbing results were seen. First, the rate among black women in the initial phase was 0.24%, compared to 0.35% in the second. Although not a statistically significant increase, this

Table 2. Seroprevalence of antibody to HIV in Virginia, by age group and study phase

	Phase I			Phase II		
Age	#Tested	#Pos	%Pos	#Tested	#Pos	%Pos
<15	112	0	0.00	211	0	0.00
15-19	4072	6	0.15	8123	7	0.09
20-24	9099	17	0.19	18343	21	0.11
25-29	10562	7	0.07	21567	30	0.14
30-34	7036	7	0.10	15402	10	0.06
35-39	2388	2	0.08	5550	2	0.04
40-44	391	0	0.00	845	2	0.24
45+	18	0	0.00	25	0	0.00
Unknown	8554	9	0.11	16032	21	0.13
Total	42232	48	0.11	86098	93	0.11

finding bears watching to determine if a worsening trend is present. Second, although no one age group was found to be at significantly greater risk, most of the HIV infected women giving birth in this survey were between the ages of 20 and 29, and 13 women 15 to 19 years of age were also positive. The prevalence of HIV infection in these young women underscores the need for HIV/AIDS education at an early age.

Analysis of rates by region and urbanism failed to identify clear-cut geographic areas that should be targeted for prevention activities. These data suggest that such efforts should be applied evenly on a statewide basis.

Additional studies are needed to determine the reason for the higher rate among black childbearing women.

Counseling and testing services should not be limited to a particular race or age group. It is recommended that voluntary HIV counseling and testing be offered to all women seeking health care. A cursory evaluation of patients may not necessarily suggest risks for HIV infection, and due to the sensitive nature of HIV infection, information volunteered during history-taking may not reveal risk factors. Therefore, it is imperative that physicians conduct an in-depth and critical evaluation for risk factors.

HIV counseling and testing have been provided in Virginia public health clinics since 1986. Both confidential and anonymous testing sites are available. Information on testing sites can be obtained by calling the AIDS Hotline at 1-800-533-4148.

The third phase of the survey, (Oct 1991-Sept 1992), will continue to compare data on full-term vs. premature births. In addition, those specimens found abnormal by newborn screening will also be tested for HIV infection during the third phase.

Reports of influenza-like illness from sentinel physicians in Virginia through January 15. Activity in mid-January remained characterized as widespread. There have been 51 influenza A isolates reported in Virginia, 9 from the southwest region, and 42 from the northern region. Twenty-one of the isolates have been subtyped as A Beijing and two as A Taiwan. One seroconversion to Influenza B was reported in the central region.

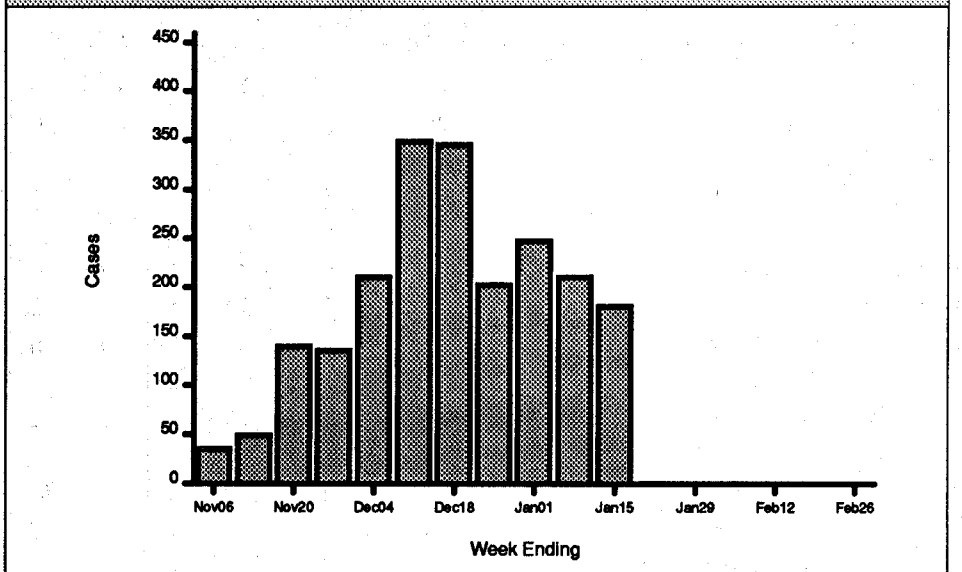

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Table 3. Seroprevalence of antibody to HIV in Virginia, by race and birth status, July, 1990-June, 1991.

	Full Term			Premature		
Race	#Tested	#Pos	%Pos	#Tested	#Pos	%Pos
White	52932	20	0.04	2610	0	0.00
Black	16221	52	0.32	1101	8	0.73
Hispanic	1497	1	0.07	60	1	1.67
Asian	1083	0	0.00	35	0	0.00
Am.Indian	70	0	0.00	2	0	0.00
Other	649	0	0.00	46	0	0.00
Unknown	9383	11	0.12	409	0	0.00
Total	81835	84	0.10	4263	9	0.21

Cases of Selected Notifiable Diseases, Virginia, December 1 through December 31, 1991.

Disease	Total Cases Reported This Month						Total Cases Reported to Date in Virginia		
		Regions							
	State	NW	N	SW	C	E	This Yr	Last Yr	5 Yr Avg
AIDS	49	3	23	4	16	3	674	649	381
Campylobacter	38	5	7	5	11	10	640	598	650
Gonorrhea*	1234	-	-	-	-	-	18172	18426	16961
Hepatitis A	12	1	4	1	1	5	191	302	279
Hepatitis B	17	1	2	2	2	10	220	279	386
Hepatitis NANB	7	2	2	1	2	0	37	46	64
Influenza	209	30	1	34	2	142	986	937	2359
Kawasaki Syndrome	0	0	0	0	0	0	24	24	23
Legionellosis	1	1	0	0	0	0	17	13	16
Lyme Disease	8	2	1	4	0	1	151	129	49
Measles	0	0	0	0	0	0	30	86	82
Meningitis, Aseptic	56	1	10	3	6	36	463	386	321
Meningitis, Bacterial~	13	2	1	1	3	6	134	144	189
Meningococcal Infections	6	1	1	2	1	1	38	58	68
Mumps	9	0	3	2	0	4	70	108	101
Pertussis	0	0	0	0	0	0	24	25	41
Rabies in Animals	13	4	4	1	1	3	253	202	279
Reye Syndrome	0	0	0	0	0	0	2	1	1
Rocky Mountain Spotted Fever	0	0	0	0	0	0	19	25	26
Rubella	0	0	0	0	0	0	0	1	3
Salmonellosis	71	5	20	9	18	19	1312	1491	1592
Shigellosis	16	1	6	8	1	0	384	158	283
Syphilis (1° & 2°)*	28	1	6	2	10	9	871	919	543
Tuberculosis	61	0	31	2	4	24	352	410	417

Localities Reporting Animal Rabies: Albemarle 1 skunk; Caroline 1 skunk; Fairfax 1 raccoon; Isle of Wight 1 raccoon; Loudoun 1 fox, 1 raccoon; Lunenburg 1 raccoon; Newport News 2 raccoons; Prince William 1 skunk; Pulaski 1 skunk; Spotsylvania 1 skunk; Stafford 1 skunk.

Occupational Illnesses: Asbestosis 13; Carpal Tunnel Syndrome 60; Coal Workers' Pneumoconiosis 24; Dermatitis 2; Loss of Hearing 11; Repetitive Motion Disorder 6; Silicosis 1.

*Total now includes military cases to make the data consistent with reports of the other diseases.
~Other than meningococcal

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