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Characteristics associated with lack of HIV testing during pregnancy and delivery in 36 U.S. states, 2004-2013

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Abstract

The Centers for Disease Control and Prevention and the American Congress of Obstetricians and Gynecologists recommend universal prenatal HIV testing to prevent perinatal HIV transmission in the U.S.; since the 1990s perinatal HIV transmission has declined. In 2006, 74% of women with a recent live birth reported testing for HIV prenatally or at delivery. We used Pregnancy Risk Assessment Monitoring System data from 36 states and New York City from 2004 to 2013 (N = 387,424) to assess characteristics associated with lack of self-reported testing and state-to-state variability in these associations. Overall, 75.2% (95% confidence interval [CI] 75.0–75.5) of women with a recent live birth reported an HIV test. There were significant differences in testing prevalence by state, ranging from 91.8% (95% CI 91.0–92.6) in New York to 42.3% (95% CI 41.7–43.5) in Utah. In adjusted analysis, characteristics associated with no reported testing included being married, white, non-Hispanic, multiparous, not smoking during pregnancy, and having neither Medicaid nor Special Supplemental Nutritional Program for Women, Infants, and Children. White married women were 57% (adjusted prevalence ratio [aPR] 1.57, 95% CI 1.52–1.63) more likely to report no test compared to white unmarried women. Multiparous married women were 57% (aPR 1.57, 95% CI 1.51–1.64) more likely to report no test compared to multiparous unmarried women. Women who were married, white, non-Hispanic, and multiparous women were 23% less likely to be tested than other women combined. Marital status was significantly associated with lower prevalence of testing in 35 of the 37 reporting areas, and race was significant in 30 of 35 states with race information. The prevalence of reported HIV testing during pregnancy or at delivery remains below 80%. Opportunities exist to increase HIV testing among pregnant women, particularly among certain subpopulations.

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Disclaimer

The findings and conclusions in this manuscript are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Declaration of conflicting interests

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Keywords

HIV; pregnancy; prenatal; testing; screening; prevention; mother-to-child transmission; Pregnancy Risk Assessment Monitoring System; disparities

Introduction

Although HIV transmission in the U.S. remains a public health concern, HIV transmission from mothers to infants during pregnancy, delivery, or postpartum is now rare.[1,2] Since the late 1990s, perinatal HIV acquisition has been reduced 96%, to 1.75/100,000 in 2013.[2] Through advances in pharmaceutical and clinical research, guidelines development, and changes to clinical practice, the number of HIV-infected children born in the U.S. decreased from an estimate of 1650 in 1991 to 69 in 2013, and perinatal transmission rates decreased from 35% to less than 3%.[1,2]

Five steps in clinical care contribute to reduce perinatal transmission; the first is the diagnosis of maternal HIV infection, which evolved from a counseling and testing approach to an 'opt-out' approach at prenatal care intake, or at delivery for those with undocumented HIV testing during pregnancy.[3,4] The second involves provision of antiretroviral therapy for all HIV-infected pregnant women through pregnancy, delivery, and postpartum; third is consideration of cesarean delivery; fourth is alternatives to maternal breastfeeding;[5] fifth is infant antiretroviral prophylaxis.[6]

The Centers for Disease Control and Prevention (CDC) and the American Congress of Obstetricians and Gynecologists (ACOG) now recommend universal HIV testing early during pregnancy, a second test in the third trimester for women at high risk, and testing at labor and delivery for those with undocumented HIV status.[3–5] Testing is critical to prevention since it allows for consideration and implementation of the five steps above;[6] these five can reduce the risk of mother-to-child transmission to less than 1%.[7] However, although state laws and national guidelines and recommendations support universal HIV testing during each pregnancy,[3–5] and testing is cost effective even at very low prevalence,[8] not all women receive a test.[9,10]

A companion paper[11] using the Pregnancy Risk Assessment Monitoring System (PRAMS) examined trends in self-reported HIV testing rates from 2004 to 2011 (the most current available) in relation to state policies and found little to no change in the testing rate over time. We used PRAMS data from 2004 to 2013 to assess whether characteristics differed between tested women and not tested women, nationally and by state, in order to inform policy-makers and clinicians about opportunities to increase communication and testing.

Methods

PRAMS is an ongoing population-based surveillance collaboration between CDC and state health departments that identifies and monitors selected maternal experiences, behaviors, and conditions before, during, and after pregnancy.[12] During each annual surveillance period during 2004–2013, PRAMS surveyed a sample of postpartum women who delivered a live-

born infant; in 2013, the survey was being administered in 36 participating states and New York City. Our sample represents approximately 70% of all live births in the United States during this period[13,14] (Appendix A in online supplemental files).

A state's birth certificate file serves as the sampling frame; each state uses the same standardized mailtelephone methodology. Between two and four months following delivery, surveys are sent by mail to the birth mother; mail nonrespondents are contacted via telephone. PRAMS-participating state health departments select and employ state-specific stratification schemes, oversampling subpopulations of particular public health interest, such as mothers of low birthweight infants and racial/ethnic minority groups. Annual sample sizes vary by state (see Appendix A in online supplemental files), with larger sample sizes for larger states or those with more complex stratification schemes.[14,15] In each state, self-reported survey data are linked to birth certificate data for each year and weighted for sample design, nonresponse, and nonco-verage to be representative of all women who gave birth to a live-born infant. Detailed information about the PRAMS methodology is available (http://www.cdc.gov/prams/methodology.htm). The CDC and local Institutional Review Boards approved the PRAMS protocol and use of deidentified data by investigators for secondary analyses.

PRAMS requires that published data meet or exceed minimum weighted response rates of 70% for years 2004–2006, 65% for years 2007–2011, and 60% for 2012 and 2013. We used PRAMS data from 36 states and New York City (hereafter referred to as 'states') meeting these criteria, combining the years 2004–2013, representing 70% of live births (see Appendix A and Appendix B in online supplemental files). All participating PRAMS sites approved this analysis.

Variables

Pregnancy-related characteristics explored were based on previous literature.[9,10] Data on maternal demographic characteristics (maternal age, education, race, ethnicity, and marital status) were derived from the birth certificate, while pregnancy intention; parity; income; enrollment in the Special Supplemental Nutritional Program for Women, Infants, and Children (WIC) and Medicaid; smoking status during last trimester; alcohol use (before and during pregnancy); length of delivery hospital stay; physical abuse; hospitalization during pregnancy; and prenatal care visits (onset, number) were based on self-report from the PRAMS questionnaire. Since income data are collected by states for local purposes, the income categories used by states do not always match; we used the following categories and fit states' data as appropriate into the closest fitting category: $0-$15,000, $15,000-$50,000, or greater than $50,000.

Since questions assessing insurance coverage during pregnancy and delivery changed during 2004–2013, women who answered 'yes' to the question about whether they had Medicaid (2004–2008), answered 'Medicaid' to the question about the type of insurance for prenatal care and delivery (2009–2011), or answered 'Medicaid' to the question about the type of insurance during prenatal care (2012–2013) were classified as having Medicaid. Because WIC and Medicaid status were collinear, we combined responses for insurance and WIC into the following categories: neither Medicaid nor WIC, WIC only, Medicaid only, or both.

We used the Kessner index (measure of timing and number of visits) as an indicator of prenatal care quality,[16] classified maternal education based on years of school completed, and pregnancy intention using the following question, 'Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant?' Women who answered that they wanted their pregnancy 'sooner' or 'then' were classified as having an intended pregnancy, and those who answered 'later,' 'did not want,' or 'did not want at any time' were classified as having an unintended pregnancy.

Outcome

Women were asked if they had received a test for HIV during prenatal care visits or at delivery. For this analysis, we used this question 'At any time during your most recent pregnancy or delivery, did you have a test for HIV (the virus that causes AIDS)?' Respondents who answered 'yes' or 'no' were included in the analysis.

Analysis

Sample weights were used in all analyses to account for unequal probability of selection. SAS-callable SUDAAN (RTI International, Research Triangle Park, NC) was used to account for the stratified complex survey design; we present weighted estimates. We used Chi square tests to examine differences in distribution of characteristics between women tested and not tested for HIV. We performed multivariable analyses with main effects in bivariate analyses with $P < 0.15$. Nonsignificant effects were removed stepwise from the model; this was repeated until a parsimonious model with all significant effects at $P < 0.001$ was observed. Because the national sample was very large, the overall final multivariable logistic regression model included main effects, then main effects variables were examined for two-way interactions; terms of $p < 0.001$ were retained. Because more than 10% of women reported no HIV test during pregnancy or at delivery, for the national analysis we calculated adjusted prevalence ratios (aPRs) by using predicted marginals from logistic regression models and then converting these estimates to prevalence ratios.[17]

Results

A total of 37 PRAMS states reported one or more years of data during 2004–2013, for a total unweighted sample size of 387,424. Appendix A and Appendix B in the online supplemental files include yearly state-specific sample sizes and response rates.

On reporting of an HIV test, 334,166 (86%) responded 'yes' or 'no' and were included. Among included women, 53.4% (for 95% confidence interval [CI] see Table 1) were aged 25–34 years, 70.9% were white, 16.9% were Hispanic, 60.9% were married, 29.2% made less than $15,000 per year, 42.0% had delivered their first child, 58.8% had intended pregnancies, 11.5% smoked in their last trimester, 36.8% received both Medicaid and WIC, 66.8% reported adequate prenatal care (Table 1). In addition, 89.2% (95% CI 89.1–89.4) were hospitalized for four days or less for delivery, 55.6% (95% CI 55.4–56.0) had more than 12 years of education, 52.2% (95% CI 52.0–52.5) drank alcohol three months before pregnancy, 7.0% (95% CI 6.9–7.2) drank in the last three months of pregnancy, and 4.5% (95% CI 4.3–4.6) were physically abused before pregnancy.

Overall, 75.2% (95% CI 75.0–75.5) of women with a recent live birth reported receiving an HIV test during pregnancy or at delivery. The prevalence of HIV testing varied by state and ranged from 42.6% (95% CI 41.7–43.5) in Utah to 91.8% (95% CI 91.0–92.6) in New York (NY); an analysis of annual state HIV testing rates is provided elsewhere.[11] Nationally, the prevalence of HIV testing by year ranged from 71.9% (95% CI 71.2–72.7) in 2013 to 77.5% (95% CI 76.878.1) in 2005. Compared to unmarried women (85.3%; 95% CI 85.1–85.7), fewer married women reported testing (68.8%; 95% CI 68.5–69.1); compared to black women (90.0%; 95% CI 89.6–90.4) or women of other race (77.4%; 95% CI 76.8–78.0), fewer white women (72.5%; 95% CI 71.2–71.8) reported testing. Other characteristics associated with lower reported rates of HIV testing in bivariate analysis include Hispanic ethnicity, Medicaid or WIC coverage, age, education, parity, income, intendedness of pregnancy, smoking in the last trimester, and prenatal care quantity and timing (Kessner index[16]) (Table 1).

When examining differences by state, NY had the highest testing rate (91.8%). Subgroup HIV testing differences were smaller in NY than in the other states. In NY, 94.5% (95% CI 93.2–95.7) of women with Medicaid and WIC, 92.1% (95% CI 88.9–95.2) of women with Medicaid only, 92.1% (95% CI 89.5–94.7) of women with WIC only, 90.0% (88.9–91.2) of women with neither Medicaid nor WIC, 94.5% (95% CI 93.3–95.6) of unmarried women, 90.0% (95% CI 89.0–91.1) of married women, 94.0% (95% CI 91.6–96.4) of black women, 91.3% (95% CI 90.4–92.2) of white women, 92.3% (95% CI 90.2–94.4) of women of other races, and 94.7% (95% CI 92.9–96.4) of Hispanic women were tested for HIV prenatally or during delivery.

In multivariable analyses, marital status, race, ethnicity, Medicaid/WIC status, parity, and smoking in the last trimester remained significantly associated with HIV testing; four interactions (marital status with race, marital status with ethnicity, and marital status with parity; and Medicaid/WIC status with parity) remained significant (Table 2). Married white women were 57% (aPR = 1.57, 95% CI 1.52–1.63) more likely, married black women were 27% (aPR = 1.27, 95% 1.17–1.38) more likely, and married women of other races were 25% (aPR = 1.25; 95% CI 1.17–1.33) more likely to report not getting a test compared their same-race, unmarried counterparts. Married Hispanic women were 32% (aPR = 1.32; 95% CI 1.24–1.42) more likely and married non-Hispanic women were 52% (aPR = 1.52; 95% CI 1.48–1.57) more likely to report no testing compared to their same-ethnicity, unmarried counterparts. Combined, women who were unmarried, non-white, Hispanic, or primiparous reported testing at 87.5% (95% CI 86.9–88.1), while 61.9% (95% CI 61.4–62.4) of women who were married, white, or multiparous reported testing. Women who were married, white, non-Hispanic, and multiparous (27% of the PRAMS sample) were 23% more likely to report not getting an HIV test than all other women combined.

In state-specific multivariable analyses, the following characteristics remained significantly associated with HIV testing during pregnancy or at delivery in the following number of states; marital status: 35 of 37 states (95%); race: 30 of 35 states (86%); Medicaid/WIC receipt: 31 of 37 states (84%); smoking: 23 of 37 states (62%); ethnicity: 21 of 37 states (57%); parity: 24 of 37 states (65%) (Table 3).

Discussion

Among women with a recent live birth who participated in PRAMS during 2004–2013, the overall rate of HIV testing during pregnancy or at delivery was 75%, which is similar to the rate found in 2006,[9] similar to two smaller analyses using claims data from 2007 (62%) and 2008 (74.1%) that also examined syphilis testing,[18,19] and similar annually to the year-by-year analysis of 2004–2011 PRAMS data in a companion article.[11] There has been no appreciable change since ACOG released universal testing recommendations in 2004, which were updated in 2008 and in 2015,[4] or since 2004–2006, when CDC revised recommendations on HIV testing to state that all pregnant women should be tested as early as possible during each pregnancy.[3,5]

We found differences in testing rates during pregnancy or delivery among certain subpopulations of women. Married, multiparous, white, non-Hispanic women were less likely to report testing than their counterparts; we found significant interactions between several of these variables, which may not have been elucidated in studies with smaller sample sizes. The characteristics associated with self-report of nonreceipt of an HIV test included marital status, race, Hispanic ethnicity, Medicaid/WIC status, parity, and smoking in the last trimester of pregnancy. In comparison, in 2005–2006, medical records from 4762 pregnant women were reviewed for documentation of HIV testing; 74% had evidence of testing before delivery. Women who did not have documentation of testing were more likely to be non-Hispanic, white, and use non-Medicaid insur-ance,[9] similar to our findings. Characteristics we identified as significant on bivariate analysis are consistent with another study.[10] An analysis of 2002 NSFG data found an overall reported testing rate during prenatal care of 69%; women less likely to report an HIV test were those reporting higher (versus lower) income and those with some college education (versus not completing high school).[10] The study's small sample size of 768 women, however, may have limited the ability to assess multiple characteristics and interactions. Education and income, while significant in univariate analysis, dropped from our multivariate model.

Compared to all other women in the sample, women who were married, white, non-Hispanic, and multiparous were 23% less likely to report testing. Providers may consider married, white, and non-Medicaid or WIC-receiving women to be at low risk for HIV. However, the emergence of local HIV transmission, including to pregnant women, associated with parenteral opioid drug use in a predominantly rural, white county in Indiana indicates that undetected transmission may be occurring among women considered 'low risk.'[20] The reasons for the lower testing rate among married, white, non-Hispanic, and multiparous women are unclear but may involve differences in individual or health care systems approaches to prenatal care: biases by providers or care systems, and policies differentially applied or implemented. Research to describe factors leading to no testing among different groups of women, even those who reported higher rates, may provide insight into potential interventions to improve testing rates.

The Healthy People 2020 target for HIV prenatal testing is 79.5%.[21] Our analysis indicates that testing rates are near this target (75.3%). CDC estimated that there were still more than 8000 women of reproductive age who were diagnosed with HIV infection in 2014.[2] Because

U.S. women and their infants continue to become infected with HIV, efforts are needed to increase testing, especially in the populations we identified as having low testing coverage. HIV testing is cost effective (savings are greater than costs) at a rate of 7.5/100,000 or one out of 13,333 pregnant women.[8] Previous publications suggest the 'opt-out' approach, in which all women are tested unless they specifically opt out of testing, could maximize routine screening to provide universal HIV testing. This approach limits the need for lengthy counseling and may improve testing rates despite lingering stigma.[5,22] Fitz Harris et al. analyzed PRAMS data by year (2004–2012) and assessed the effect of state policies or laws in the last ten years to improve testing. They found that areas where testing rates have increased implemented policy changes, passed laws, or worked with providers on quality initiatives that may have led to increased testing.[11] Areas where HIV testing has remained stable or decreased may benefit from implementing successful activities.

Because PRAMS data are self-reported and women may be screened as part of routine prenatal care on an opt-out basis, some women may not know that they have been tested for HIV, particularly if health care providers do not discuss negative test results. Therefore, this analysis may underestimate actual testing. PRAMS does not ask about repeat testing during pregnancy (or about infant testing), so we could not assess adherence to the repeat testing recommendation. The sensitivity and specificity of the PRAMS HIV testing question was examined by comparing PRAMS data to medical records in New York City and Vermont in 2009.[23] The authors found that the sensitivity (women who reported testing to PRAMS, of all women tested) was 89.6 and 67.7%, the specificity (women reporting no testing to PRAMS, of all women not tested) 14.7 and 61.6%, and the positive predictive value 98.3 and 90.8% in NYC and Vermont, respectively. We only analyzed the 'yes' responses to indicate testing and did not analyze the 'no' responses. Based on the published sensitivity, we likely underestimate the true prevalence of HIV testing during pregnancy or at delivery. If a correction from NY and VT were applied to other states, the testing rate reported here would be estimated at between 84 and 100%. However, testing rates using claims data found similar results to this analysis.[18,19]

Other limitations include the respondents' missing income data (n = 36,146), that not all states reported race, and that we did not assess subgroup trends by state. However, consistently significant differences among characteristics of women reporting HIV testing across states suggest that testing is not uniform. Women may decline testing if they recall that they have been tested in the recent past.[24] Current recommendations state that women at high risk for HIV should be tested twice during pregnancy.[4,5] PRAMS does not distinguish between prenatal or delivery testing, nor assess whether high-risk women are getting a second test in the third trimester, as is currently recommended.

These data represent 36 states and one city; notably, because of low response rates, several southern states participating in PRAMS did not contribute data or did not contribute each year (see Appendix A in online supplemental files). While 2002 data from NSFG found higher testing rates in southern states,[10] year-to-year variations in state-specific testing rates from 2004 to 2011 are available and southern states had lower testing rates in more recent years.[11] Inclusion of data from these states might have lowered the estimate. Despite these

limitations, our data suggest that improvements in HIV testing coverage are possible, particularly among subpopulations often considered low risk and certain states.

In summary, in this PRAMS analysis, we found that during 2004–2013, one out of every four women with a recent live birth reported not being tested for HIV during pregnancy or at delivery. The testing rate has not changed substantially in the last ten years.[11] HIV testing is cost effective and universal testing is recommended by ACOG and CDC; local efforts to implement universal HIV testing may reduce differences in testing rates between subpopulations and further reduce perinatal transmission.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Characteristics of women and proportion reporting HIV testing in the Pregnancy Risk Assessment Monitoring System, 2004–2013.[a,b]

	Total All States		Women tested for HIV	
Characteristics	**n**	**%[c] (95% CI)**	**n**	**%[d] (95% CI)**
Overall	334,166	–	244,524	75.3 (75.0–75.5)
Maternal age[e]				
<25 years	112,634	32.1 (31.8–32.3)	88,534	80.9 (80.6–81.3)
25–34 years	170,133	53.4 (53.1–53.7)	120,412	72.9 (72.6–73.3)
35–49 years	51,381	14.5 (14.3–14.7)	35,563	71.3 (70.7–72.0)
Race				
White	203,834	70.9 (70.6–71.1)	141,298	71.5 (71.2–71.8)
Black	58,945	16.3 (16.1–16.4)	51,730	90.0 (89.6–90.4)
Other	71,387	12.9 (12.7–13.1)	51,496	77.4 (76.8–78.0)
Ethnicity				
Hispanic	47,919	16.9 (16.8–17.1)	38,284	83.8 (83.2–84.3)
Non-Hispanic	286,247	83.1 (82.9–83.2)	206,240	73.5 (73.3–73.8)
Education				
0–11 years	56,616	17.3 (17.1–17.5)	45,397	82.2 (81.7–82.8)
12 years	93,939	27.0 (26.7–27.2)	72,469	79.4 (79.0–79.9)
> 12 years	179,094	55.7 (55.4–56.0)	123,340	71.0 (70.7–71.3)
Marital status				
Married	199,599	60.9 (60.7–61.2)	132,974	68.8 (68.5–69.1)
Other	134,567	39.1 (38.8–39.3)	111,550	85.4 (85.1–85.7)
Income[f]				
Less than $15,000	95,968	29.2 (28.9–29.4)	77,906	83.7 (83.3–84.1)
$l5,000-$50,000	109,142	34.8 (34.5–35.1)	79,276	74.8 (74.4–75.2)
$50,000 or More	98,891	36.0 (35.7–36.3)	64,160	67.5 (67.1–68.0)
Parity				
First birth	144,915	42.0 (41.7–42.3)	108,782	77.5 (77.2–77.9)

Characteristics	Total All States		Women tested for HIV	
	n	%[c] (95% CI)	n	%[d] (95% CI)
Second or higher	185,813	58.0 (57.7–58.3)	133,110	73.6 (73.3–73.9)
Pregnancy intention[g]				
Intended	186,510	58.8 (58.5–59.1)	130,036	71.9 (71.6–72.3)
Unintended	133,503	41.2 (40.9–41.5)	103,933	80.1 (79.7–80.4)
Smoked last three months of pregnancy				
Yes	46,303	11.5 (11.4–11.7)	37,314	82.0 (81.3–82.6)
No	284,328	88.5 (88.3–88.6)	204,517	74.4 (74.1–74.6)
Medicaid/WIC pregnancy[h]				
Medicaid only	32,331	9.5 (9.3–9.6)	24,551	78.4 (77.7–79.1)
WIC only	31,463	8.7 (8.5–8.8)	24,181	79.2 (78.5–80.0)
Medicaid and WIC	128,256	36.8 (36.6–37.1)	103,858	83.8 (83.5–84.1)
Neither Medicaid nor WIC	141,324	45.0 (44.8–45.3)	91,389	66.9 (66.5–67.3)
Kessner Index				
Adequate PNC	223,348	66.8 (66.5–67.0)	160,238	74.0 (73.7–74.3)
Intermediate PNC	69,772	20.3 (20.0–20.5)	53,109	77.9 (77.4–78.4)
Inadequate PNC	19,297	5.4 (5.3–5.6)	14,778	78.9 (77.9–79.9)
Unknown PNC	21,749	7.5 (7.4–7.7)	16,399	76.7 (75.7–77.6)

CI: confidence interval; PNC: pre-natal care; WIC: Special Supplemental Nutritional Program for Women, Infants, and Children.

[a] All characteristics are significant at $P<.01$ using Chi square test.

[b] Due to missing values, the sample sizes varied across analyses (Maternal age: n = 387,402 [22 missing values]; Income: n = 351,278 [36,146 missing values]; Parity: n = 382,990 [4434 missing values]; Pregnancy intention: n = 369,903 [17,521 missing values]; Smoked last trimester: n = 381,506 [5918 missing values]; Medicaid/WIC Pregnancy: n = 384,782 [2642 missing values]).

[c] Column percent.

[d] Row percent.

[e] Age at birth of infant.

[f] We categorized income as less than $15,000 if the PRAMS participant reported income between $0 and $15,000, less than $10,000, $8000–$9999, $10,000–$ 14,999, $0–$18,000, or $0–$17,000. We categorized income as $15,000–$50,000 if the PRAMS participant reported income between $15,000 and $52,000, $18,000 and $56,000, $17,001 and $51,000, or $15,000 and $49,999. We categorized income as greater than $50,000 if the PRAMS participant reported income as greater than $52,000, greater than $56,000, greater than $51,000, or greater than $50,000.

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[g] Women who indicated they wanted their recent pregnancy ‘sooner’ or ‘then’ were classified as having an intended pregnancy, and those who answered ‘later,’ ‘did not want,’ or ‘did not want at any time’ were classified as unintended.

[h] Since questions assessing insurance coverage during pregnancy and delivery changed during 2004–2013, women who answered ‘yes’ to the question about whether they had Medicaid (2004–2007), answered ‘Medicaid’ to the question about the type of insurance for prenatal care and delivery (2008–2011), or answered ‘Medicaid’ to the question about the type of insurance during prenatal care (2011-2013), were classified as having Medicaid.

Table 2.

Adjusted prevalence ratios (aPRs) and 95% confidence intervals for not reporting an HIV test during pregnancy or at delivery, Pregnancy Risk Assessment Monitoring System, 2004–20l3.

	Not tested for HIV	
	aPR	**95% CI**
Smoked in the last three months of pregnancy	1.31	1.25–1.37
Race*marital status		
White: married versus unmarried	1.57	1.52–1.63
Black: married versus unmarried	1.27[a]	1.17–1.38
Other: married versus unmarried	1.25[a]	1.17–1.33
Ethnicity*marital status		
Hispanic: married versus unmarried	1.32	1.24–1.42
Non-Hispanic: married versus unmarried	1.52	1.48–1.57
Parity*marital status		
First birth: married versus unmarried	1.39	1.33–1.45
Second birth or higher: married versus unmarried	1.57	1.51–1`.64
Insurance*parity		
Medicaid only or WIC only: second or higher versus first	1.12[b]	1.07–1.18
Medicaid and WIC: second or higher versus first	1.03[b]	0.99–1.08
Neither Medicaid nor WIC: second or higher versus first	1.22	1.19–1.26

CI: confidence interval; WIC: Special Supplemental Nutritional Program for Women, Infants, and Children.

[a]The ratio of aPR (Other race: Married versus Other) ÷ aPR (Black: Married versus Other) is not significantly different from l (95% CI: 0.89–1.09).

[b]The ratio of aPR (‘Medicaid only or WIC only’: second or higher versus first birth) ÷ aPR (Medicaid & WIC: second or higher versus first birth) is significantly different from l (95% CI: 1.02–1.16).

Table 3.

State-specific characteristics associated with not reporting an HIV test during pregnancy or at delivery, Pregnancy Risk Assessment Monitoring System (PRAMS) - 2004–2013.

State	Size of PRAMS sample	Marital status	Race	Medicaid	Smoking	Ethnicity	Parity	Age	Income	Intendedness	Education	Kessner
Oklahoma	19,594	Y	Y	Y	Y	NS	NS	Y	NS	NS	NS	NS
Colorado	18,775	Y	Y	Y	NS	Y	Y	NS	NS	Y	NS	NS
Utah	17,166	Y	Y	Y	Y	Y	Y	NS	NS	Y	Y	NS
Oregon	16,837	Y	Y	Y	Y	Y	Y	NS	NS	NS	NS	NS
Hawaii	16,693	Y	Y	Y	NS	Y	Y	Y	NS	NS	NS	NS
Nebraska	16,645	Y	Y	Y	Y	Y	Y	Y	NS	NS	Y	NS
New Jersey	16,066	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	NS
Arkansas	15,875	Y	Y	Y	Y	NS	NS	NS	NS	NS	NS	NS
Illinois	15,859	Y	Y	Y	NS	Y	Y	NS	NS	NS	NS	NS
Michigan	15,672	Y	Y	Y	Y	Y	Y	NS	Y	NS	NS	NS
West Virginia	15,028	Y	Y	Y	Y	NS	NS	Y	NS	NS	Y	NS
Maryland	14,872	Y	Y	Y	Y	Y	NS	Y	NS	NS	NS	NS
Minnesota	14,177	Y	Y	Y	Y	NS	Y	NS	NS	NS	NS	NS
Washington	13,830	Y	Y	Y	Y	Y	Y	NS	NS	NS	NS	NS
Rhode Island	13,200	Y	Y	Y	Y	Y	Y	Y	Y	NS	NS	NS
Georgia	12,722	Y	Y	Y	NS	NS	Y	NS	NS	Y	NS	NS
Alaska	11,595	Y	Y	Y	Y	Y	Y	NS	NS	NS	NS	NS
Vermont	10,732	Y	NA	Y	Y	NA	Y	Y	Y	NS	Y	NS
Maine	10,631	Y	NS	Y	Y	NS	Y	NS	Y	NS	Y	NS
New York City	10,612	Y	Y	NS	NS	Y	Y	Y	NS	Y	NS	NS
Ohio	10,341	Y	Y	Y	Y	NS	Y	NS	NS	NS	Y	NS
New York	8399	Y	NS	Y	NS	NS	NS	Y	NS	NS	NS	NS
Wisconsin	7682	Y	Y	Y	Y	Y	Y	NS	NS	NS	NS	NS
Missouri	7575	Y	Y	Y	Y	NS	NS	NS	NS	NS	NS	NS
Delaware	7224	Y	Y	Y	Y	Y	NS	NS	NS	NS	NS	Y
Pennsylvania	6809	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS

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State	Size of PRAMS sample	Marital status	Race	Medicaid	Smoking	Ethnicity	Parity	Age	Income	Intendedness	Education	Kessner
New Mexico	6608	Y	NS	Y	Y	Y	NS	NS	NS	NS	NS	NS
Wyoming	5696	Y	NS	NS	Y	Y	Y	Y	NS	NS	NS	NS
North Carolina	5669	Y	Y	Y	NS	Y	Y	NS	NS	NS	NS	NS
South Carolina	5474	Y	Y	Y	NS	NS	NS	Y	NS	NS	NS	NS
Mississippi	5248	Y	Y	NS	Y	NS	NS	NS	NS	NS	NS	Y
Florida	4212	Y	Y	Y	NS	NS	Y	NS	NS	NS	NS	NS
Texas	3291	NS	Y	Y	NS	NS	NS	NS	NS	NS	NS	NS
Tennessee	3149	Y	Y	Y	NS	NS	NS	NS	NS	NS	NS	NS
Louisiana	1659	Y	NS	NS	NS	NS	Y	Y	NS	NS	NS	NS
Iowa	1168	Y	Y	NS	NS	NS	Y	NS	NS	NS	NS	NS
New Hampshire	639	NS	IS	NS	NS	IS	NS	NS	NS	NS	Y	NS

IS: insufficient sample to evaluate this variable; NA: variable not available in this state; NS: not significantly associated with not reporting an HIV test during pregnancy or at delivery; Y: significantly associated with not reporting an HIV test during pregnancy or at delivery, similar in size and in same direction as overall univariate results.