Prenatal Discussion of HIV Testing and Maternal HIV Testing—14 States, 1996-1997

IN JULY 1995, THE PUBLIC HEALTH SERVICE recommended that health-care providers counsel all pregnant women about human immunodeficiency virus (HIV) prevention and encourage testing for HIV infection and, if indicated, initiate zidovudine therapy. To evaluate compliance with these recommendations, CDC analyzed population-based data on HIV counseling and testing during 1996-1997 from 14 states participating in the Pregnancy Risk Assessment Monitoring System (PRAMS). This report presents an analysis of survey data collected from 1996 through 1997; results indicate that HIV counseling and testing of pregnant women were common but varied by state, type of prenatal health-care provider, Medicaid status, and maternal demographic characteristics.

PRAMS is an ongoing, state-based surveillance system that collects information about maternal behaviors, attitudes, and experiences. Each month, PRAMS surveys a random sample of mothers who have given birth to live infants during the previous 2-6 months using stratified, systematic sampling of resident birth certificates. A questionnaire is mailed to each mother, and a follow-up questionnaire is mailed to nonrespondents. Nonrespondents then are contacted by telephone. Statistical weights are applied to account for sampling probability, nonresponse, and sampling frame coverage in each state. The annual state-specific response rate to the entire questionnaire for 11 states in 1996 and 13 states in 1997 was approximately 70% (range: 69.4%-80.0%). Details of the survey design, questionnaire, and other operational aspects of the survey have been published.

Beginning in 1996, mothers who received prenatal care were asked whether a doctor, nurse, or other health-care provider counseled them about testing for HIV. Mothers in eight states, regardless of whether they received prenatal care, were asked if they had been tested for HIV infection during pregnancy or at delivery. Mothers who received any prenatal care and responded to the provider test discussion question were included in the analysis (n = 17,354 [97.4%] in 1996; n = 19,693 [98.1%] in 1997). To analyze maternal HIV testing, data were included on all mothers who responded to the HIV testing question regardless of having received prenatal care (n = 8420 [89.8%] in 1996; n = 11,152 [91.0%] in 1997). To account for the complex survey design, SUDAAN was used to calculate point estimates, risk ratios, and 95% confidence intervals (CIs) surrounding the risk ratios. State-specific risk ratios were considered significant if the 95% CI did not include 1. State-specific risk ratios are not presented for sparse data (response categories with <20 women).

During 1997, the state-specific proportion of mothers who recalled discussing HIV testing with their prenatal health-care provider ranged from 63.4% (Maine) to 86.7% (North Carolina), and the proportion of mothers who recalled being tested ranged from 58.0% (Oklahoma) to 80.7% (Florida). Among 10 states with data from 1996 to 1997, increases in testing discussions occurred in New York (22.8%), Oklahoma (17.8%), and West Virginia (15.3%). Seven states demonstrated no increases (range: -2 to 0.9%) in prenatal testing discussions. The largest increase in reporting of maternal testing from 1996 to 1997 occurred in New York (18.1%). Smaller increases occurred in West Virginia (15.2%), Florida (14.3%), Oklahoma (11.5%), and Georgia (6.5%).

During 1997 in all states, black mothers were significantly more likely than white mothers to report that their provider discussed testing (risk ratio [RR] = 1.05-1.29). Hispanic mothers were not significantly more likely to report having had a testing discussion in most states. In seven states, mothers with less than a high school education were significantly more likely (RR = 0.96-1.22) to recall a discussion about testing. Similarly, in 11 states, mothers aged <25 years were significantly more likely to recall a discussion about testing (RR = 1.04-1.25). Public health-care providers were more likely than private providers to discuss testing (RR = 0.96-1.29) in 10 states. In 11 states, mothers who received Medicaid benefits during pregnancy were significantly more likely to report discussions with a health-care provider (RR = 0.99-1.32).

In most states, black race, type of prenatal health-care provider, education level, age, and receipt of Medicaid benefits were associated significantly with maternal HIV testing. However, associations between maternal characteristics and testing discussions were stronger than associations between maternal characteristics and actual testing.

**CDC Editorial Note:** This report documents a substantial level of counseling about HIV testing and receipt of testing for women who have given birth since publication of the 1995 guidelines. In 1997, >70% of women in nine states recalled discussing HIV testing with their health-care provider during prenatal care, and at least 50% of women in all states reported being tested for HIV during pregnancy or at delivery.

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Data from PRAMS suggest that physician practices regarding prenatal HIV testing discussions and prenatal maternal HIV testing may be influenced by state-specific variations in HIV seroprevalence rates among childbearing women and physician perceptions of maternal HIV risk factors. Health-care providers serving women in states with high HIV seroprevalence rates may be more aware of HIV prevention and may place higher priority on prenatal HIV prevention. For example, on average, fewer mothers (69.2%) in low HIV seroprevalence states (HIV seroprevalence rate among pregnant women <0.05%) recalled a discussion about testing compared with mothers (81.4%) in high seroprevalence states (seroprevalence rate >0.4%).4 Maternal HIV testing demonstrated a similar association; fewer mothers (58.0%) in low seroprevalence states were tested compared with mothers (70.9%) in high seroprevalence states. Variations in testing discussions by maternal race, age, and Medicaid status may reflect targeted testing efforts by providers on the basis of known epidemiology of HIV among women in their area. In addition, perception of the mother’s risk may influence whether a provider discusses HIV testing.

Differences in state legislation also may contribute to variations in HIV discussions and testing. During 1996, Florida and New York enacted legislation requiring that all health-care providers include HIV counseling during prenatal care. High levels of provider discussions on HIV testing may be influenced by legislation mandating this activity before 1996. In July 1997, Arkansas law required that providers test all pregnant women for HIV; however, that legislation probably did not affect results presented in this report. An association among legislation, discussions, and actual HIV testing cannot be established using PRAMS data.5

Another survey has shown increased test counseling for women who were young and other than white, sought care from a public provider, and had low incomes.6 PRAMS data also are consistent with a provider survey that found variations in prenatal test counseling according to provider type (i.e., public versus private) and type of patient insurance (i.e., Medicaid versus other).7

The findings in this report are subject to at least four limitations. First, information about previous HIV testing among mothers and the testing date, if any, were not available. Second, the wording of the survey questions did not allow consideration of a cause-effect relationship between provider test counseling and maternal test acceptance. Third, information was not collected on maternal risk for HIV infection, context of test counseling (i.e., strength of provider encouragement), or reasons a mother refused testing. Finally, data were not available to estimate self-reported information accuracy; however, most respondents completed the questionnaire within 4 months of the infants’ delivery, minimizing recall bias.

Data from this survey permit health-care professionals and policymakers to monitor ongoing health-care provider counseling and maternal testing. The results described in this report emphasize the need for increasing health-care providers’ awareness of HIV testing during prenatal care to ensure that health-care providers counsel all pregnant women.

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Determination of Nicotine, pH, and Moisture Content of Six US Commercial Moist Snuff Products—Florida, January-February 1999

MMWR. 1999;48:398-401

1 table omitted

THE USE OF SMOKELESS TOBACCO (MOIST snuff and chewing tobacco) can cause oral cancer and precancerous oral lesions (leukoplakia) and is a risk factor for cardiovascular diseases and nicotine addiction.1 Despite these adverse effects, smokeless tobacco is used commonly in the United States by young people, especially male high school students.2 Officials in Florida requested CDC assistance in analyzing six moist snuff products to measure three factors that affect their nicotine dose: pH, nicotine content, and moisture content. This report summarizes the results of the analysis, which indicate that the pH, amount of nicotine, and moisture vary widely among brands.

During January 5-February 7, 1999, University of Miami staff and affiliated persons bought six smokeless tobacco products from stores in Daytona Beach, Fort Myers, Miami, Orlando, Tallahassee, and Tampa/St. Petersburg, Florida. These products were Copenhagen Snuff, Skoal Bandits Straight, Skoal Bandits Wintergreen, Skoal Long Cut Wintergreen, Kodiak Wintergreen, and Hawkwen Wintergreen,3 and were chosen to reflect a

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cross-section of products from the five leading U.S. moist snuff brands sold in the United States during 1997.\(^3\)

The pH, nicotine, and total moisture content in samples of the six products were analyzed at CDC using a federal standard protocol.\(^4\) Samples were stored in their original containers at -95.8 F (-71 C) until tested. The pH was obtained by suspending 2 g of moist snuff in 10 mL distilled water. Total moisture content (water and tobacco constituents that are volatile at 211.1 F [99.5 C]) was obtained by calculating the weight difference in 5 g of tobacco before and after 3 hours of oven drying at 211.1 F (99.5 C). Nicotine was extracted from moist snuff by using methyl tert butyl ether, and tobacco extracts were analyzed by gas chromatography to determine the nicotine content. The nicotine extraction and pH measurements were conducted at room temperature. The percentage of free (unprotonated) nicotine, which is dependent on the pH, was calculated according to the Henderson-Hasselbalch equation and by using a pH value of 8.02 for nicotine.\(^5\) Free nicotine content then was calculated by multiplying the percentage of free nicotine by the total nicotine content (percentage of free nicotine x nicotine content). The tests were not blinded to the brands being tested, and all analyses were done in triplicate. Statistical analyses were performed using Statistical Analysis System (SAS) software.

The mean total moisture content ranged from 48.9% to 54.1%, except Hawken Wintergreen, which had a mean total moisture content of 24.7%; the mean nicotine content varied from 7.11 mg/g to 11.04 mg/g, except Hawken Wintergreen, which had a mean nicotine content of 3.37 mg/g; the mean pH varied from 5.24 (Hawken Wintergreen) to 8.35 (Kodiak Wintergreen). The mean amount of nicotine per dry tobacco weight ranged from 0.45% (Hawken Wintergreen) to 2.41% (Skol Long Cut Wintergreen). Mean free nicotine levels varied from 0.01 mg/g (Hawken Wintergreen) to 6.23 mg/g (Copenhagen Snuff). The percentage of free nicotine varied from a mean value of 0.23% (Hawken Wintergreen) to 68.14% (Kodiak Wintergreen).

**CDC Editorial Note:** The findings in this report indicate that substantial differences exist in the pH, the amount of moisture and nicotine, and the percentage of free nicotine among six commonly used U.S. smokeless tobacco products bought at several locations in Florida. The nicotine dose smokeless tobacco users receive may be controlled by adjusting the concentration of nicotine, varying the size of tobacco cuttings, and altering the pH.\(^6\) The pH in tobacco strongly affects nicotine absorption through the nose and mouth, especially free nicotine, the chemical form most readily absorbed across the buccal mucosa into the bloodstream.\(^7\) Although pH is a determinant of nicotine absorption, other factors can modulate the absorption rate (e.g., amount of moist snuff used and behavioral and physiologic factors unique to each user); however, these factors probably have little effect on the nicotine absorption rate.\(^7\) Among the 562 compounds reported on the smokeless tobacco ingredient list,\(^8\) several salts (e.g., ammonium, sodium, and potassium) may alter the pH of smokeless tobacco. The findings in this report confirm that products with high nicotine content and high pH have a high percentage of free nicotine.

The findings in this report are subject to at least two limitations. First, the analysis did not use a sales-weighted or representative sample of all U.S. brands or manufacturers; the moist snuff products tested were six leading products manufactured by the two industry leaders. Second, the findings for any specific brand could have been affected by factors unique to the sample delivered to each city surveyed, such as the retailers’ duration and conditions of storage (e.g., humidity and temperature) and manufacturing dates.

This study is a new federal analysis of pH, moisture, and nicotine content of smokeless tobacco that quantifies a wide range of nicotine dosing capabilities in moist snuff products. These findings are consistent with other studies\(^6\)\(^9\) that have found a wide variation in the nicotine dosing capabilities of these products. The Food and Drug Administration previously found that smokeless tobacco contains components intended to control the delivery of nicotine to the body.\(^10\) Smokeless tobacco users who dip or chew eight to 10 times a day may be exposed to the same amount of nicotine as persons who smoke 30 to 40 cigarettes a day.\(^1\) In addition, smokeless tobacco contains known cancer-causing agents: nitrosamines, polycyclic aromatic hydrocarbons, and radioactive polonium.\(^1\) These findings underscore the need for intensive efforts to prevent children and adolescents from using any tobacco product, including smokeless tobacco, and to educate young users about the risks associated with smokeless tobacco.

**REFERENCES**

10 available

*Use of trade names and commercial sources is for identification only and does not imply endorsement by U.S. Department of Health and Human Services or CDC.

† The protocol for determining pH, total moisture, and nicotine content used in this analysis was published as a notice to solicit public comment on the protocol in the Federal Register (62 FR 24116, May 2, 1997). The final version of the protocol was published in the Federal Register on March 23, 1999. The differences between the two protocols are minor and would not affect the results of this study; however, the sampling of the products for this study is different from that required by the protocol.