



# ADDENDUM TO SUPPLEMENTAL RESEARCH GUIDE ON MATERNAL MENTAL HEALTH

## Addendum to Supplemental Research Guide: Maternal Mental Health

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### Solutions

#### Educating Healthcare Workers to Address Maternal Mental Health

- **STIGMA AND LOW-QUALITY HEALTHCARE EXPERIENCES**
  - 43% of women with perinatal depression cite **stigma** as a perceived barrier to them pursuing mental health treatment.<sup>1</sup>
  - Among those who do not seek treatment despite (1) having a diagnosed mental disorder and (2) recognizing a need for treatment:
    - 63.8% desire to **handle the problem on their own**.<sup>2</sup>
    - 39.3% ceased treatment due to **perceived ineffectiveness** of treatment.<sup>3</sup>

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<sup>1</sup> Goodman, J. H. (2009). Women's attitudes, preferences, and perceived barriers to treatment for perinatal depression. *Birth*, 36(1), 60-69.

<sup>2</sup> Andrade, L. H. et al. 2014. "Barriers to Mental Health Treatment: Results from the WHO World Mental Health (WMH) Surveys." *Psychological medicine* 44(6): 1303–17.

<sup>3</sup> Andrade, L. H. et al. 2014. "Barriers to Mental Health Treatment: Results from the WHO World Mental Health (WMH) Surveys." *Psychological medicine* 44(6): 1303–17.

- 26.9% of respondents with severe disorders ceased treatment due to **negative experiences with treatment providers**.<sup>4</sup>
- **Is Psychiatric Medicine Use During Pregnancy Safe?**
  - Research suggests that medication/treatment is *not* the cause of adverse physical outcomes in neonatal children. Rather, the mental conditions cause bad outcomes.
  - Untreated depression was associated with higher risks of preterm births and low birth weight.<sup>5</sup> Since the depression was untreated, psychiatric medicine is not the cause.
- **Education of Healthcare Providers Legislation**
  - California Assembly Bill 3032: requires certain hospitals to develop programs that include, among other things, that hospital perinatal unit employees receive education/information about maternal mental health conditions.
  - California Assembly Bill 845: requires physicians and surgeons complete a course in maternal mental health as part of their career continuing education requirements.
  - Illinois House Bill 3511: requires healthcare providers in the perinatal unit to have education/information on maternal mental health conditions.<sup>6</sup>
  - Oregon House Bill 2235: requires the Oregon Health Authority to develop informational materials on maternal mental health for use by healthcare providers.
  - Virginia House Bill 2613: requires licensed nurse, midwife-, midwife-, or hospital-provided maternity care supply information to patients on perinatal anxiety, postpartum blues, depression, and infant safety.

### Develop and Improve Infrastructure for Telehealth Visits for Pregnant/Postpartum Women

- Among women with perinatal depression, the greatest perceived barriers to treatment are **a lack of time** (65%), **stigma** (43%), and **childcare issues** (33%).<sup>7</sup>

### State Solutions

- Arizona
  - Power Me A2Z: **pre-pregnancy health education** campaign. that provide information about the risks/benefits of behaviors that affect women's health

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<sup>4</sup> Andrade, L. H. et al. 2014. "Barriers to Mental Health Treatment: Results from the WHO World Mental Health (WMH) Surveys." *Psychological medicine* 44(6): 1303–17.

<sup>5</sup> Jarde, A., Morais, M., Kingston, D., Giallo, R., MacQueen, G. M., Giglia, L., ... & McDonald, S. D. (2016). Neonatal outcomes in women with untreated antenatal depression compared with women without depression: a systematic review and meta-analysis. *JAMA psychiatry*, 73(8), 826-837.

<sup>6</sup> [IL HB 3511 - IDPH - Maternal Mental Health](#)

<sup>7</sup> Goodman, J. H. (2009). Women's attitudes, preferences, and perceived barriers to treatment for perinatal depression. *Birth*, 36(1), 60-69.

before, during, and after pregnancy with the aim of improving certain behaviors such that the mother and infant have better health outcomes.<sup>8</sup>

- Arizona Senate Bill 1011: **mental health screening legislation** that establishes a maternal mental health advisory committee aimed at improving screening/treatment of maternal mental health challenges.<sup>9</sup>
- Arkansas
  - Arkansas Center for Addictions Research, Education, and Services (Arkansas CARES): **program addressing maternal substance use, depression, and parent-child attachment improvements**. Arkansas CARES provides services to mothers with both substance abuse and mental health problems. Women receive treatment in long-term residential settings with family support. Additional services include maternal and child healthcare and parent training.<sup>10 11</sup>
- California
  - MAMA'S Neighborhood: **Existing state-level maternal mental health program** is the standard of perinatal care in Los Angeles County, California. Initially aimed at reducing preterm births and low birthweights, this program provides care in the pregnancy, labor, delivery, and postpartum periods.<sup>12</sup>
  - Every Woman California: **pre-pregnancy education programs** that incorporate education as one component. These education interventions provide information about the risks/benefits of behaviors that affect women's health before, during, and after pregnancy with the goal of improving certain behaviors such that the mother and infant have better health outcomes.<sup>13</sup>
  - California Assembly Bill 2193: **screening requirements legislation**. This requires licensed health care practitioners who provide pre- or post-natal care to screen mothers for maternal mental health conditions.<sup>14</sup>
  - California Assembly Bill 577: **service requirements legislation** that mandates healthcare plans treat individuals diagnosed with a maternal mental health condition.<sup>15</sup>
  - California Assembly Bill 3032: **health care provider education legislation** that requires certain hospitals to develop programs that include, among other things, that hospital perinatal unit employees receive education/information about maternal mental health conditions.<sup>16</sup>

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<sup>8</sup> <https://www.countyhealthrankings.org/take-action-to-improve-health/what-works-for-health/strategies/preconception-education-interventions>

<sup>9</sup> [AZ SB 1011 - Maternal mental health; Advisory Committee](#)

<sup>10</sup> <https://www.methodistfamily.org/arkansas-cares.html>

<sup>11</sup> <https://www.cebc4cw.org/program/arkansas-center-for-addictions-research-education-and-services/detailed>

<sup>12</sup> MAMA'S Neighborhood (MAMA'S)

<sup>13</sup> <https://www.countyhealthrankings.org/take-action-to-improve-health/what-works-for-health/strategies/preconception-education-interventions>

<sup>14</sup> [CA AB 2193 - Maternal Mental Health](#)

<sup>15</sup> [CA AB 577 - Health Care Coverage: Maternal Mental Health](#)

<sup>16</sup> [CA AB 3032 - Maternal mental health conditions](#)

- California Assembly Bill 845: **health care provider education legislation** that requires physicians and surgeons to complete a course in maternal mental health as part of their career continuing education requirements.<sup>17</sup>
- California Assembly Bill 1893: **securing/utilizing federal funds legislation** that requires the Department of Public Health to investigate and apply for federal funding opportunities regarding maternal mental health.<sup>18</sup>
- California Senate Bill 104: **Medi-Cal coverage legislation** that extends Medi-Cal eligibility for a pregnant individual who is receiving health care coverage under the Medi-Cal program, or another specified program, and who has been diagnosed with a maternal mental health condition, for a period of one year following the last day of the individual's pregnancy if the individual complies with certain requirements.<sup>19</sup>
- Delaware
  - Delaware Thrives: **pre-pregnancy education** campaign that incorporates education as one component. These education interventions provide information about the risks/benefits of behaviors that affect women's health before, during, and after pregnancy with the aim of improving certain behaviors such that the mother and infant have better health outcomes.<sup>20</sup>
  - Delaware Senate Bill 197: **healthcare provider education requirements** related to maternal depression and how to screen for it.<sup>21</sup>
- Florida
  - Florida Senate Bill 138: **mental health education legislation** that requires public service announcements to educate the public on perinatal mental healthcare.<sup>22</sup>
  - Florida House Bill 937: **mental health services legislation** that requires perinatal mental health care information be provided by hotline, revises aspects of postpartum evaluation to include mental health and information on postpartum depression.<sup>23</sup>
- Illinois
  - Illinois House Bill 2438: **health insurance legislation** that requires health insurance plans provide quality, cost-effective maternal mental health coverage; requires medical professionals screen pre- and postpartum mothers for mental health conditions.<sup>24</sup>

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<sup>17</sup> [CA AB 845](#)

<sup>18</sup> [CA AB 1893 - Maternal Mental Health: Federal Funding](#)

<sup>19</sup> [CA SB 104 - Health](#)

<sup>20</sup> <https://www.countyhealthrankings.org/take-action-to-improve-health/what-works-for-health/strategies/preconception-education-interventions>

<sup>21</sup> [DE SB 197 - AN ACT TO AMEND TITLE 16 OF THE DELAWARE CODE RELATING TO MATERNAL MENTAL HEALTH](#)

<sup>22</sup> [FL SB 138](#)

<sup>23</sup> [FL HB 937 - Perinatal Mental Health](#)

<sup>24</sup> [IL HB 2438 - Maternal Mental Health](#)

- Illinois House Bill 3511: **health provider education legislation** that requires healthcare providers in the perinatal unit to have education on maternal mental health conditions.<sup>25</sup>
- Illinois House Bill 5: **mental health services legislation** that requires access to substance use and mental health services for pregnant and postpartum women; gender-responsive programs; trauma-informed programs (including those involving Post-Traumatic Stress Disorder); and programs serve women and young children.<sup>26</sup>
- Maryland
  - Maternal, Infant and Early Childhood Home Visiting Program (Maryland): **existing state-level maternal mental health program** providing statewide training and certification for home visitors to identify signs of maternal depression, substance abuse, domestic violence, and child behavior issues.<sup>27</sup>
  - Maryland Senate Bill 600: **public education** legislation that requires the state Department of Health and Mental Hygiene to identify and publicly provide information about perinatal mood (i.e. depression and bipolar) and anxiety disorders and develop program to address mental needs of women suffering from these disorders.<sup>28</sup>
  - Maryland Senate Bill 74: **task force legislation** establishes the Task Force to Study Maternal Mental Health.<sup>29</sup>
- Massachusetts
  - Massachusetts Child Psychiatry Access Project for Moms: **Existing state-level maternal mental health program** that provides a network of obstetric, pediatric, family medicine, psychiatric providers, and a group of counselors for women and their families to treat postpartum depression.<sup>30</sup>
  - Massachusetts House Bill 4859 (Massachusetts): **awareness and regulation legislation** that requires the state Department of Public Health to develop regulations, policies, and resources to address postpartum depression including, but not limited to, public and professional education curricula, plans, and materials; referral lists that build on existing resources; and the authorization of validated screening tools.<sup>31</sup>
- Minnesota
  - Postpartum Depression Screening Quality Improvement Project: **Existing state-level maternal mental health program** is a quality improvement project that develops and implements protocols for screening and referrals for postpartum depression in child visits within the first year of infants' life.<sup>32</sup>
- Missouri

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<sup>25</sup> [IL HB 3511 - IDPH - Maternal Mental Health](#)

<sup>26</sup> [IL HB 5 - Maternal Care](#)

<sup>27</sup> [Maternal, Infant and Early Childhood Home Visiting Program](#)

<sup>28</sup> [MD SB 600 - Public Health: Maternal Mental Health](#)

<sup>29</sup> [MD SB 74](#)

<sup>30</sup> [Massachusetts Child Psychiatry Access Project for Moms](#)

<sup>31</sup> [MA H 4859](#)

<sup>32</sup> [Postpartum Depression Screening Quality Improvement Project](#)

- Missouri House Bill 2120: **Medicaid/Medicare coverage legislation** that requires Medicaid and Medicare to cover behavioral health services for women up to one year postpartum.<sup>33</sup>
- New Jersey
  - New Jersey Senate Bill 213: **mandated depression screening legislation** that requires women be screened to evaluate risk of depression.<sup>34</sup>
  - New Jersey Senate Bill 3365: **referral requirements legislation** that establishes the services to which mothers may be referred to include home visitation programs; mental health and substance use disorder treatment; domestic violence support and intervention; transportation and housing assistance; and group prenatal counseling.<sup>35</sup>
  - New Jersey Assembly Bill 3633: **maternal mental health education legislation** that requires certain medical facilities to be provided with postpartum care information, including information concerning the potential health issues that may occur during the postpartum period and a description of the risks, warning signs, and symptoms of medically-significant complications that may occur during the postpartum period, including severe bleeding, high blood pressure, infection, and depression.<sup>36</sup>
  - New Jersey Senate Bill 705: **screening legislation** that requires the state Department of Health to develop and implement a plan to improve access to postpartum depression screening.<sup>37</sup>
- New York
  - New York Senate Bill 7409 and New York Assembly Bill 8308: **public access legislation** that requires the state Department of Health and Office of Mental Health to provide information on their website regarding how to locate available providers who treat or provide support for maternal depression.<sup>38</sup>
  - New York Assembly Bill 8953: **public access legislation** that requires the state Department of Health and Office of Mental Health provide information on how to locate providers who treat maternal depression.<sup>39</sup>
  - New York Assembly Bill 3016: **screening legislation** that requires maternal health care providers of pre- and postnatal care or pediatric care to the mother's infant to invite the mother to fill out a questionnaire to detect maternal depression.<sup>40</sup>

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<sup>33</sup> [MO HB 2120](#)

<sup>34</sup> [Mandated Screening through 2006 legislation S 213](#)

<sup>35</sup> [NJ S 3365](#)

<sup>36</sup> [NJ A 3633 - Establishes requirements concerning the provision of postpartum care information and the development of individualized postpartum care plans.](#)

<sup>37</sup> [NJ S 705](#)

<sup>38</sup> [NY S 7409 - Relates to maternal depression treatment](#)

<sup>39</sup> [NY A 8953](#)

<sup>40</sup> [NY A 3016](#)

- New York Senate Bill 7234 A: **education and screening requirements legislation** that relates to the provision of **maternal depression education**, screening guidelines, and referrals for treatment.<sup>41</sup>
- North Carolina
  - Every Woman North Carolina: **pre-pregnancy education** campaign that incorporates education as one component. These education interventions provide information about the risks/benefits of behaviors that affect women's health before, during, and after pregnancy with the aim of improving certain behaviors such that the mother and infant have better health outcomes.<sup>42</sup>
- Oregon
  - Oregon House Bill 2235: **healthcare provider education legislation** that requires the Oregon Health Authority to develop informational materials on maternal mental health for use by healthcare providers.<sup>43</sup>
  - Oregon House Bill 3625: **maternal mental health awareness legislation** that designates May of each year as Maternal Mental Health Awareness Month(Declares emergency making the legislation effective on passage.)<sup>44</sup>
- South Carolina
  - Screening, Brief Intervention and Referral to Treatment (SBIRT): **Existing state-level maternal mental health program** takes an evidence-based approach to the identification and treatment of substance (drug and alcohol) use, domestic violence, depression, and tobacco use among pregnant women and mothers up to 12 months postpartum. This program improves health outcomes of the mother and infant via strengthened attachment. It also addresses symptoms of substance use, domestic violence, and maternal depression.<sup>45</sup>
- Texas
  - Texas House Bill 2466: **Medicaid Coverage legislation** that modified Medicaid coverage for services related to maternal depression under the child health plan programs.<sup>46</sup>
  - Texas Senate Bill 750: **quality standards legislation** that sets quality standards for services related to maternal and newborn health care.<sup>47</sup>
  - Texas Senate Bill 147: **maternal mental health program legislation** that establishes and funds a maternal mental health peer support pilot program for perinatal mood and anxiety disorder.<sup>48</sup>

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<sup>41</sup> [NY S 7234 A](#)

<sup>42</sup> <https://www.countyhealthrankings.org/take-action-to-improve-health/what-works-for-health/strategies/preconception-education-interventions>

<sup>43</sup> [OR HB 2235 - "Relating to maternal mental health; and declaring an emergency."](#)

<sup>44</sup> [OR HB 3625 - Relating to Maternal Mental Health Awareness Month; and Declaring an Emergency](#)

<sup>45</sup> [Screening, Brief Intervention and Referral to Treatment \(SBIRT\)](#)

<sup>46</sup> [TX HB 2466](#)

<sup>47</sup> [TX SB 750](#)

<sup>48</sup> [Texas SB 147](#)

- Texas Senate Bill 17: **maternal health and safety legislation** relating to pregnancy-related deaths and maternal morbidity, including causes such as postpartum depression.<sup>49</sup>
- TX HB 253 (Texas): **screening, referral, treatment, and services legislation** that requires the state Health and Human Services Commission to develop and implement a five-year strategic plan to improve access to postpartum depression screening, referral, treatment, and support services.<sup>50</sup>
- Utah
  - Power Your Life, Power Your Health: **pre-pregnancy education** campaign that incorporates education as one component. These education interventions provide information about the risks/benefits of behaviors that affect women's health before, during, and after pregnancy with the goal of improving certain behaviors such that the mother and infant have better health outcomes.<sup>51</sup>
  - Utah Senate Bill 135: **home visit programs legislation** that requires the Department of Health to study the use of evidence-based home visit programs in the state and report its findings to the legislature.<sup>52</sup>
- Virginia
  - Virginia House Bill 2613: **health care provider training legislation** that requires licensed nurse midwife-, midwife-, or hospital-provided maternity care to supply information to patients on perinatal anxiety, postpartum blues, depression, and infant safety.<sup>53</sup>
  - BabyCare: **existing state-level maternal mental health program** that is a Medicaid-sponsored home visit program for pregnant women and mothers of infants up to two years of age. The program helps mothers learn about their child's development and find medical care. This program improves maternal knowledge of mother-infant attachment.
- West Virginia
  - West Virginia Senate Bill 307: **depression screening legislation** that requires women be screened to evaluate risks of depression.<sup>54</sup>

## Wider Importance of Maternal Mental Health

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<sup>49</sup> [TX HB 253](#)

<sup>50</sup> [TX HB 253](#)

<sup>51</sup> <https://www.countyhealthrankings.org/take-action-to-improve-health/what-works-for-health/strategies/preconception-education-interventions>

<sup>52</sup> [UT SB 135 - Maternal and Child Health](#)

<sup>53</sup> [VA HB 2613](#)

<sup>54</sup> [Mandated screening through SB 307](#)



## Importance of Maternal Mental Health to Whole Families

- Maternal depression (pre- and post-natal) is associated with poor family functioning,<sup>55 56 57</sup> lower marital satisfaction,<sup>58</sup> and low social support<sup>59 60 61</sup>
  - Mothers with pre- and post-natal depression are at increased risk of compromised social functioning.<sup>62</sup>
  - Maternal depression is associated with family conflict and stressful life events.<sup>63</sup>

## Importance of Maternal Mental Health to Children/The Next Generation

- SUMMARY: research suggests parental mental illness transfers onto the next generation through poor maternal sensitivity and mother-infant attachment. Efforts to reduce the effects of maternal mental illness on children should **focus on raising maternal sensitivity and repairing mother-infant attachment.**
- **How Does Maternal Mental Health Effect Children's Mental Health? Two Connectors**
  - **Connection 1—Maternal Sensitivity:** this is a collective term for various affective and behavioral caregiving attributes. This is synonymous with maternal responsiveness and competency.<sup>64</sup>
    - **Factors that Facilitate and Impair Maternal Sensitivity:** Social support (partner, social network, financially, etc.), maternal-fetal attachment, and high

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<sup>55</sup> McCue Horwitz, Sarah, Margaret J Briggs-Gowan, Amy Storfer-Isser, and Alice S Carter. 2007. "Prevalence, Correlates, and Persistence of Maternal Depression." *Journal of women's health* 16(5): 678–91

<sup>56</sup> Yim, Ilona S., et al. "Biological and Psychosocial Predictors of Postpartum Depression: Systematic Review and Call for Integration." *Annual Review of Clinical Psychology*, vol. 11, no. 1, Annual Reviews Inc., Mar. 2015, pp. 99–137, doi:10.1146/annurev-clinpsy-101414-020426.

<sup>57</sup> Lorant, V., Delière, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American journal of epidemiology*, 157(2), 98-112.

<sup>58</sup> Seifer, R., Dickstein, S., Sameroff, A. J., Magee, K. D., & Hayden, L. C. (2001). Infant mental health and variability of parental depression symptoms. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40(12), 1375-1382.

<sup>59</sup> McCue Horwitz, Sarah, Margaret J Briggs-Gowan, Amy Storfer-Isser, and Alice S Carter. 2007. "Prevalence, Correlates, and Persistence of Maternal Depression." *Journal of women's health* 16(5): 678–91

<sup>60</sup> Yim, Ilona S., et al. "Biological and Psychosocial Predictors of Postpartum Depression: Systematic Review and Call for Integration." *Annual Review of Clinical Psychology*, vol. 11, no. 1, Annual Reviews Inc., Mar. 2015, pp. 99–137, doi:10.1146/annurev-clinpsy-101414-020426.

<sup>61</sup> Lorant, V., Delière, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American journal of epidemiology*, 157(2), 98-112.

<sup>62</sup> Weinberg, M Katherine, and Edward Z Tronick. 1998. "The Impact of Maternal Psychiatric Illness on Infant Development." *The Journal of clinical psychiatry*.

<sup>63</sup> Lorant, V., Delière, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American journal of epidemiology*, 157(2), 98-112.

<sup>64</sup> Shin, H., Park, Y. J., Ryu, H., & Seomun, G. A. (2008). Maternal sensitivity: A concept analysis. *Journal of Advanced Nursing*, 64(3), 304-314.

- maternal self-esteem facilitate maternal sensitivity.<sup>65</sup> Maternal depression, stress, and anxiety impair maternal sensitivity.<sup>66</sup>
- **Higher levels of education** and **family income** explain differences in maternal sensitivity. Insecure low-income mothers are particularly at risk for low maternal sensitivity.<sup>67</sup>
    - **Connection 2—Mother-Child Attachment:** This is the tendency of young children to seek contact with and be comforted by caregivers when frightened, worried, or vulnerable.<sup>68</sup>
  - **Intergenerational Transfer of Mental Illness:** Parents ‘transmit’ risk of mental illness to their children through impaired parent-child attachment relationships (related to low maternal sensitivity).<sup>69</sup>
    - **Mother-Child Relationship:** Depressed mothers are less sensitively attuned<sup>70</sup> and responsive<sup>71</sup> to their infants, disengaged from the child,<sup>72</sup> and have compromised maternal-infant social functioning.<sup>73</sup>
    - Children of depressed mothers have brain activity that mirrors depressed adults.<sup>74</sup> Studies suggest that **parents’ mental illness interferes with development and is associated with lifetime adverse behavior.**<sup>75</sup>

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<sup>65</sup> Shin, H., Park, Y. J., Ryu, H., & Seomun, G. A. (2008). Maternal sensitivity: A concept analysis. *Journal of Advanced Nursing*, 64(3), 304-314.

<sup>66</sup> Shin, H., Park, Y. J., Ryu, H., & Seomun, G. A. (2008). Maternal sensitivity: A concept analysis. *Journal of Advanced Nursing*, 64(3), 304-314.

<sup>67</sup> van DOESUM, K. T., Hosman, C. M., Riksen-Walraven, J. M., & Hoefnagels, C. (2007). Correlates of depressed mothers' sensitivity toward their infants: the role of maternal, child, and contextual characteristics. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(6), 747-756.

<sup>68</sup> Fearon, R. P., & Roisman, G. I. (2017). Attachment theory: progress and future directions. *Current Opinion in Psychology*, 15, 131-136.

<sup>69</sup> van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2019). Bridges across the intergenerational transmission of attachment gap. *Current opinion in psychology*, 25, 31-36.

<sup>70</sup> Murray, Lynne, Agnese Fiori-Cowley, Richard Hooper, and Peter Cooper. 1996. "The Impact of Postnatal Depression and Associated Adversity on Early Mother-Infant Interactions and Later Infant Outcome." *Child Development* 67(5): 2512–26.

<sup>71</sup> van DOESUM, K. T., Hosman, C. M., Riksen-Walraven, J. M., & Hoefnagels, C. (2007). Correlates of depressed mothers' sensitivity toward their infants: the role of maternal, child, and contextual characteristics. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(6), 747-756.

<sup>72</sup> Lovejoy, M. Christine, Patricia A Graczyk, Elizabeth O'Hare, and George Neuman. 2000. "Maternal Depression and Parenting Behavior: A Meta-Analytic Review." *Clinical Psychology Review* 20(5): 561–92.

<sup>73</sup> Weinberg, M Katherine, and Edward Z Tronick. 1998. "The Impact of Maternal Psychiatric Illness on Infant Development." *The Journal of clinical psychiatry*.

<sup>74</sup> Dawson, G., Frey, K., Panagiotides, H., Osterling, J., & Hessler, D. (1997). Infants of depressed mothers exhibit atypical frontal brain activity a replication and extension of previous findings. *Journal of child Psychology and Psychiatry*, 38(2), 179-186.

<sup>75</sup> Newport, D. Jeffrey, Zachary N. Stowe, and Charles B. Nemeroff. 2002. "Parental Depression: Animal Models of an Adverse Life Event." *American Journal of Psychiatry* 159(8): 1265–83

- **Physical Effects on Children:** Prenatal depression is associated with preterm birth,<sup>76 77 78</sup> low birth weight,<sup>79 80</sup> smaller newborn head circumference,<sup>81</sup> and altered newborn immune functioning.<sup>82</sup> Newborns display poor motor skills, activity, coordination, resilience,<sup>83 84</sup> and have worse long-term health outcomes.<sup>85</sup>
  - High stress during pregnancy affects child birthweight,<sup>86</sup> head circumference,<sup>87</sup> and premature birth.<sup>88</sup>
  - **Physical Effects of Substance Use Disorders:** Smoking during pregnancy negatively affects birth weight and newborn head circumference.<sup>89 90</sup> Prenatal

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<sup>76</sup> Jarde, A., Morais, M., Kingston, D., Giallo, R., MacQueen, G. M., Giglia, L., ... & McDonald, S. D. (2016). Neonatal outcomes in women with untreated antenatal depression compared with women without depression: a systematic review and meta-analysis. *JAMA psychiatry*, 73(8), 826-837.

<sup>77</sup> Orr, Suzanne T., and C. Arden Miller. 1995. "Maternal Depressive Symptoms and the Risk of Poor Pregnancy Outcome." *Epidemiologic Reviews* 17(1): 165–71.

<sup>78</sup> Diego, M. A., Field, T., Hernandez-Reif, M., Schanberg, S., Kuhn, C., & Gonzalez-Quintero, V. H. (2009). Prenatal depression restricts fetal growth. *Early human development*, 85(1), 65-70.

<sup>79</sup> Jarde, A., Morais, M., Kingston, D., Giallo, R., MacQueen, G. M., Giglia, L., ... & McDonald, S. D. (2016). Neonatal outcomes in women with untreated antenatal depression compared with women without depression: a systematic review and meta-analysis. *JAMA psychiatry*, 73(8), 826-837.

<sup>80</sup> Orr, Suzanne T., and C. Arden Miller. 1995. "Maternal Depressive Symptoms and the Risk of Poor Pregnancy Outcome." *Epidemiologic Reviews* 17(1): 165–71.

<sup>81</sup> Orr, Suzanne T., and C. Arden Miller. 1995. "Maternal Depressive Symptoms and the Risk of Poor Pregnancy Outcome." *Epidemiologic Reviews* 17(1): 165–71.

<sup>82</sup> Mattes, E., McCarthy, S., Gong, G., van Eekelen, J. A. M., Dunstan, J., Foster, J., & Prescott, S. L. (2009). Maternal mood scores in mid-pregnancy are related to aspects of neonatal immune function. *Brain, behavior, and immunity*, 23(3), 380-388.

<sup>83</sup> Lyons-Ruth, Karlen, Rebecca Wolfe, and Amy Lyubchik. 2000. "Depression and the Parenting of Young Children: Making the Case for Early Preventive Mental Health Services." *Harvard Review of Psychiatry* 8(3): 148–53.

<sup>84</sup> Suri, R., Lin, A. S., Cohen, L. S., & Altshuler, L. L. (2014). Acute and long-term behavioral outcome of infants and children exposed in utero to either maternal depression or antidepressants: a review of the literature. *The Journal of clinical psychiatry*, 75(10), 1142-1152.

<sup>85</sup> Gump, B. B., Reihman, J., Stewart, P., Lonky, E., Darvill, T., Granger, D. A., & Matthews, K. A. (2009). Trajectories of maternal depressive symptoms over her child's life span: Relation to adrenocortical, cardiovascular, and emotional functioning in children. *Development and Psychopathology*, 21(1), 207-225.

<sup>86</sup> Lou, Hans C et al. 1994. "Prenatal Stressors of Human Life Affect Fetal Brain Development." *Developmental Medicine & Child Neurology* 36(9): 826–32.

<sup>87</sup> Lou, Hans C et al. 1994. "Prenatal Stressors of Human Life Affect Fetal Brain Development." *Developmental Medicine & Child Neurology* 36(9): 826–32.

<sup>88</sup> Diego, M. A., Field, T., Hernandez-Reif, M., Schanberg, S., Kuhn, C., & Gonzalez-Quintero, V. H. (2009). Prenatal depression restricts fetal growth. *Early human development*, 85(1), 65-70.

<sup>89</sup> Lou, Hans C et al. 1994. "Prenatal Stressors of Human Life Affect Fetal Brain Development." *Developmental Medicine & Child Neurology* 36(9): 826–32.

<sup>90</sup> Mamluk, L., Jones, T., Ijaz, S., Edwards, H., Savovic, J., Leach, V., ... & Zuccolo, L. (2020). Evidence of detrimental effects of prenatal alcohol exposure on offspring birthweight and neurodevelopment from a systematic review of quasi-experimental studies. *International journal of epidemiology*.

alcohol exposure negatively impacts cognitive outcomes and results in worse mental health in children.<sup>91</sup>

- ***Mental and Social Effects on Children:*** Long-term consequences of maternal depression in children include disruptive social behavior<sup>92</sup> and depression.<sup>93</sup>
  - Perinatal maternal anxiety has a small adverse effect on children's emotional outcomes,<sup>94</sup> negative infant temperament, and worse attentional regulation.<sup>95</sup>
  - *Gendered Effects on Children:* Male infants are more vulnerable to maternal depression, but females with chronically depressed mothers experience more internalized distress and dysphoric moods than their male counterparts.<sup>96</sup>
    - *Effects on Infants:* Disturbed mother-child interactions are associated with poorer infant outcomes at 18 months,<sup>97</sup> which negatively biases other interactions between mothers and their infants.<sup>98</sup> Infants of depressed mothers have brain activity that mirrors depressed adults.<sup>99</sup>
    - *Effects on Children:* School-aged children of depressed mothers have elevated externalizing behavior problems, decreased social competence,

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<sup>91</sup> Mamluk, L., Jones, T., Ijaz, S., Edwards, H., Savovic, J., Leach, V., ... & Zuccolo, L. (2020). Evidence of detrimental effects of prenatal alcohol exposure on offspring birthweight and neurodevelopment from a systematic review of quasi-experimental studies. *International journal of epidemiology*.

<sup>92</sup> Suri, R., Lin, A. S., Cohen, L. S., & Altshuler, L. L. (2014). Acute and long-term behavioral outcome of infants and children exposed in utero to either maternal depression or antidepressants: a review of the literature. *The Journal of clinical psychiatry*, 75(10), 1142-1152.

<sup>93</sup> Suri, R., Lin, A. S., Cohen, L. S., & Altshuler, L. L. (2014). Acute and long-term behavioral outcome of infants and children exposed in utero to either maternal depression or antidepressants: a review of the literature. *The Journal of clinical psychiatry*, 75(10), 1142-1152.

<sup>94</sup> Rees, S., Channon, S., & Waters, C. S. (2019). The impact of maternal prenatal and postnatal anxiety on children's emotional problems: a systematic review. *European child & adolescent psychiatry*, 28(2), 257-280.

<sup>95</sup> Thomas, J. C., Letourneau, N., Campbell, T. S., Tomfohr-Madsen, L., Giesbrecht, G. F., & APron Study Team. (2017). Developmental origins of infant emotion regulation: Mediation by temperamental negativity and moderation by maternal sensitivity. *Developmental Psychology*, 53(4), 611-628.

<sup>96</sup> Campbell, Susan B., Antonio A. Morgan-Lopez, Martha J. Cox, and Vonnie C. McLoyd. 2009. "A Latent Class Analysis of Maternal Depressive Symptoms over 12 Years and Offspring Adjustment in Adolescence." *Journal of abnormal psychology* 118(3): 479-93.

<sup>97</sup> Murray, Lynne, Agnese Fiori-Cowley, Richard Hooper, and Peter Cooper. 1996. "The Impact of Postnatal Depression and Associated Adversity on Early Mother-Infant Interactions and Later Infant Outcome." *Child Development* 67(5): 2512-26.

<sup>98</sup> Tronick, E., & Reck, C. (2009). Infants of depressed mothers. *Harvard review of psychiatry*, 17(2), 147-156.

<sup>99</sup> Diego, M. A., Field, T., Jones, N. A., & Hernandez-Reif, M. (2006). Withdrawn and intrusive maternal interaction style and infant frontal EEG asymmetry shifts in infants of depressed and non-depressed mothers. *Infant Behavior and Development*, 29(2), 220-229.

- reduced frontal brain activation, more depressive symptoms,<sup>100 101</sup> and increased hyperactivity/attention problems.<sup>102</sup>
- **Effects on Adolescents:** Adolescents of chronically depressed mothers have more behavioral problems and engage in more risky behaviors.<sup>103</sup>
  - **Associated Factors:** Maternal depression often occurs alongside other factors that undermine child development, including young motherhood, **social isolation**, economic and educational deprivation, family conflict, and stressful life events.<sup>104</sup>

### Maternal Mortality as a Public Health Crisis

- **Maternal Mortality and Suicide:** Women with postpartum psychiatric disorders have a higher mortality rate and risk of suicide.
  - Unnatural causes of death represent 40.6% of fatalities among women with psychiatric disorders.<sup>105</sup>
  - Suicide is the leading cause of maternal mortality.<sup>106</sup>
- **Intimate Partner Violence Leads to Maternal Mortality/Suicide:** Intimate partner conflicts may contribute to 54.3% of pregnancy-associated suicides and 45.3% of pregnancy-related homicides are associated with intimate partner violence.<sup>107</sup> Women with a history of intimate partner violence are more likely to have mental health disorders.<sup>108</sup>

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<sup>100</sup> Gump, B. B., Reihman, J., Stewart, P., Lonky, E., Darvill, T., Granger, D. A., & Matthews, K. A. (2009). Trajectories of maternal depressive symptoms over her child's life span: Relation to adrenocortical, cardiovascular, and emotional functioning in children. *Development and Psychopathology*, 21(1), 207-225.

<sup>101</sup> Murray, L., Arteche, A., Fearon, P., Halligan, S., Goodyer, I., & Cooper, P. (2011). Maternal postnatal depression and the development of depression in offspring up to 16 years of age. *Journal of the American Academy of Child & Adolescent Psychiatry*, 50(5), 460-470.

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<sup>104</sup> Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., & Anseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American journal of epidemiology*, 157(2), 98-112.

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<sup>106</sup> Kimmel, Mary. "Maternal mental health matters." *North Carolina medical journal* 81.1 (2020): 45-50.

<sup>107</sup> Palladino, C. L., Singh, V., Campbell, J., Flynn, H., & Gold, K. (2011). Homicide and suicide during the perinatal period: findings from the National Violent Death Reporting System. *Obstetrics and gynecology*, 118(5), 1056.

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