

## Health Issue Brief

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# Untreated Maternal Mental Health Conditions in Texas: Costs to Society and to Medicaid

Maternal mental health conditions (MMHCs), which include depression and anxiety disorders during pregnancy and through five years post-delivery, are common among mothers in Texas and across the United States. These conditions can have a devastating impact on maternal-child bonding, breastfeeding initiation, maternal health and productivity, and child development and health later in life. Despite their impacts, these medical conditions often go undiagnosed and untreated.<sup>1,2</sup> Recognizing a need for attention in this area, the Texas legislature directed the Texas Health and Human Services Commission (HHSC) to release a strategic plan to address postpartum depression in September 2020.<sup>3</sup> To further inform this and other efforts to address MMHCs in Texas, this issue brief describes the findings from a new mathematical model that quantifies the monetary costs of untreated MMHCs to society<sup>4</sup> and to Medicaid.<sup>5</sup> **The estimated total monetary cost of untreated MMHCs from conception through five years postpartum in Texas is \$2.2 billion, but this monetary cost does not fully capture the human costs of MMHCs.**

### Context

MMHCs are common in the United States, affecting 13.2% of women from pregnancy through five years post-delivery and are among the most common obstetric complications in Texas (Figure 1).<sup>6</sup>

These conditions often go undiagnosed and untreated, despite the existence of screening tools and effective treatments.<sup>7</sup> In fact, only half of perinatal women who are diagnosed with depression receive any treatment.<sup>2</sup>

In Texas, Medicaid for Pregnant Women covers an estimated 47.5% of births.<sup>8</sup> When coverage through this program ends after 60 days post-delivery,<sup>9</sup> many women with low income who do not meet the income requirements for Medicaid or for subsidies through the Affordable Care Act Marketplace become uninsured and unable to access screening and treatment because of the cost.

When left untreated, MMHCs can become a multigenerational issue, negatively affecting the mother and child’s long-term physical, emotional, and developmental health.

### Figure 1. Key takeaways

#### MMHCs are among the most common complications of pregnancy and childbirth.



In Texas, MMHCs affect more than **1 in 8** pregnant and postpartum women. At least **49,816** of the **377,397** Texas mothers who gave birth in 2019 had an MMHC.

#### Untreated MMHCs are costly and have multigenerational consequences.



MMHCs account for an estimated **\$2.2 billion** in societal costs for all births in 2019, from conception through five years post-delivery.

#### Nationally, half of perinatal women with a diagnosis of depression do not get the treatment they need.



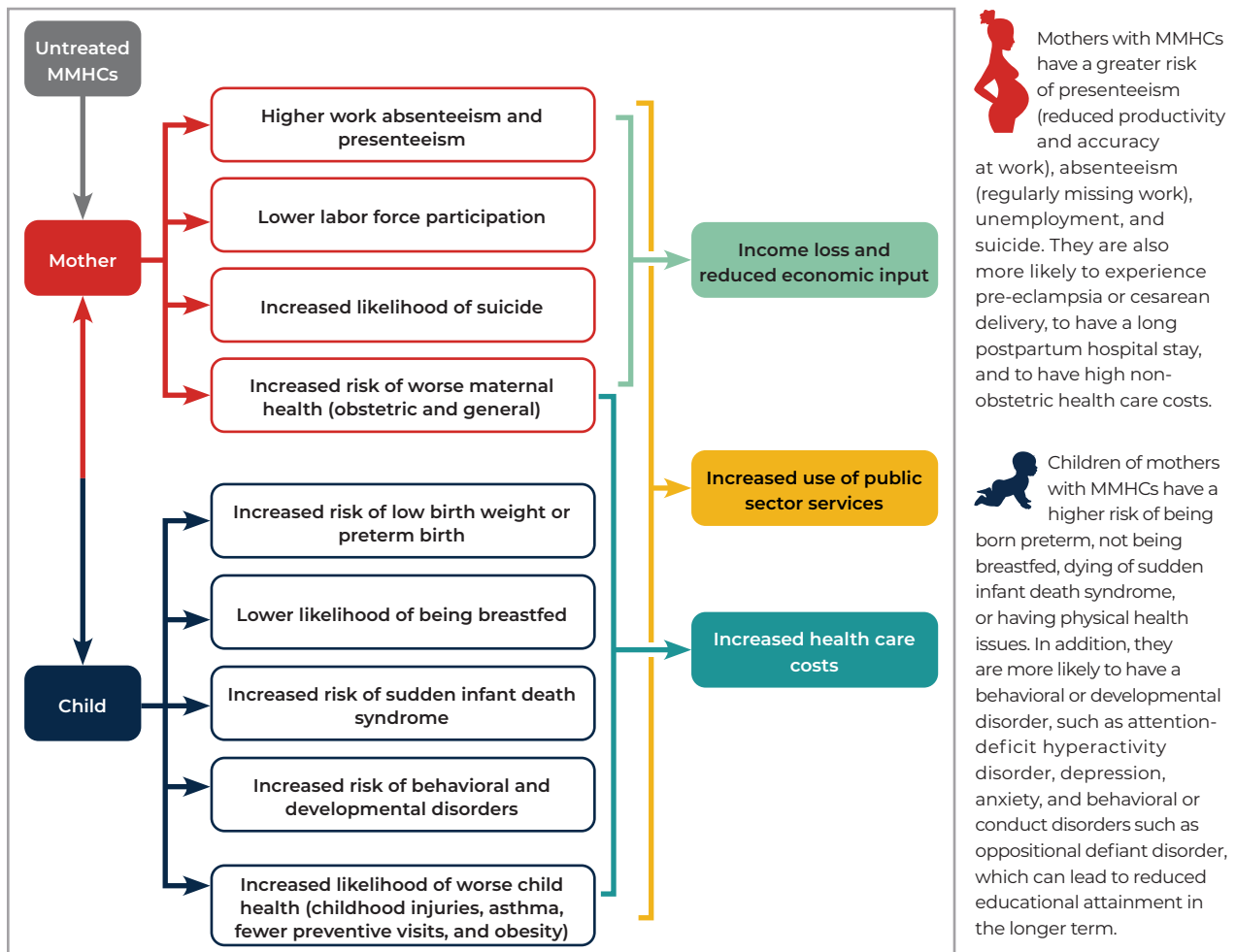
## Conceptual model and research rationale

To our knowledge, this mathematical model, an adaptation of our national model,<sup>10</sup> presents the most comprehensive analysis to date of the economic burden of MMHCs in Texas. To construct the model, we compiled the most recent peer-reviewed literature and secondary data sources to quantify the societal costs of not treating MMHCs. We collected data on the prevalence of MMHCs, the outcomes associated with untreated MMHCs, and the costs and baseline rates of each outcome. With this information, we created cost estimates for all Texas births in 2019 when following the mother–child pair from pregnancy through five years post-delivery.

Untreated MMHCs are linked to an increased likelihood of absenteeism, presenteeism, and unemployment.<sup>11</sup> Mothers with MMHCs also have an increased risk of suicide,<sup>12</sup> pre-eclampsia,<sup>13</sup> delivery via cesarean section,<sup>14</sup> and longer peripartum hospital stays.<sup>14</sup> Children born to mothers with MMHCs have an increased risk of preterm birth<sup>15</sup> and child behavioral and developmental disorders.<sup>16</sup>

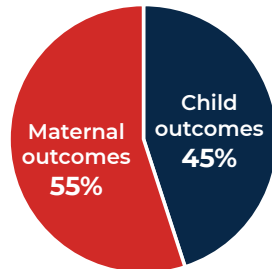
Figure 2 presents our conceptual framework of how untreated MMHCs influence maternal, child, and societal outcomes. As the framework shows, our model reflects the societal costs of untreated MMHCs through three primary domains: (1) maternal productivity loss; (2) greater use of public sector services, including Supplemental Nutrition Assistance Program and Medicaid; and (3) higher health care costs for mother and child.

**Figure 2. Conceptual model of how untreated MMHCs influence maternal, child, and societal outcomes**



## Key findings

**Figure 3. 2019 Societal cost of MMHCs**



**Average cost per mother-child pair:**

**\$24,796** from conception to age 1

- » \$13,158 from maternal outcomes
- » \$11,817 from child outcomes

**\$44,460** from conception to age 5

- » \$24,346 from maternal outcomes
- » \$20,114 from child outcomes

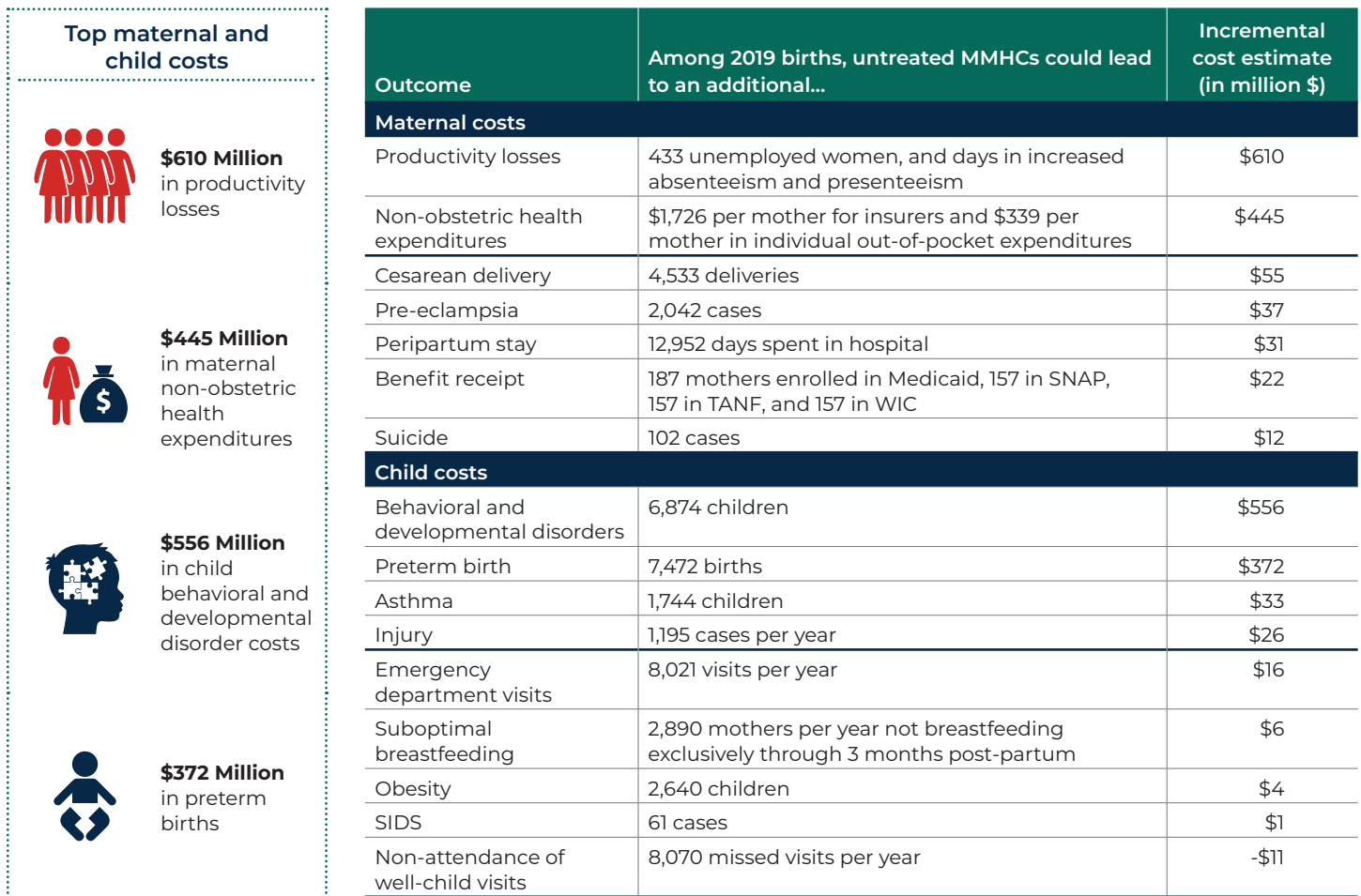
**All women.** We estimated that the prevalence of untreated MMHCs among all Texas women is 13.2%, not accounting for the increased prevalence of MMHCs arising from the COVID-19 pandemic. Using this prevalence estimate, we estimated that the total societal cost of MMHCs in Texas for all births in 2019 is \$2.2 billion (Figure 1). This amounts to more than \$44,000 in societal costs per mother with an MMHC and her child from conception to age 5, which is higher than the national average of \$32,000. About 55% of the societal costs can be attributed to maternal outcomes, with the largest costs coming from productivity losses (\$610 million), non-obstetric health expenditures (\$445 million),<sup>17</sup> and obstetric-specific health expenditures (Figures 3 and 4).<sup>18</sup> 45% of costs are related to child outcomes, with the largest costs coming from child behavioral and developmental disorders (\$556 million), preterm births (\$372 million), and asthma (\$33 million) (Figures 3 and 4). Reduced attendance at well-child care visits could partially offset the cost of child outcomes in the short term (-\$11.2 million) but, in the long term, might lead to an increase in health care costs through worse child health.

Nearly half of the societal costs occur between pregnancy and the child’s first birthday and are associated with pregnancy, birth complications such as preterm birth, and other obstetric health expenditures.

**Medicaid.** We estimated that the prevalence of untreated MMHCs among mothers enrolled in Texas’ Medicaid for Pregnant Women program is 17.2%. We also estimated that the total cost of untreated MMHCs in Texas for all Medicaid for Pregnant Women-covered births in 2019, excluding costs for productivity losses, maternal suicide, and sudden infant death syndrome, is \$962 million. This amounts to more than \$31,000 in health care system costs per mother enrolled in Medicaid for Pregnant Women and her child from conception to five years after birth. Within the Medicaid population, 35% of costs are related to maternal outcomes, with the largest costs coming from non-obstetric health expenditures (\$276 million). When Medicaid for Pregnant Women ends after 60 days post-delivery, the health care system (for women who cannot afford to self-pay or purchase health insurance) or private insurers (for women who are able to purchase insurance in the Affordable Care Act Marketplace) bear the costs of maternal outcomes.

A total of 65% of costs relate to child outcomes, with the largest costs coming from child behavioral and developmental disorders (\$345 million) and preterm birth (\$231 million). The health care system (for children whose parents no longer meet Medicaid or Children’s Health Insurance Program income eligibility requirements) or Medicaid (for children whose parents meet the income eligibility requirements) bear the costs of these child outcomes. Overall, 48% of the total health system costs, beyond Medicaid, for mothers enrolled in Medicaid for Pregnant Women and their children are associated with pregnancy and birth complications and occur between conception and the child’s first birthday.

**Figure 4. Estimates of societal costs of MMHCs and impacts for 2019 births in Texas, from child's conception to fifth birthday**



### Health disparities by race and ethnicity in Texas

Accounting for differences in the prevalence of MMHCs, population size, and societal and health outcomes revealed that untreated MMHCs occur most often among Non-Hispanic Black mothers (18.2%), followed by Hispanic mothers (12%) and Non-Hispanic White mothers (11.4%). Non-Hispanic Black mothers are more likely than their Hispanic or Non-Hispanic White mothers to experience pre-eclampsia, cesarean delivery, or preterm birth but have lower obstetric health care expenditures, suggesting Non-Hispanic Black mothers' having less access to high-quality care.

Health disparities result in higher societal costs per Non-Hispanic Black mother-child pair (\$62,000) than for Non-Hispanic White and Hispanic mother-child pairs (\$43,000). Identifying and closing the gap in these health disparities could lead to lower societal costs for all.

**Non-Hispanic White mothers.** Untreated MMHCs affect an estimated 11.4% of Non-Hispanic White mothers, and the cost for births in 2019 is \$599 million. This amounts to more than \$43,000 in costs per Non-Hispanic White mother and her child over a six-year period. A total of 56% of costs for Non-Hispanic White mother-child pairs relate to maternal outcomes, and 44% relate to child outcomes.

The largest maternal costs come from productivity losses (\$170 million) and non-obstetric health expenditures (\$123 million), and the largest child costs come from child behavioral and developmental disorders (\$155 million) and preterm birth (\$89 million).

**Non-Hispanic Black mothers.** Untreated MMHCs affect an estimated 18.2% of Non-Hispanic Black mothers, and the cost for births in 2019 is \$521 million. This amounts to nearly \$62,000 in costs per Non-Hispanic Black woman and her child over the period between conception and age 5. A total of 65% of costs for Non-Hispanic Black mother–child pairs relate to maternal outcomes, and 35% relate to child outcomes. The largest maternal costs come from productivity losses (\$189 million) and non-obstetric health expenditures (\$118 million), and the largest child costs come from child behavioral and developmental disorders (\$94 million) and preterm birth (\$74 million).

**Hispanic mothers.** Untreated MMHCs affect an estimated 12% of Hispanic mothers, and the cost for births in 2019 is \$928 million. This amounts to more than \$43,000 per Hispanic mother and her child over the period between conception and age 5. A total of 55% of costs for Hispanic mother–child pairs relate to maternal outcomes, and 45% relate to child outcomes. The largest maternal costs come from productivity losses (\$229 million) and non-obstetric health expenditures (\$211 million), and the largest child costs come from child behavioral and developmental disorders (\$239 million) and preterm birth (\$149 million).

## Comparable conditions

MMHCs remain among the most costly conditions during pregnancy and through five years post-delivery. Examining only medical costs (excluding labor force and non-medical social services costs), MMHCs cost \$20,342 per mother–child pair over the period between conception and age 5. In comparison, other perinatal conditions, such as post-delivery hemorrhage and gestational diabetes, each cost up to \$3,300 per mother.<sup>19,20</sup>

## Conclusion

Our model demonstrates that the total societal cost of not treating MMHCs is substantial (\$2.2 billion overall and \$962 million to Medicaid). It also shows that employers, through reduced maternal productivity, and health insurers, through increased health care costs for mother and child, bear most of these costs. In addition, our model shows substantial variation in the prevalence of MMHCs and the resulting costs for women of different racial and ethnic backgrounds. One explanation for this variation could involve poorer access to screening and high quality care among groups experiencing systemic racism and other socioeconomic disadvantages. Providing better screening and earlier intervention for groups disproportionately impacted by MMHCs could lead to better long-term outcomes and cost savings to society.<sup>21,22</sup>

The Texas Health and Human Services Commission's efforts to increase awareness of MMHCs among providers and the public, establish referral networks, and increase access to care represent an important step toward improving the health of mothers and their children. In addition, these efforts will help increase women's productivity, reduce the utilization of high-cost obstetric and non-obstetric care, and decrease women's use of social services. Lengthening coverage to those uninsured or underinsured in the post-delivery period through the child's first five years of life could benefit the Texas Health and Human Services Commission, employers, private health insurers, and the health care system more generally. Public and private sector stakeholder collaboration to ensure and expand access to equitable and consistent screening and high quality treatment for pregnant and post-delivery women regardless of race, income, or other socioeconomic factors will not only lead to potential immediate cost savings, but assist in bolstering health of generations to come.

## Endnotes

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- <sup>4</sup> Societal costs include direct costs, such as medical costs, and indirect costs, such as lost work time.
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### Background on work and contact information

Mathematica is a nonpartisan company dedicated to building evidence to improve public health and well-being that developed the cost model and this issue brief with support from St. David's Foundation. The views expressed in this brief belong solely to the authors at the time of dissemination and do not reflect the official policy or position of Mathematica, St. David's Foundation, or any other agency or organization. For more information on this work and approach, contact Kara Zivin at [KZivin@mathematica-mpr.com](mailto:KZivin@mathematica-mpr.com).

Committed to advancing health equity across Central Texas, St. David's Foundation seeks to ensure women and girls are supported with the resources, respect and conditions vital for equitable health and well-being. For more information about the Foundation and its commitment to investing in women's health and access to services, contact Lourdes Rodriguez, DrPH, Senior Program Officer at [LRodriguez@stdaidsfoundation.org](mailto:LRodriguez@stdaidsfoundation.org).

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### Additional information on modeling methods, advisory group, and limitations

#### Model methods

Our model focused on Texas-specific maternal and child outcomes linked to MMHCs in the literature and recognized by subject matter experts. We initially identified 2,347 articles in our literature review and analyzed 75 articles that passed title and abstract screening. After our review, which included a rigorous selection criteria that controlled for confounding factors, we selected 29 new articles to add to the 82 articles we used in our prior study, for a total of 111 articles.

We used a cost-of-illness methodology to synthesize existing evidence and used literature and secondary data sources to inform the model's inputs. We generated three input types for the model: (1) impact estimates, which measure the incremental effects associated with exposure to untreated MMHCs (versus no exposure to untreated MMHCs); (2) the prevalence of MMHCs in Texas; and (3) the associated costs and baseline rates of each outcome affected by exposure to untreated MMHCs, such as preterm birth.

We applied the impact estimates to the baseline rate of each outcome. We then added the impact estimate—which measures the expected change in outcome because of exposure to MMHCs standardized to a percentage point change—to the rate of the outcome among the general population so we could calculate the expected rate of the outcome among mothers with an MMHC. For example, the preterm birth impact estimate would measure the incremental risk of a preterm birth to a pregnant mother with an untreated MMHC relative to a mother without an MMHC. Adding this estimate to the baseline rate of preterm birth among the general population would yield an approximate likelihood of preterm birth for mothers with an untreated MMHC.

To calculate the aggregate excess costs of MMHCs because of an outcome in a year, we multiplied the individual incremental risk of the outcome with the expected number of mothers with MMHCs. We then multiplied the product by the incremental unit cost. We made additional assumptions based on the literature on the rate of recovery from untreated MMHCs to extrapolate the costs to the six-year period. We then calculated the economic burden of untreated MMHCs by adding the costs across all outcomes and years. In addition to an overall Texas model, we analyzed subgroups by race and ethnicity and Texas Medicaid enrollment status. The race and ethnicity model includes Texas-specific demographic information, prevalence estimates, and cost estimates when available per category (Non-Hispanic White, Non-Hispanic Black, Hispanic). The Medicaid model excludes the cost of productivity loss, suicide, and sudden infant death syndrome in calculating the economic burden of untreated MMHCs, as Medicaid does not bear these costs.

#### Main model outcomes

**Maternal outcomes.** We estimated that maternal outcomes contribute \$1.2 billion to total societal costs from pregnancy to five years postpartum. Productivity losses contribute \$610 million through five years post-delivery. Increased non-obstetric health expenditures contribute \$445 million through five years post-delivery. Increased incidence of delivery by cesarean section contributes \$55 million, increased incidence of pre-eclampsia contributes \$37 million, and increased incidence of long delivery-related inpatient stays contributes \$31 million from pregnancy through the child's first birthday. Increased reliance on benefit programs contributes \$22 million through five years post-delivery. Finally, increased incidence of suicide contributes \$12 million to total societal costs through five years post-delivery.

**Child outcomes.** We estimated that child outcomes contribute \$1.0 billion to total societal costs from the mother's pregnancy through five years post-delivery. Increased prevalence of child behavioral developmental disorders contributes \$556 million through five years post-delivery. Increased incidence of preterm birth contributes \$372 million in the year including pregnancy. Increased prevalence of childhood asthma contributes \$33 million, increased incidence of child injury contributes \$26 million, and increased incidence of child emergency department visits contributes \$16 million through five years post-delivery. Increased incidence of suboptimal breastfeeding contributes \$6 million through the first year post-delivery. Increased prevalence of childhood obesity contributes \$4 million through five years post-delivery. Increased incidence of sudden infant death syndrome contributes \$1 million through the first year post-delivery. Finally, reduced attendance at well-child visits through five years post-delivery contributes to a \$11 million reduction in costs in the short term but can lead to a longer-term increase in costs because of worse child health.

### Additional information on modeling methods, advisory group, and limitations

**Model limitations**

**Restricted time frame.** We designed this model to focus on a six-year period (pregnancy through five years post-delivery) so that stakeholders could understand the immediate impacts of untreated MMHCs. We recognize, however, that MMHCs can have long-term effects on the mother and the child, indicating that our estimates might represent only a fraction of the lifetime costs.

**Cost of treating MMHCs.** This model does not explore the economic case for intervention or the cost of treating MMHCs. Therefore, the model does not incorporate various treatment options, nor does it differentiate between inadequate treatment and no treatment for MMHCs.

**No primary data analyses.** The model uses only inputs from publicly available secondary data and existing peer-reviewed literature. We did not analyze any primary data for the model.

**Nonmaternal caregivers.** Although we recognize that nonmaternal caregivers can also have mood and anxiety disorders, such as parental depression, we only modeled the burden of maternal MMHCs on society and Medicaid. We also know that others in the household, such as fathers or other caregivers, can be affected by maternal MMHCs, but we focused only on the mother-child pair in the model.

**Race and ethnicity subgroup analysis.** Although MMHCs can have differential impacts on mothers of different race and ethnicity groups, we could not estimate costs of MMHCs for mothers in groups other than Non-Hispanic White, Non-Hispanic Black, or Hispanic. In addition, we based some estimates on national or state-level estimates not unique to racial and ethnic subgroups. We could not parse out effects of other confounders, such as socioeconomic status and systemic racism, using available literature. As a consequence, we recommend considering results with caution.

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