Trends in Self-reported and Biochemically Tested Marijuana Use Among Pregnant Females in California From 2009-2016

Marijuana is the most commonly used illicit drug during pregnancy, and its use is increasing. From 2002 to 2014, the prevalence of self-reported, past-month marijuana use among US adult pregnant women increased from 2.4% to 3.9%. In aggregated 2002-2012 data, 14.6% of US pregnant adolescents reported past-month use. However, studies are limited to self-reported surveys and likely underestimate use due to social desirability bias and underreporting, leaving the scope of the problem unclear. We investigated trends of prenatal marijuana use from 2009-2016 using data from a large California health care system with universal screening via self-report and urine toxicology.

Methods | The Kaiser Permanente Northern California (KPNC) institutional review board approved and waived consent for this study. KPNC is an integrated health care system serving approximately 4 million patients representative of the geographic area. The sample comprised KPNC pregnant females 12 years or older who completed a self-administered questionnaire on marijuana use since pregnancy and a cannabis toxicology test (58% occurred at the same visit as the questionnaire, 87% occurred within 2 weeks of completing the questionnaire) during standard prenatal care (at approximately 8 weeks’ gestation) from 2009 through 2016.

We estimated the adjusted prevalence of prenatal marijuana use via self-report or toxicology annually using Poisson regression with a log link function, controlling for age, race/ethnicity, and median neighborhood household income using SAS (SAS Institute), version 9.3. Adjusted prevalence estimates used the average covariate distributions across the study period. We tested for linear trends and differences in trends by age. Two-sided P values less than .05 were considered statistically significant.

Results | Of 31 8085 pregnant females, 38 628 (12.1%) were excluded (1123 who missed the self-reported screening questionnaire [0.4%], 37 303 who missed a toxicology test [11.7%], and 202 who missed both [0.06%]). The race/ethnicity of the 279 457 females (87.9%) included in the study was 36.0% white, 27.9% Hispanic, 16.6% Asian, 5.9% black, and 13.6% other. The age ranges of the sample included females aged 12 to 17 years (1.4%), 18 to 24 years (15.8%), 25 to 34 years (61.6%), and more than 34 years (21.2%). The median neighborhood household income was $70 677 (interquartile range, $51 645-$92 917).

From 2009 through 2016, the adjusted prevalence of prenatal marijuana use based on self-report or toxicology increased from 4.2% (95% CI, 4.0%-4.5%) to 7.1% (95% CI, 6.7%-7.5%) and was higher based on toxicology than self-report each year (Figure 1). Linear trend tests found use increased at an annual rate of 0.175 for self-report or toxicology (95% CI, 1.064-1.085; P < .001), 1.083 for toxicology (95% CI, 1.072-1.094; P < .001), and 1.062 for self-report (95% CI, 1.048-1.075; P < .001).

The adjusted prevalence based on self-report or toxicology increased significantly from 2009 to 2016 for each age group (Figure 2). Use among females younger than 18 years to age 24 years increased the most, from 12.5% (95% CI, 10.3%-14.7%) to 21.8% (95% CI, 16.5%-27.2%) for those younger than 18 years and from 9.8% (95% CI, 9.0%-10.6%) to 19.0% (95% CI, 17.8%-20.2%) for those aged 18 to 24 years. Use among women aged 25 to 34 years increased from 3.4% (95% CI, 3.1%-3.7%) to 5.1% (95% CI, 4.7%-5.4%) and use among women older than 34 years increased from 2.1% (95% CI, 1.7%-2.5%) to 3.3% (95% CI, 2.9%-3.7%). Linear trend tests found prenatal use increased at an annual relative
Marijuana is detectable approxi-
mately 30 days after last use and varies with heaviness of use and marijuana potency. It is possible, but unlikely, that some toxicology tests identify prepregnancy use.

Initial evidence suggests that prenatal marijuana may impair fetal growth and neurodevelopment, but 79% of 785 pregnant women surveyed between 2007 and 2012 reported perceiving little to no harm in prenatal use. Continued monitoring of trends, exposure timing, and offspring outcomes is important as marijuana potency rises in an increasingly permissive legal landscape.

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Discrimination | From 2009 to 2016, marijuana use among KPNC pregnant females increased from 4% to 7%. Of concern, 22% of pregnant females younger than 18 years and 19% of pregnant females aged 18 to 24 years screened positive for marijuana use in 2016. Age-specific, self-reported prevalences were similar to US data, but toxicity prevalences were higher, suggesting use has been underestimated in self-reported surveys. In California, medical marijuana was legalized in 1996, and prenatal use may further escalate in 2018 when recreational marijuana is available legally.

This study was limited to KPNC pregnant women screened for marijuana use at approximately 8 weeks' gestation. Prenatal use before vs after women realized they were pregnant could not be distinguished. Marijuana is detectable approxi-