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DATAWATCH

Perinatal Mood And Anxiety Disorders Rose Among Privately Insured People, 2008–20

Nationwide, perinatal mood and anxiety disorder (PMAD) diagnoses among privately insured people increased by 93.3 percent from 2008 to 2020, growing faster in 2015–20 than in 2008–14. Most states and demographic subgroups experienced increases, suggesting worsening morbidity in maternal mental health nationwide. PMAD-associated suicidality and psychotherapy rates also increased nationwide from 2008 to 2020. Relative to 2008–14, psychotherapy rates continued to rise in 2015–20, whereas suicidality rates declined.

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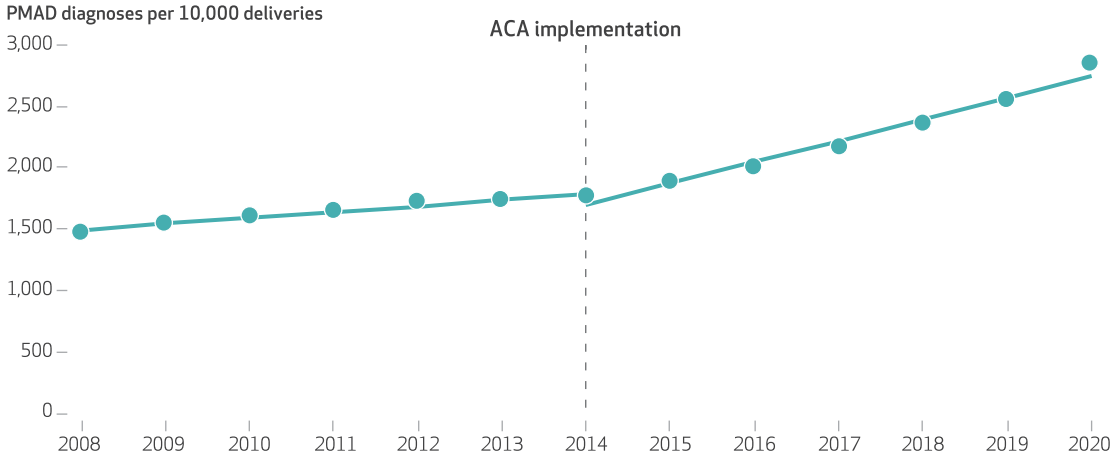
Unique among high-income countries, the US faces a growing maternal health crisis, with negative impacts on birthing people and infants.[1] Stark disparities in maternal morbidity and mortality, including mental health conditions, stem from social, structural, and policy features of US society.[2] In this study, we found that the prevalence of privately insured birthing people with diagnosed perinatal mood and anxiety disorder (PMAD) rose substantially between 2008 and 2020, with sharper increases after the 2014 implementation of the Affordable Care Act (ACA) (exhibit 1).

Although previous analyses of PMAD diagnoses focused on prevalence,[3,4] this study examined trends in diagnoses at the national and state levels, making state-to-state comparisons. This study also examined contemporaneous PMAD-associated trends in suicidality and psychotherapy receipt by state. Given that the ACA expanded mental health care coverage,[5] which potentially affected these outcomes, we examined pre-ACA (2008–14) and post-ACA (2015–20) trends sep-

EXHIBIT 1

Diagnoses of perinatal mood and anxiety disorder (PMAD) per 10,000 deliveries in the US among privately insured women, 2008–20



SOURCE Authors' analysis of Optum Clinformatics Data Mart claims data for women ages 15–44 who had a live-birth delivery during the period 2008–20 and had continuous enrollment in a single health plan for 12 months before and 12 months after delivery. **NOTE** Additional details are in the technical appendix (see note 8 in text).

Overall, access to psychotherapy may have stemmed suicidality despite increasing PMAD diagnoses.

arately. The study contributes to the literature by incorporating trends and pre-ACA and post-ACA comparisons.

We used administrative medical claims representing commercially insured people across the US from Optum's deidentified Clinformatics Data Mart Database. To construct state-specific PMAD diagnosis trajectories and determine how PMAD diagnoses changed from the pre-ACA to post-ACA periods, we examined geographic variations by state and year among women with inpatient deliveries resulting in a live birth.

Study Data And Methods

We conducted serial, cross-sectional analyses of women with live-birth deliveries during 2008–20, using deidentified claims from the Clinformatics Data Mart Database. The database covers commercially insured people across all fifty US states and Washington, D.C. Our cohort included women ages 15–44 with continuous enrollment in a single health plan for twelve months both before and after delivery.

To code deliveries, we employed International Classification of Diseases, Clinical Modification (ICD-9/10-CM), diagnoses and procedures, diagnosis-related groups, and Current Procedural Terminology codes. To identify PMAD diagnoses during the twenty-four months surrounding delivery, we used the Healthcare Cost and Utilization Project algorithm[6,7] (online appendix exhibit A).[8]

We calculated PMAD diagnoses per 10,000 deliveries by state and year from 2008 to 2020, suicidality prevalence (that is, suicidal ideation or self-harm diagnoses), and any psychotherapy use overall and among people with PMAD diagnoses. We calculated PMAD diagnoses by age (15–24, 25–39, and 40–44), race and ethnicity (Asian, Black, Hispanic, White, and other race), and geographic region (Midwest, Northeast, South, and West).

We used linear regressions to examine the potential ACA impact on outcomes across states after its 2014 implementation.[9] We included 2014 in the pre-ACA period as a transition year to help ensure that we did not underestimate the potential ACA impact. We generated range plots, grouping pre-ACA and post-ACA years. We used state-specific linear regressions to identify annual outcome changes per 10,000 deliveries with choropleth maps shaded to visualize values over geographical areas.

In our by-year and by-state analyses, we included states that had ten or more cases per year for PMAD and psychotherapy (within PMAD) outcomes. For suicide-related diagnoses outcomes (within PMAD), we included states with one or more cases per year because of the rare occurrence of suicidality.

Our analysis had limitations. We suppressed findings from states with few outcomes. Our study period captured the beginning of the COVID-19 pandemic, a period when the pandemic potentially had its largest impacts on health care use from stringent lockdown policies; PMAD diagnoses, sequelae, and treatment could have varied since then. Our sample included people continuously enrolled in private insurance for twenty-four months, representing a population not generalizable to those publicly insured or experiencing gaps in coverage. Since disproportionate maternal morbidity and mortality burden likely occurs among publicly insured or uninsured people, future studies should include them. The twenty-four-month study period included at least three months before pregnancy, and thus some mood and anxiety diagnosis codes might not reflect PMAD. Analyses excluded non–live births, yet people undergoing pregnancy loss could experience PMAD. All of these factors could have limited the generalizability and applicability of our findings.

Study Results

In a national cohort of 750,004 commercially insured women with a live birth between 2008 and 2020, 144,037 had a PMAD diagnosis (19.2 percent; data not shown). The total number of perinatal women decreased from a high of 64,842 in 2008 to a low of 52,479 in 2020, a 19.1 percent decrease (data not shown). Concurrently, women with diagnosed PMAD increased from 9,520 in 2008 to 14,890 in 2020, a 56.4 percent increase (data not shown). PMAD prevalence surged from 1,468 per 10,000 deliveries in 2008 to 2,837 per 10,000 deliveries in 2020, for a 93.3 percent increase (exhibit 1). Appendix exhibit B shows increased PMAD diagnoses by state and year; however, the magnitude of

change varied across states.[8]

Perinatal people in all age, race and ethnicity, and geographic categories experienced growth in PMAD diagnoses from the pre-ACA era to the post-ACA era (exhibit 2). Among races and ethnicities, Black people saw the largest increase (55.0 percent, from 1,404 to 2,176 per 10,000 deliveries). The initial prevalence of PMAD diagnoses was highest among the oldest people (ages 40–44), yet the youngest people (ages 15–24) experienced the largest increase in diagnoses (49.6 percent, from 1,913 to 2,861 per 10,000 deliveries).

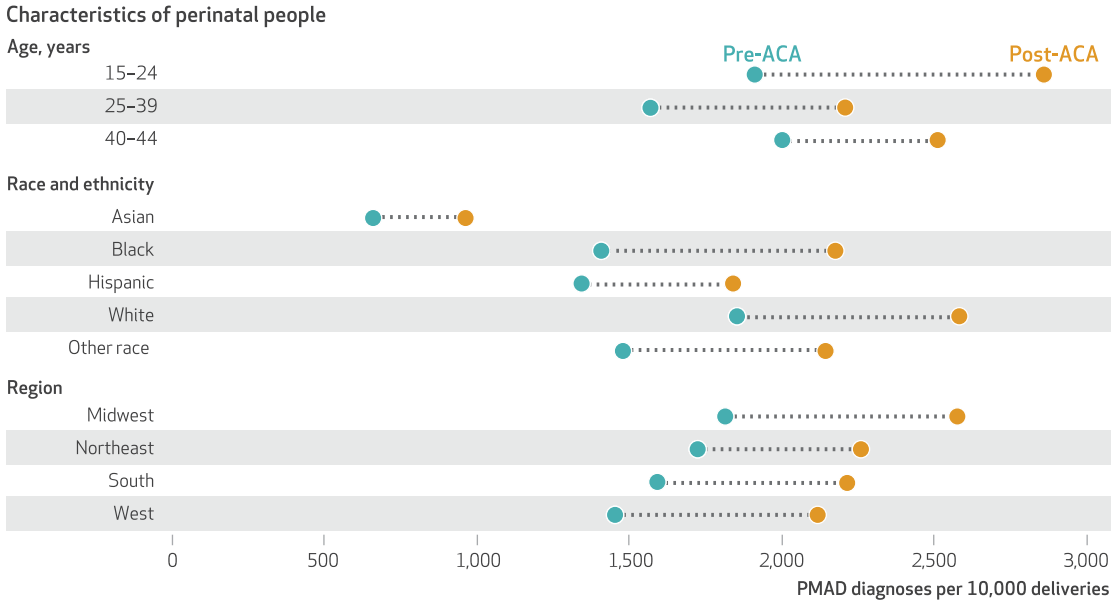
Exhibit 3 shows that all states except Vermont experienced increasing rates of PMAD diagnoses post-ACA relative to pre-ACA. Vermont had PMAD diagnoses of 3,614 per 10,000 deliveries pre-ACA, which dropped to 2,292 per 10,000 deliveries post-ACA. Rhode Island and Maine had the highest rates of PMAD diagnoses both pre-ACA (2,720 and 2,708 per 10,000 deliveries, respectively) and post-ACA (3,559 and 3,683 per 10,000 deliveries, respectively). California had the lowest PMAD diagnosis rate pre-ACA, at 1,131 per 10,000 deliveries, which increased to 1,716 per 10,000 deliveries post-ACA. Delaware had the second-lowest PMAD diagnosis rate pre-ACA, at 1,324 per 10,000 deliveries, and the largest increase in diagnoses, reaching 2,968 per 10,000 deliveries (a 124 percent increase). The magnitude and direction of change in PMAD diagnoses pre-ACA to post-ACA varied within age and race and ethnicity categories across states (appendix exhibit C).[8]

Exhibit 4 shows the annual rate of change in PMAD diagnoses per 10,000 deliveries during 2008–20, by state. All nonsuppressed states indicated positive change. Mean annual change across all states reached 109 additional PMAD diagnoses per 10,000 deliveries. Iowa exhibited the greatest annual growth, accruing an average increase of 163 PMAD diagnoses per 10,000 deliveries annually. New Mexico reflected the smallest annual growth, at 49 per 10,000 deliveries. In regional stratification (data not shown), the Midwest had the highest average annual change in PMAD diagnoses per 10,000 deliveries, with 121 per 10,000, followed by the South (107), Northeast (104), and West (97).

Exhibit 5 shows that suicidality among perinatal people with PMAD diagnoses increased pre-ACA but decreased post-ACA. Although PMAD diagnoses and suicidality in the overall perinatal population rose during both periods, PMAD diagnoses accelerated post-ACA and grew far more rapidly than suicidality among those with PMAD diagnoses. Suicidality among those with PMAD diagnoses rose from 175 per 10,000 deliveries in

EXHIBIT 2

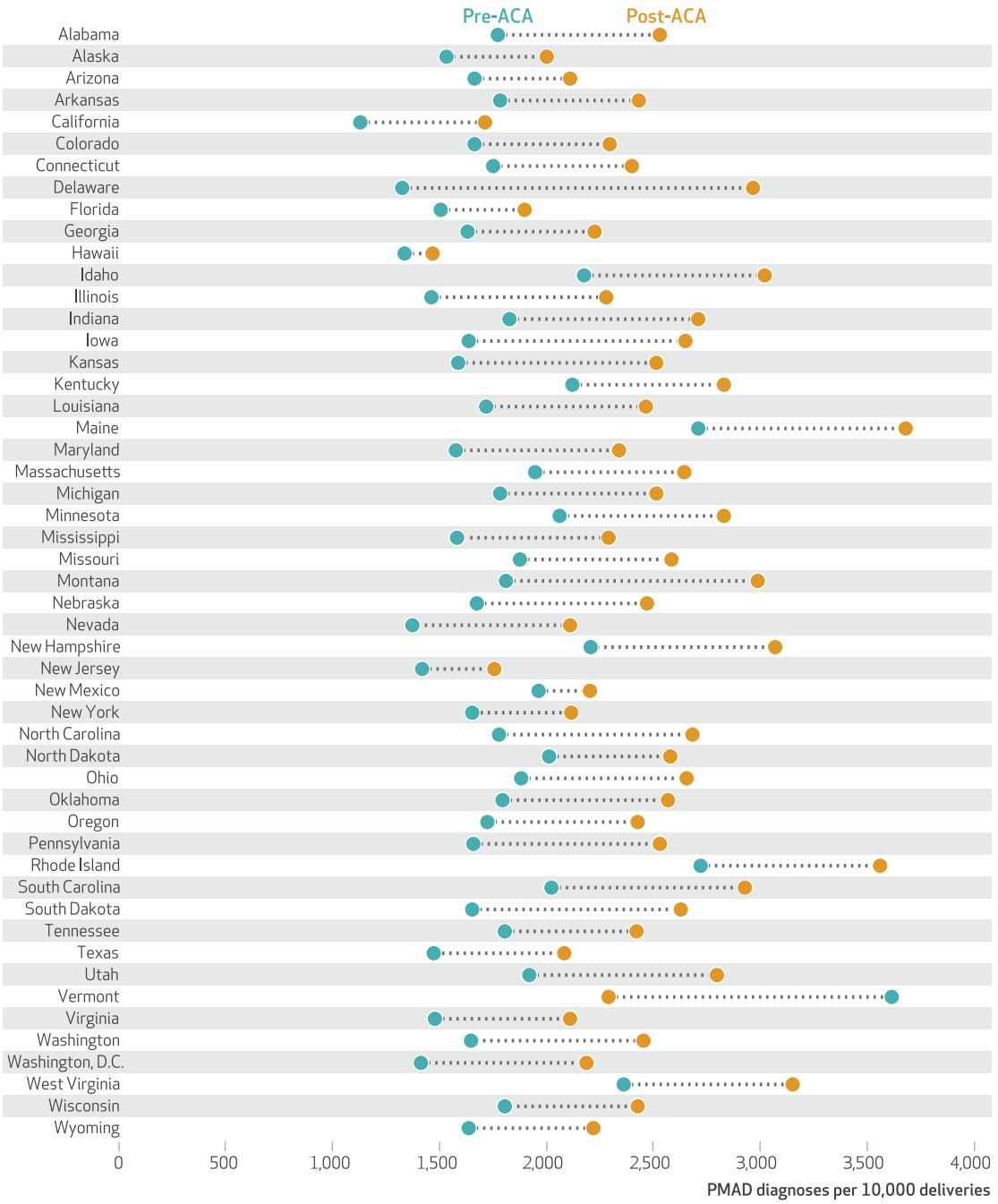
Total diagnoses of perinatal mood and anxiety disorder (PMAD) per 10,000 deliveries in the US among privately insured women, pre-Affordable Care Act (ACA) and post-ACA, by age, race and ethnicity, and geographic region, 2008–20



SOURCE Authors' analysis of Optum Clinformatics Data Mart claims data for women ages 15–44 who had a live-birth delivery during the period 2008–20 and had continuous enrollment in a single health plan for 12 months before and 12 months after delivery. **NOTE** Unadjusted PMAD cases per 10,000 live-birth deliveries are presented as the differences between the pre-ACA period (2008–14) and the post-ACA period (2015–20).

EXHIBIT 3

Total diagnoses of perinatal mood and anxiety disorder (PMAD) per 10,000 deliveries in the US among privately insured women, pre-Affordable Care Act (ACA) and post-ACA, by state, 2008–20



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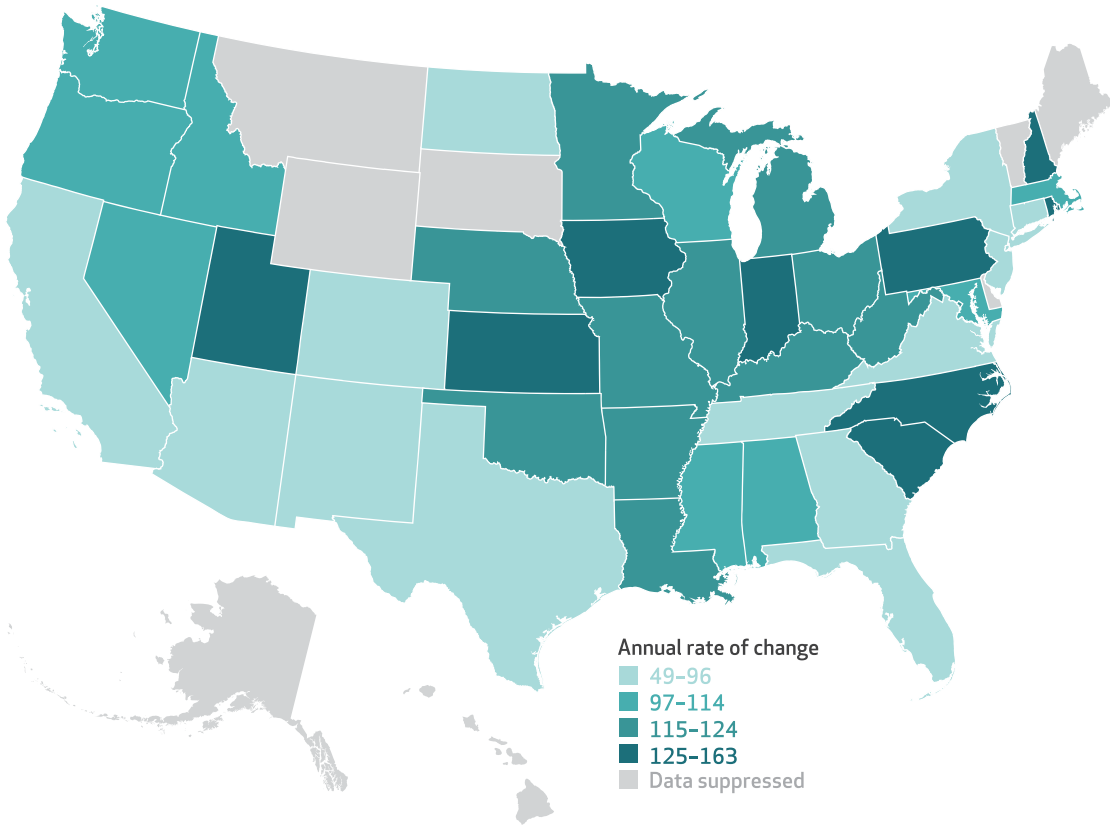
2008 to 213 per 10,000 deliveries in 2020 (21.7 percent increase), whereas the overall suicidality rate among perinatal people rose from 28 per 10,000 deliveries in 2008 to 63 per 10,000 deliveries in 2020 (a 125 percent increase) (appendix exhibit D).[8] We observed considerable differences in annual changes in suicidality rates among women diagnosed with PMAD per 10,000 deliveries across states. Louisiana's annual rate of increase was greatest, at 22 per 10,000 deliv-

EXHIBIT 4

Annual rate of change in the number of diagnosed perinatal mood and anxiety disorders (PMAD) per 10,000 deliveries in the US among privately insured women, 2008–20



SOURCE Authors' analysis of Optum Clinformatics Data Mart claims data for women ages 15–44 who had a live-birth delivery during the period 2008–20 and had continuous enrollment in a single health plan for 12 months before and 12 months after delivery. **NOTES** Changes reflect unadjusted year-to-year differences during the period 2008–20. States with fewer than 10 diagnosed PMAD cases per year are suppressed (designated "Data suppressed"). Additional details are in the technical appendix (see note 8 in text).

eries. Maryland experienced the greatest negative annual rate of change, at –15 per 10,000 deliveries (appendix exhibit E).[8]

Exhibit 6 shows increasing psychotherapy use among perinatal people with PMAD diagnoses during 2015–20, after nonsignificant declines during 2008–14. The use of psychotherapy among those with PMAD diagnoses rose from 4,741 per 10,000 deliveries in 2008 to 5,535 per 10,000 deliveries in 2020, for a 16.7 percent increase. Psychotherapy use among all perinatal people increased from 1,103 per 10,000 deliveries in 2008 to 2,750 per 10,000 deliveries in 2020, for a 149.3 percent increase (appendix exhibit F).[8] Oregon had the most pronounced annual increase, at 223 per 10,000 deliveries. Wisconsin exhibited the lowest annual change, at –46 per 10,000 deliveries. The mean annual change for all states reached 59 per 10,000 deliveries (appendix exhibit G).[8]

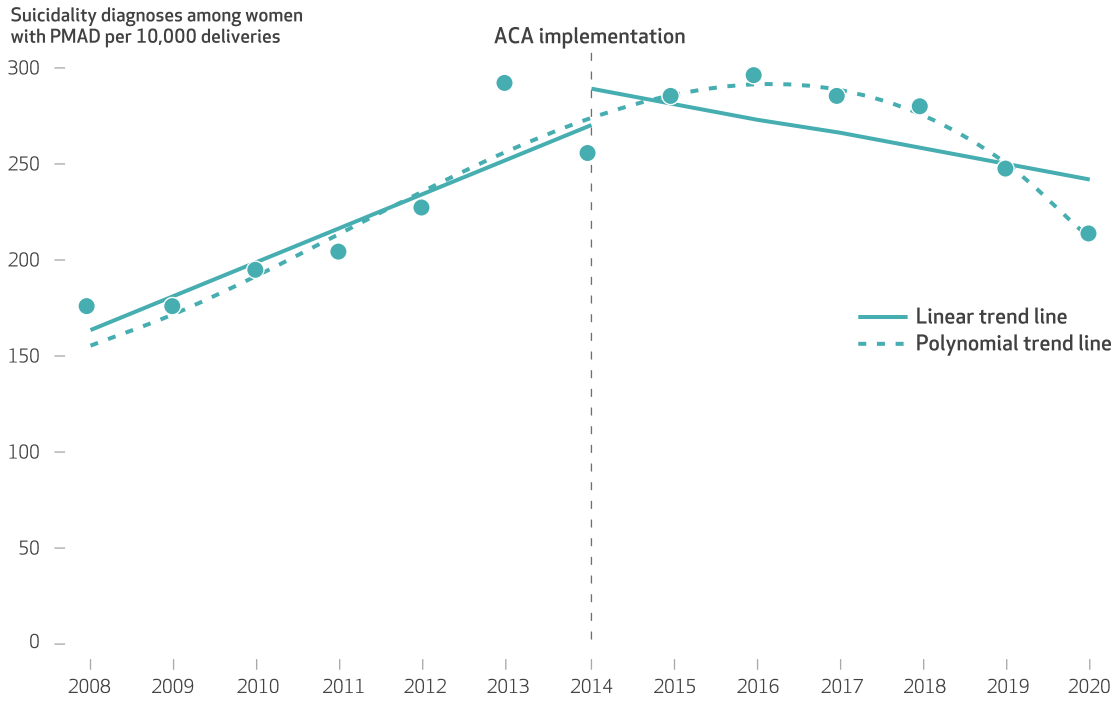
Discussion

PMAD diagnoses represented a large, growing contributor to US maternal morbidity and mortality during 2008–20, with substantial increases across states, ages, and races and ethnicities. Upward trends aligned with maternal health improvement efforts. The ACA required insurance plans to cover maternity and preventive services, which likely increased PMAD screening and detection. The ACA also likely captured a vulnerable population with its coverage, increasing the likelihood of PMAD diagnosis among people at elevated risk. Simultaneously, the Bringing Postpartum Depression Out of the Shadows Act of 2017 and subsequent Biden-Harris administration initiatives to address maternal behavioral health provided needed financial resources to mental health services for perinatal people.[10]

These initiatives operated alongside Maternal Mortality Review Committees, which found that one in nine pregnancy-related deaths during

EXHIBIT 5

Diagnoses of suicidality among privately insured women diagnosed with perinatal mood and anxiety disorders (PMAD) per 10,000 deliveries in the US, 2008–20



SOURCE Authors' analysis of Optum Clinformatics Data Mart claims data for women ages 15–44 who had a live-birth delivery during the period 2008–20 and had continuous enrollment in a single health plan for 12 months before and 12 months after delivery. **NOTES** Unadjusted prevalence of suicidality is presented as two trend lines superimposed to smooth out the year-to-year fluctuation in the data and illustrate the differences between the pre–Affordable Care Act (ACA) period (2008–14) and the post-ACA period (2015–20). Additional details are in the technical appendix (see note 8 in text).

2008–17 had mental health conditions as the underlying cause, with 100 percent of mental health–related deaths deemed preventable.[11] Documentation of maternal morbidity and mortality burden and committee recommendations may have improved screening, diagnosis practices, and prevention.

Observed changes in PMAD diagnoses may reflect additional phenomena co-occurring with the ACA, including greater illness awareness,[12] diagnostic coding changes (that is, the 2015 transition from ICD-9 to ICD-10),[13] decreased mental illness stigma,[14] sicker populations,[3] and improved care coverage.[5]

Overall, access to psychotherapy may have stemmed suicidality despite increasing PMAD diagnoses. But although more PMAD diagnoses may have led to increased psychotherapy, therapy access depends on provider availability, which varies by geographic region and insurance coverage network.

Moving forward, strategies focused on subpopulations may help reverse increasing PMAD diagnoses through focusing on younger and Black perinatal people.[2] Intersectionality among age, race and ethnicity, and location may exacerbate mental health needs among subpopulations.[3,15,16]

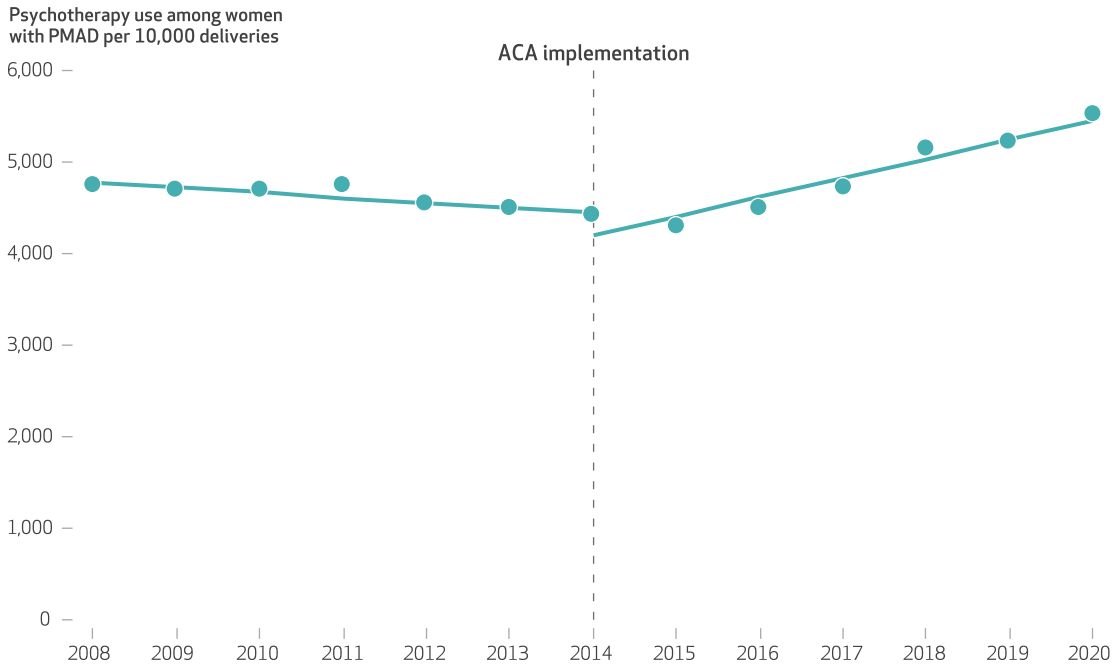
Accurate tracking will remain critical because it may prove difficult to differentiate increased PMAD diagnoses from improved detection versus increased burden. Tracking could address maternal morbidity and mortality undercounting that results from excluding psychiatric causes of death and limiting the postdelivery period. The Centers for Disease Control and Prevention uses the World Health Organization definition of *maternal death* as "death of a woman while pregnant or within forty-two days of termination of pregnancy," but the definition excludes accidental or incidental causes (including suicide).[17] Yet people with PMAD experience a sustained risk for maternal morbidity and mortality one year postdelivery.[18]

Conclusion

Observed trends in PMAD diagnoses among privately insured people during 2008–20 and in associated suicidality and psychotherapy use

EXHIBIT 6

Use of psychotherapy among privately insured women diagnosed with perinatal mood and anxiety disorders (PMAD) per 10,000 deliveries in the US, 2008–20



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suggest an increasingly rapid worsening of US maternal mental health morbidity. To better inform policy that addresses this crisis, and as public health and policy shift postpandemic, future studies could assess post-2020 trends among commercially insured, publicly insured, and uninsured people. ■

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NOTES

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