Trends in pregnancy-associated mortality involving opioids in the United States, 2007–2016

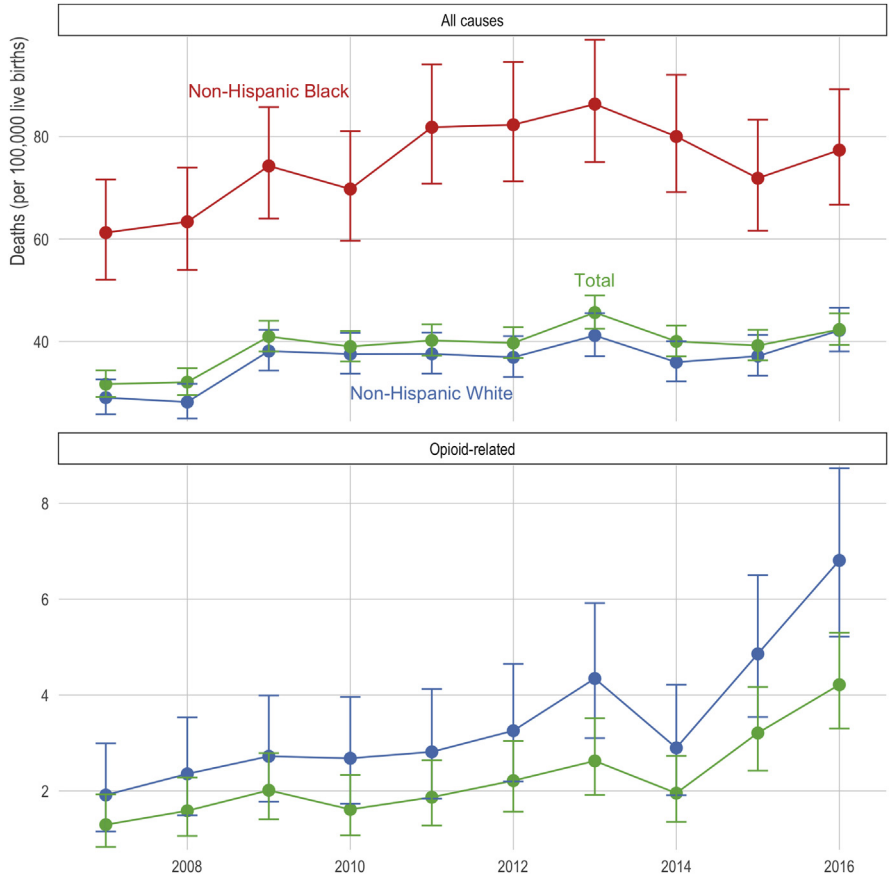
OBJECTIVE: Despite concurrent increases in opioid- and pregnancy-associated mortality in the United States, little is known about the contribution of opioids to pregnancy-associated deaths. We describe levels and trends of pregnancy-associated mortality from any cause in which the death also involved opioids.

STUDY DESIGN: We used death certificate and live birth data from the US National Vital Statistics System from 2007 to 2016. We identified pregnancy-associated deaths, defined as death from any cause while pregnant or within 1 year of pregnancy termination,[1] for women aged 15–49 years using the pregnancy checkbox on state death certificates. The checkbox indicates whether a female decedent was pregnant within the past year or at the time of death.

To account for state differences in case ascertainment,[2] we limited our analysis to the 22 states and the District of Columbia that included the checkbox as of 2007. (The states included in the analysis were Connecticut, Delaware, Florida, Idaho, Kansas, Michigan, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Texas, Utah, Washington, and Wyoming).

Pregnancy-associated deaths included *International Classification of Diseases*, 10th revision, codes A34 or O00-99, while opioid-related deaths had at least 1 opioid poisoning code

FIGURE
Trends in pregnancy-associated mortality for all causes and opioid-related causes



Point estimates (*circles*) and 95% confidence intervals (*vertical bars*) of trends in pregnancy-associated mortality for all deaths and those involving opioids for the total population (*green*) and for non-Hispanic black (*red*) and white women (*blue*), 2007–2016. (Note: data come from the National Center for Health Statistics and in accordance with their data use agreement, the trend in opioid-related mortality for non-Hispanic black women is omitted because of privacy concerns).

(T40.0–T40.4, T40.6); deaths that were both pregnancy associated and involved opioids contained a combination of these codes. We calculated pregnancy-associated mortality ratios, expressed as deaths per 100,000 live births, for all deaths and for those involving opioids; ratios were calculated separately for all residents, non-Hispanic whites, and non-Hispanic blacks.

We also calculated the distribution of pregnancy-associated deaths involving opioids by time of death and *International Classification of Diseases*–defined opioid type (eg, heroin [T40.1]; other natural/semisynthetic [T40.2]; methadone [T40.3]; and other synthetic [T40.4]). This study was classified as exempt by the Harvard School of Public Health Institutional Review Board. Materials to reproduce the analysis are available at https://github.com/MJAlexander/opioid-maternal.

RESULTS: Between 2007 and 2016, the pregnancy-associated mortality ratio increased 34% (31.7 to 42.3). Concurrently, pregnancy-associated mortality involving opioids more than doubled in terms of both the rate (1.3 to 4.2; Figure) and the percentage of all pregnancy-associated deaths (4% to 10%). These increases were most pronounced for white women despite their lower risk of all-cause, pregnancy-associated mortality compared with non-Hispanic black women (Figure).

The majority (70% in 2016) of pregnancy-associated deaths involving opioids occurred during pregnancy or within 42 days of pregnancy termination. The share of deaths involving methadone or natural/semisynthetic opioids (excluding heroin) declined substantially, and by 2016, 78% of deaths involving opioids were due to heroin or other synthetic opioids, up from 17% in 2007.

CONCLUSION: Similar to trends in opioid-related mortality in the general population,[3] we find a substantial increase in pregnancy-associated mortality involving opioids between 2007 and 2016. The patterns we observe, including rising trends among white women and increases in deaths involving heroin and other synthetic opioids, also mirror the broader opioid epidemic.[4]

Data from this study come from death certificates, which are known to include reporting errors related to both pregnancy status and use of opioids.[2,5] Despite this limitation, the findings indicate that interventions are urgently needed to reverse these concerning trends. ■

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Savings with expanding use of the levonorgestrel intrauterine device and fewer benign hysterectomies

OBJECTIVE: Due to the effectiveness of levonorgestrel (LNG)-intrauterine devices (IUDs) in managing menstrual bleeding and pelvic pain disorders, professional associations recommend their use before hysterectomy.[1] Among commercially insured women, we observed overall decreases in hysterectomy utilization of 9–17% for abnormal uterine bleeding, uterine leiomyoma, and endometriosis from 2010 through 2013.[2] We hypothesized that these decreases in hysterectomy utilization were associated with a concurrently increasing use of LNG-IUD and described financial implications of these changes.

STUDY DESIGN: This is a retrospective cohort analysis of women aged 35–54 years with commercial insurance in the Health Care Cost Institute (HCCI)—an independent, nonprofit research institute with claims data for >50 million individuals nationwide. LNG-IUD insertion was identified with an *International Classification of Diseases, Ninth Revision* (*ICD-9*) procedure code for IUD insertion and a National Drug Code specific for an IUD containing LNG (Supplementary Table). Hysterectomies for bleeding and pain disorders were identified with *ICD-9* procedure and