Letters

Trends in Marijuana Use Among Pregnant and Nonpregnant Reproductive-Aged Women, 2002-2014

Between 2001 and 2013, marijuana use among US adults more than doubled, many states legalized marijuana use, and attitudes toward marijuana became more permissive.[1] In aggregated 2007-2012 data, 3.9% of pregnant women and 7.6% of nonpregnant reproductive-aged women reported past-month marijuana use.[2] Although the evidence is mixed, human and animal studies suggest that prenatal marijuana exposure may be associated with poor offspring outcomes (eg, low birth weight, impaired neurodevelopment).[3] The American College of Obstetricians and Gynecologists recommends that pregnant women and women contemplating pregnancy be screened for and discouraged from using marijuana and other substances.[4] Whether marijuana use has changed over time among pregnant and nonpregnant reproductive-aged women is unknown.

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Methods | The Columbia University Medical Center institutional review board waived review of this study. Informed oral consent was obtained from each participant. Data from women aged 18 through 44 years from the annual National Survey on Drug Use and Health (NSDUH) from 2002 through 2014 were analyzed. The surveys used in-person audio computer-assisted self-interviews (ACASI) about substance use and other behaviors in nationally representative samples of the noninstitutionalized US population; average response rates since 2002 were 75%.[5] Among participants reporting lifetime use of marijuana or hashish, recency of use was assessed with the question: "How long has it been since you last used marijuana or hashish?" Responses included "within the past 30 days," "more than 30 days ago but within the past 12 months," and "more than 12 months ago."[5] Among pregnant and nonpregnant women, log-Poisson regression (SUDAAN [RTI International], version 11.0.1) was used to estimate and test trends in the adjusted prevalences of past-month and past-year marijuana use over time, controlling for complex survey design, age, race/ethnicity, family income, and education. Differences in trends over time were examined by pregnancy status and age (18-25 years and 26-44 years). Results were considered statistically significant at a P value of less than .05 (2-sided).

Results | Of the 200 510 women analyzed, 29.5% were aged 18 through 25 years and 70.5% were aged 26 through 44 years; 61.0% were white, 13.7% black, 17.2% Hispanic, and 8.1% other race/ethnicity; 59.2% had some college education; 55.9% had annual family incomes less than $50 000; and 5.3% (n = 10 587) were pregnant.

Among all pregnant women, the adjusted prevalence of past-month marijuana use increased from 2.37% (95% CI, 1.85%-3.04%) in 2002 to 3.85% (95% CI, 2.87%-5.18%) in

Table. Trends in Prevalence of Marijuana Use in Pregnant and Nonpregnant Women, 2002-2014[a]

Marijuana Use Among Women	Adjusted Prevalence, No. (%) [95% CI][b]		Prevalence Ratio (95% CI)[e]	P Value for Difference in Prevalence Ratios[f]
	2002 (n = 15 284)[c]	2014 (n = 15 318)[d]		
Past month[g]				
Pregnant	40 (2.37) [1.85-3.04]	43 (3.85) [2.87-5.18]	1.62 (1.09-2.43)	.64
Nonpregnant	1531 (6.29) [6.02-6.57]	1673 (9.27) [8.90-9.65]	1.47 (1.38-1.58)	
Past year				
Pregnant	134 (8.64) [7.32-10.19]	115 (11.63) [9.78-13.82]	1.35 (1.05-1.72)	.73
Nonpregnant	2809 (12.37) [12.05-12.70]	2824 (15.93) [15.48-16.40]	1.29 (1.23-1.35)	

[a] Data were from the US National Survey on Drug Use and Health (NSDUH).

[b] Adjusted prevalence estimates are from the linear predicted prevalence model described in footnote a of the Figure.

[c] Sample sizes in 2002: pregnant women, n = 797; nonpregnant women, n = 14 487.

[d] Sample sizes in 2014: pregnant women, n = 735: nonpregnant women, n = 14 583.

[e] Prevalence ratios were the ratio of the adjusted prevalence estimates from 2014 divided by the adjusted prevalence estimates from 2002; ratios and 95% CIs were from log-Poisson regressions. CIs for prevalence ratios that did not include 1.00 within the lower and upper levels indicated statistically significant increasing trends in marijuana use.

[f] The test for difference in prevalence ratios was the P value of the

pregnancy × year interaction in the log-Poisson regression. This test indicated whether the ratio of the prevalence ratios for pregnant vs nonpregnant women differed significantly from 1.00. Nonsignificant P values ($P \geq .05$) indicated insufficient evidence to conclude that the prevalence ratios differ.

[g] Past-month marijuana use was defined as responding "within the past 30 days" to the question, "How long has it been since you last used marijuana or hashish?" Past-year marijuana use was defined as responses of "within the past 30 days" or "more than 30 days ago but within the past 12 months" to the aforementioned question. Preprocessing of missing variables by predictive mean neighborhood imputation and recoding was done prior to public release of the NSDUH data sets.[5] Because the analyses used the imputed variables of NSDUH, there were no missing data.

Figure. Year-to-Year Prevalence[a] of Past-Month Marijuana Use[b] Among Pregnant and Nonpregnant Women, Overall and by Age, 2002-2014[c]
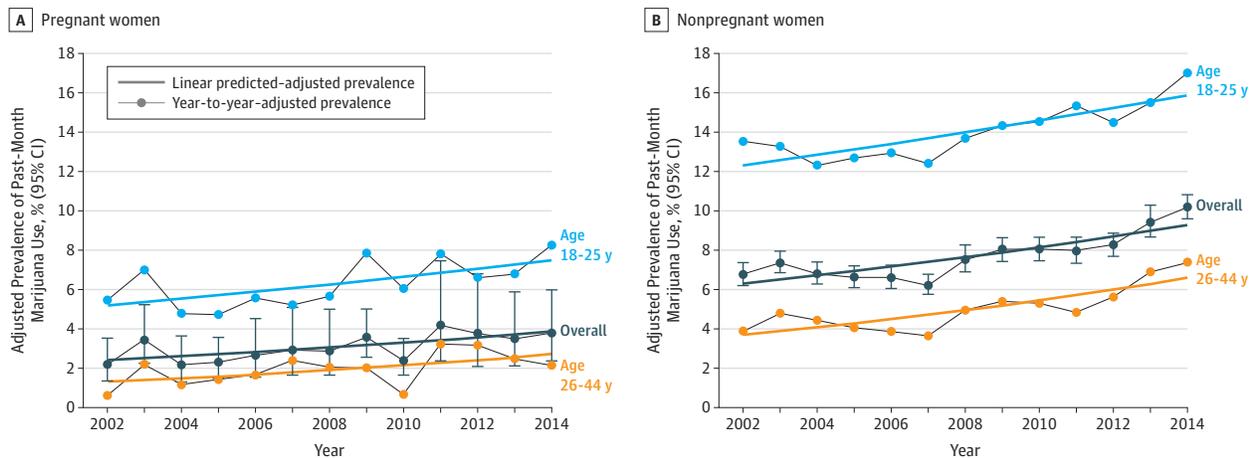
[a] Year-to-year–adjusted and linear predicted–adjusted prevalence estimates were from log-Poisson regressions. Models controlled for race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other non-Hispanic minorities), family income ($0-$19 999, $20 000-$49 999, $50 000-$74 999, ≥$75 000), age (18-25 years, 26-34 years, 35-44 years), education (<high school, high school, some college), year (year was categorical in the year-to-year model, and continuous in the linear predicted model), pregnancy status, pregnancy × year interaction, covariate × pregnancy interactions, and complex survey design. Error bars indicate 95% CIs and are only shown for overall year-to-year–adjusted prevalence estimates. Percentage of variability in dichotomous marijuana use explained by the

model with year as a continuous variable was 6% (McFadden pseudo-R^2); the ratio of the pseudo-R^2 statistics for the models with year as a continuous vs categorical variable was 0.98, indicating strong evidence for a linear trend.

[b] Past-month marijuana use was defined as responding "within the past 30 days" to the question, "How long has it been since you last used marijuana or hashish?"

[c] Data were from the US National Survey on Drug Use and Health. Sample size across all years combined: pregnant women (n = 10 587), nonpregnant women (n = 189 923).

2014 (prevalence ratio [PR], 1.62 [95% CI, 1.09-2.43]) (**Table**). The adjusted prevalence of past-month marijuana use was highest among those aged 18 to 25 years, reaching 7.47% (95% CI, 4.67%-11.93%) in 2014 (**Figure**), significantly higher (*P* = .02) than among those aged 26 to 44 years (2.12% [95% CI, 0.74%-6.09%]). However, increases over time did not differ by age (*P* = .76). Past-year use was higher overall, reaching 11.63% (95% CI, 9.78%-13.82%) in 2014, with similar trends over time.

In nonpregnant women, prevalences of past-month use (2014: 9.27% [95% CI, 8.90%-9.65%]) and past-year use (2014: 15.93% [95% CI, 15.48%-16.40%]) were higher overall, with similar trends over time. Increases over time in past-month marijuana use did not differ by pregnancy status (*P* = .64).

Discussion | Among pregnant women, the prevalence of past-month marijuana use increased 62% from 2002 through 2014. Prevalence was highest among women aged 18 to 25 years, indicating that young women are at greater risk for prenatal marijuana use. Study limitations are noted. Self-reported marijuana use may lead to underreporting due to social desirability and recall biases. However, use of ACASI helps reduce such biases,[5] and the increases over time observed in this study are consistent with increases over time in marijuana-related outcomes shown in other studies that did not rely on self-reports, supporting the validity of the findings.[6] Additionally, future studies should address dose, frequency of use, and clinical outcomes.

These results offer an important step toward understanding trends in marijuana use among women of reproductive age. Although the prevalence of past-month use among pregnant women (3.85%) is not high, the increases over time and potential adverse consequences of prenatal marijuana exposure[3] suggest further monitoring and research are warranted. To ensure optimal maternal and child health, practitioners should screen and counsel pregnant women and women contemplating pregnancy about prenatal marijuana use.

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