

Landscape of Maternal Mortality, Maternal Mental Health and Community-Based Interventions in the United States and Southwestern Pennsylvania

by

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Submitted to the Graduate Faculty of the
School of Public Health in partial fulfillment
of the requirements for the degree of
Master of Public Health

University of Pittsburgh

2023

UNIVERSITY OF PITTSBURGH

SCHOOL OF PUBLIC HEALTH

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April 19, 2023

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2023

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Abstract

Maternal mortality in the United States is on the rise. A majority of maternal mortality deaths in Pennsylvania are due to preventable causes relating to mental health and substance use. This essay contributes to public health relevance by identifying interventions to implement in Southwestern Pennsylvania using a literature scan and the socioecological framework. This essay describes maternal mental health in both the national and local (Pennsylvania) landscapes, reviews recent research literature related to maternal mental health interventions and barriers to care, and introduces policy and programmatic intervention recommendations to reduce maternal mortality related to mental health for national, state, and Southwestern Pennsylvania. This essay also identifies community-based organizations that work to support reproductive health and mental health in Allegheny County with the goal of informing direct action at the community level.

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1.0 Introduction

The state of maternal mortality in the United States is dire. In 2020, the U.S. maternal mortality ratio was 23.8 deaths per 100,000 live births, that number growing 18% from 2019 (Hoyert, Maternal Mortality Rates in the United States, 2020, 2022). In 2021 the ratio increased to 32.9 deaths per 100,000 live births (Hoyert, Maternal Mortality Rates in the United States, 2021, 2023). This precipitous increase, year over year, indicates a growing problem that should be prioritized and addressed.

The majority of maternal deaths in the United States are attributable to hemorrhage or cardiovascular conditions (referred to as medical causes), self-harm and substance use contribute to an increasing percentage of maternal deaths (referred to as nonmedical causes). Nonmedical causes of deaths include suicide, accidental drug poisoning, or violence and exist outside of a medical or biological reason for mortality (Collier & Molina, 2019). Currently, the United States health care system works to address medical maternal deaths, but an emphasis must be put on nonmedical causes of deaths to address the whole scope of causes and contributors to maternal death in the United States (Collier & Molina, 2019). The CDC distinguishes *pregnancy-associated death* (the death of a person while pregnant or within one year of pregnancy, regardless of cause, which may be related or unrelated to pregnancy, from *pregnancy-related death* (the death of a person while pregnant or within one year of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy) (Centers for Disease Control and Prevention, 2022). This paper explores the distinction between medical causes and nonmedical causes of maternal mortality and recommends supporting a robust mental health and crisis response.

1.1 Essay Overview

This essay reviews maternal mental health from a socioecological model framework to describe interplay between national and state policies and community and organizational relationships that address and intervene in maternal mortality. The socioecological model describes the relationships and interplay between individual and environmental factors that exist in the context of an issue and is used to explore influencing and contributing factors to prevalence, prevention, and evaluation (Kilanowski, 2017). Reviewing the current state of maternal health in the United States and Pennsylvania, this essay first discusses the current state of maternal mortality and maternal mental health at the societal level. The essay then reviews the current research from 2017-2022 on maternal health and maternal mental health interventions to reduce maternal mortality. According to the data from the CDC on maternal mortality, approximately 23% of pregnancy-related deaths in the United States are associated with suicide, substance use, or another mental health condition (Trost, et al., 2022). Mental health concerns, like depression, are the most underdiagnosed complication during the pregnancy and postpartum period in the United States (The Committee on Psychosocial Aspects of Child and Family Health, 2010). Addressing mental health issues and substance use during pregnancy is an important way to prevent maternal death. This essay details current research and interventions addressing maternal mental health and substance use through a socioecological model to inform community-based and policy-based interventions to address preventable maternal death. Finally, this essay recommends community-based solutions and interventions for Forward Allies for Equity in Mental and Reproductive Health (Forward Allies) in Southwestern Pennsylvania. Forward Allies, is a nonprofit based in Pittsburgh supporting equitable access to mental and reproductive healthcare and raising awareness of and preventing reproductive loss due to suicide (Forward Allies for Equity in Mental and Reproductive

Health, 2019). Forward Allies currently provides training for mental health providers on reproductive mental health, trauma-informed care, and anti-bias work. Additionally, Forward Allies engages in policy advocacy around pro-abortion legislation, improving parental leave policies, single-payer healthcare, and policies that reduce maternal morbidity and mortality rates on a national scale. Forward Allies also provides a mental health fund for families to access who cannot afford to pay for reproductive mental health care and aims to reduce barriers for families to those appointments by providing childcare and transportation stipends. This paper intends to provide evidence-based recommendations to raise awareness about Forward Allies and provide recommendations for advocacy opportunities around maternal mental health and substance use.

This essay describes maternal mental health in both the national and local (Pennsylvania) landscapes, reviews recent research literature related to maternal mental health interventions and barriers to care, and introduces policy and programmatic intervention recommendations to reduce maternal mortality related to mental health for national, state, and Southwestern Pennsylvania. This essay identifies community-based organizations that work to support reproductive health and mental health in Allegheny County with the goal of informing direct action at the community level.

1.2 Background

Current rates and causes of maternal mortality, both national and for the state of Pennsylvania are presented in this section along with societal factors that contribute to maternal mortality and maternal mental health both nationally and in Pennsylvania. This section also reviews the current state of access to care for pregnant and postpartum people and describes existing programs in Pennsylvania intended to reduce maternal deaths. Finally, this section

describes disparities in maternal health at a national, state, and local level between Black and White pregnant and postpartum people.

1.2.1 Identifying the Issue: Nationwide

The overall United States maternal mortality rate is 32.9 deaths per 100,000 live births (Hoyert, Maternal Mortality Rates in the United States, 2021, 2023). Stark racial disparities further exacerbate this crisis: for Black women, that number is 69.9 deaths per 100,000 live births, 2.6 times as high as their White counterparts (Hoyert, Maternal Mortality Rates in the United States, 2021, 2023).

Overall, medical causes such as hemorrhage, cardiovascular/coronary conditions, cardiomyopathy, or infection account for half of all maternal deaths in the United States. Risk factors of medical maternal mortality include: higher maternal age and chronic conditions like obesity, diabetes, and cardiovascular disorders. According to a 2018 report, for White women, mental health conditions were the leading cause of death. In the same year, for Black women, preeclampsia, eclampsia and embolism are the leading causes of maternal death (Collier & Molina, 2019).

Nonmedical causes of maternal death, including suicide, self-harm, unintentional accidental drug poisoning, and intimate partner violence also account for a significant percentage of maternal mortality nationwide. Suicide ideation is common in pregnancy, affecting approximately 23% of pregnant people; suicide may account for up to 20% of maternal deaths (Lindahl, Pearson, & Colpe, 2005) (Campbell, Matoff-Stepp, Velez, Hunter Cox, & Laughon, 2021). Risk factors of maternal death by suicide include: previous attempts at suicide, suicide ideation during pregnancy, a history of depression, substance use disorder, and experience with

intimate partner violence or conflict (Campbell, Matoff-Stepp, Velez, Hunter Cox, & Laughon, 2021). Suicide remains a preventable cause of death and supporting pregnant people by recognizing mental health as an important facet of pregnancy care would reduce maternal mortality nationwide (Brown, Adams, George, & Moore, 2022).

1.2.1.1 Mental Health-Related Maternal Mortality

Mental health is a crisis in the United States. One half of all Americans will receive a mental health diagnosis in their lifetimes, and suicide is a leading cause of death. Approximately 12 million Americans seriously considered suicide in 2020 (Centers for Disease Control and Prevention, 2022). Perinatal depression is a major contributor to maternal death by suicide and is the most common complication for pregnant and postpartum people (The Committee on Psychosocial Aspects of Child and Family Health, 2010). Perinatal mental health conditions affect one in five pregnancies in the United States and disproportionately affect low income pregnant and postpartum people who are less likely able to access or receive screenings for care (Griffen, et al., 2021).

Further, of pregnancy-related mental health deaths, 63% occur in people whose pregnancy is covered by Medicaid (Chin, Wendt, Bennett, & Bhat, 2022). Medicaid pays for 50% of all births in the United States and 65% of births to Black mothers (Solomon, 2021). Current data shows that the Affordable Care Act (ACA) Medicaid expansions led to an increase in preconception and postpartum coverage for low-income birthing people which increased the use of outpatient care before, during, and after pregnancy (Steenland & Wherry, 2023). Medicaid expansions also led to a decline in self-reported prepregnancy depression by 16% (Margerison, Hettinger, Kaestner, Goldman-Mellor, & Gartner, 2021). Expanding access to prenatal and postnatal care and mental health care, particularly for Medicaid qualifying individuals, may improve perinatal mental health,

which may, ultimately, reduce maternal death related to mental health issues (Margerison, Hettinger, Kaestner, Goldman-Mellor, & Gartner, 2021).

Barriers to mental health care include: a dearth of culturally appropriate mental health care providers, systemic racism, lack of access to health care because of logistical barriers, which include childcare and transportation, and hesitancy to disclose for fear of triggering involvement of child protective services or customs and immigration (Griffen, et al., 2021).

1.2.1.2 Suicide

Of suicide deaths related to pregnancy, 86% of deaths occurred in White people, which demographically departs from the racial and ethnic distribution of pregnancy-related deaths due to other causes (Chin, Wendt, Bennett, & Bhat, 2022). The Chin, Wendt, Bennett, & Bhat “Suicide and Maternal Mortality” study acknowledges that racial and ethnic differences in maternal mortality can be difficult to evaluate due to the “other” category identifying race/ethnicity on death certificates. Additionally, a National Survey on Drug Use and Health found that all racial/ethnic groups of women in their third trimester of pregnancy were less likely to be suicidal in comparison to black non-Hispanic women (Kitsantas, Aljoudi, Adams, & Booth, 2020). Risk factors for all pregnant people for perinatal suicidality include: birthing at a younger age, single parenting, marital dissatisfaction, history of mental illness, a history of trauma or abuse (including Intimate Partner Violence), substance use, and pregnancy loss (Chin, Wendt, Bennett, & Bhat, 2022).

1.2.1.3 Intimate Partner Violence

Intimate partner violence (IPV) and pregnancy-associated homicide are nonmedical causes of maternal mortality that account for 8.4% of maternal and pregnancy-related deaths (Campbell, Matoff-Stepp, Velez, Hunter Cox, & Laughon, 2021). Pregnancy is an extremely dangerous period

for people experiencing IPV, with a 35% greater risk of homicide for pregnant and postpartum people as opposed to those who are not pregnant or postpartum (Wallace, 2022). Guns and firearms are involved in over half of all pregnancy-related homicides (Campbell, Matoff-Stepp, Velez, Hunter Cox, & Laughon, 2021). Currently, in certain states, including Pennsylvania, IPV-related firearm protections are only effective against partners of victims of IPV if they are legally married, creating a gap in protection for victims who are dating or living with their abusers (Rochford, Berg, & Peek-Asa, 2022). This gap is colloquially known as the “boyfriend loophole”. Although IPV is a nonmedical cause of maternal mortality, this essay discusses IPV only as a risk factor for maternal suicide and substance use during the pregnancy and postpartum period.

1.2.1.4 Substance Use

Perinatal substance use is another serious issue that contributes to maternal mental health and maternal mortality. Substance use includes tobacco, alcohol, and opioids/illicit substances. The CDC reports that 13.5% of pregnant people in 2018-2020 reported drinking during their pregnancy and, 7.2% of pregnant people in 2016 smoked cigarettes during pregnancy; data from 1999-2014 shows a more than quadrupling rate of opioid use during pregnancy (Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, 2022). The opioid rate increase follows the national trend of increasing opioid use and prescribing rates among all people. Between 2015-2019, drug and alcohol related maternal mortality increased from 4.3 deaths per 100,000 live births to 8.8 deaths per 100,000 live births (Howard, Sparks, & Santos-Lozada, 2021).

1.2.2 Identifying the Issue: Pennsylvania and Allegheny County

The Pennsylvania Maternal Mortality Review Committee (MMRC) was established under the Maternal Mortality Review Act (Act 24 of 2018) to “systematically review all maternal deaths, identify root causes of these deaths, and develop strategies to reduce preventable morbidity, mortality, and racial disparities related to pregnancy and Pennsylvania”. Since 2018, the MMRC has reviewed each maternal death in the state to determine contributing factors, including: obesity, discrimination, mental health conditions, and substance use disorder. In Pennsylvania in 2018, the overall pregnancy-associated maternal mortality ratio was 82 deaths per 100,000 live births (Pennsylvania Bureau of Family Health, 2022). For White women in Pennsylvania, the rate was 79 per 100,000 live births while for Black women, the pregnancy associated mortality ratio was 163 per 100,000 live births, over two times the rate for White women in Pennsylvania.

Below, find presented the MMRC’s table of the top causes of Death for All Maternal Deaths in Pennsylvania, excluding Philadelphia County.

Table 1. Causes of Death for Maternal Death in Pennsylvania, 2018

Top causes of Death for All Maternal Deaths (Excluding Philadelphia County) in 2018 (N=85)		
Cause of Death	Number of Deaths	Overall Percentage
Accidental poisoning	43	51%
Other Direct Obstetric Deaths	9	11%
Transportation Accidents	7	8%
Assault	7	8%
Other pregnancy related	4	5%
Intentional Self-Harm	4	5%

Of the 111 total maternal deaths from pregnancy in Pennsylvania, accidental drug poisoning accounted for over half, making it the leading cause of maternal mortality in the state. Intentional self-harm accounted for 5% of maternal deaths and is one of the top five causes of maternal death in the state (Pennsylvania Bureau of Family Health, 2022).

According to MMRC determinations, 39% of maternal deaths in Pennsylvania in 2018 were classified as having mental health conditions, other than substance use disorder, as a contributing factor to the death (Pennsylvania Bureau of Family Health, 2022). In a survey done in February 2021 of Pennsylvania adults, 39.8% of respondents reported symptoms of anxiety and depression and 25.7% reported being unable to access counseling or therapy. The most impactful barriers to care for Pennsylvanians are cost and access to mental health professionals. In Pennsylvania, 1.7 million people live in a community that does not have enough mental health professionals (NAMI Keystone Pennsylvania, 2021).

Overall, the MMRC determined that 92% of maternal deaths in Pennsylvania were preventable. With this high rate of preventable mortality, the MMRC recommended: building infrastructure to identify and support postpartum individuals with mental health concerns, substance use, and a history of intimate partner violence as well as more comprehensive care for all pregnant and postpartum people in the state (Pennsylvania Bureau of Family Health, 2022).

1.2.2.1 Lack of Access to Maternity Care

While a high percentage of counties in Pennsylvania have access to maternity care, the distribution per county and number of providers in each county may be low. According to a 2022 March of Dimes report, 9% of Pennsylvania counties are considered maternity care deserts and 19.4% of counties have low or moderate access in the state; 28.4% of counties have no hospital or birth center offering maternity care. Access to maternity care includes obstetric providers including

OB/GYNs and Certified Nurse Midwives but does not include information about birth or postpartum doulas. While Pennsylvania ranks lower in the rankings of maternity care deserts than other states, the maternal mortality rate is significantly higher than the national average. This is important to note as access to care is not necessarily indicative of a state's maternal mortality rate, particularly in addressing deaths due to accidental drug poisoning or self-harm. (March of Dimes, 2020)

1.2.2.2 Health Insurance Coverage

Statewide, 62.7% of counties have a higher percentage of women without health insurance than the state average of 6.4% for both men and women. The state average for women without health insurance is relatively low, but, the distribution of the numbers shows that a majority of the counties in the state, particularly rural counties, have higher percentages of uninsured women than the state average. Of note are the rural counties of Juniata and Lancaster counties which have a 9.5% and 10.3% uninsured rate, respectively. Comparatively, in Philadelphia County, the county with the most number of births in the state with 19,884 in 2020, the uninsured rate is 8.9% (Pennsylvania Department of Health, Division of Health Informatics, 2022; March of Dimes, 2020).

1.2.2.3 Mental Health Related Maternal Mortality

Pennsylvania does not require reporting for substance use during pregnancy (Johnson, 2016). However, medical practices often still routinely drug test their pregnant patients based on outdated recommendations from the American College of Obstetricians and Gynecologists (ACOG) (McCabe, 2021). ACOG currently recommends screening “only with a patient’s consent and a positive test not be a deterrent to care, a disqualifier for coverage under publicly-funded

programs, or the sole factor in determining family separation (American College of Obstetricians and Gynecologists, 2023). Many pregnant people may hesitate to seek support for substance use during or after pregnancy for fear of criminal punishment. In order for Pennsylvania to make meaningful progress in preventing maternal mortality from accidental drug poisoning, the State must expand access to mental health care for pregnant and postpartum substance users and reinforce that screening for substances during pregnancy should only be done with consent and should not be used to criminalize pregnancy.

1.2.2.4 Social Determinants of Health

Social determinants of health also factor into the large percentage of adverse birth outcomes for Black residents in Allegheny County. Social determinants of health (SDOH), as defined by the World Health Organization, are nonmedical factors that influence health outcomes (World Health Organization, 2023). SDOH impacting pregnant and postpartum people in Allegheny County include income, environment, and racism.

In Pittsburgh, the racial disparity in maternal mortality is stark. Among Black pregnant people, approximately two deaths occur per 1,000 women whereas White women have less than one death per 1,000 women. According to a report from the Pittsburgh Gender Equity Commission, the mortality rate for Black women is higher than 97% of other comparable cities (Howell, Goodkind, Jacobs, Branson, & Miller, 2019). The report determines that inequality in prenatal care or managing health conditions is not a contributing factor for the racial disparities (Howell, Goodkind, Jacobs, Branson, & Miller, 2019). Social determinants of health cannot alone describe the disparities between Black and White maternal mortality rates in Pittsburgh. Racism, classism, and gender oppression contribute to health disparities systemically and implicitly (Crear-Perry, et al., 2021).

Low-income pregnant people are at a higher risk of maternal mortality. Approximately one third of all Allegheny County residents live in poverty, and this disproportionately affects Black women, who are five times more likely to experience poverty than White men (Howell, Goodkind, Jacobs, Branson, & Miller, 2019).

Another social determinant factor that particularly impacts pregnancy in Allegheny County is air quality and exposure to lead. Environmental factors are often studied and linked to adverse infant outcomes but data on how environmental factors impact maternal health is not ubiquitous. A recent study concludes that exposure to environmental toxicants, including air pollutants and lead, increases the risk of maternal mortality and morbidity, particularly for nonwhite women, who are disproportionately exposed to environmental toxicants (Boyles, et al., 2021). Specifically, air pollution is linked to ART failure, hypertensive disorders, uterine fibroids, subfertility, and miscarriage (Boyles, et al., 2021). In 2018, over one third of Black residents in Allegheny County surveyed noted that they consider air quality is a health risk for themselves and their families (Allegheny County Health Department, 2018). Additionally, exposure to lead is not only detrimental for infants and developing fetuses, it increases the risk of miscarriage. In Allegheny County, lead exposure is most prevalent in areas that are populated by majority Black residents (Allegheny County Health Department, 2018). Figure 1 below shows the percentage of Black residents in Allegheny County by census tract with the deeper red color indicating a higher percentage of Black residents. Figure 2 is also a census tract map which shows the environmental justice need scores in Allegheny County. Most of the overlap for the highest need for environmental justice overlaps with the areas of Allegheny County that have the highest percentage of Black residents.

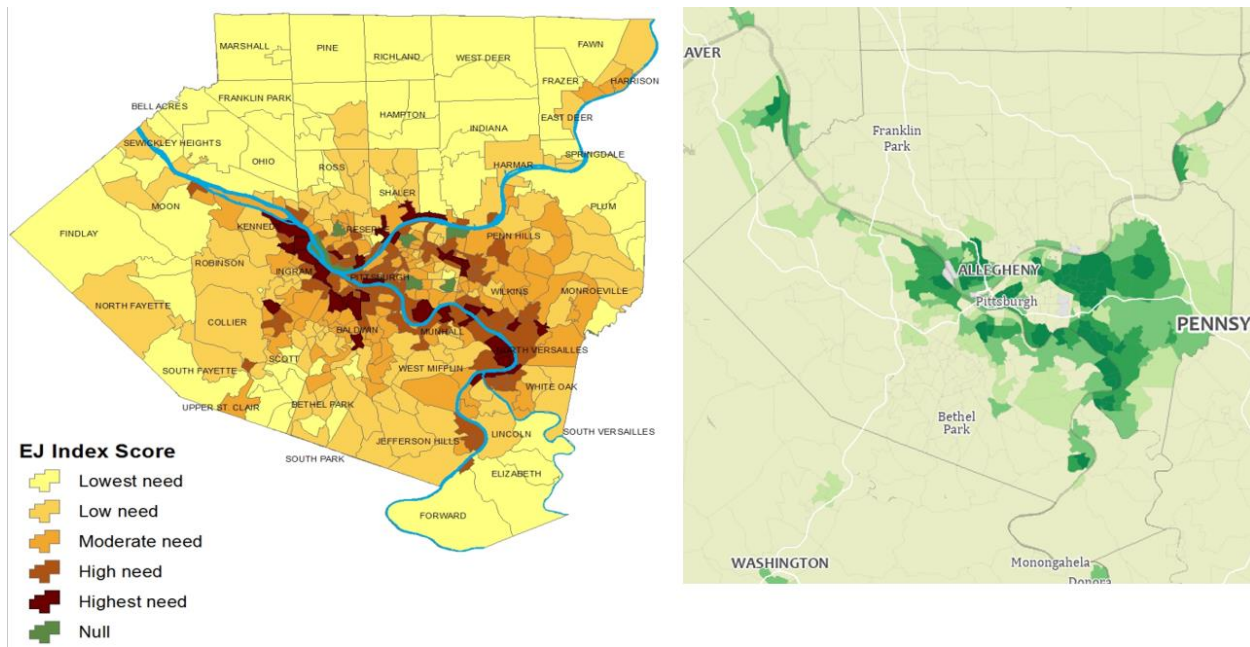


Figure 1. Allegheny County Environmental Justice Score (Allegheny County Health Department, 2018) and Census Tract Map of Allegheny County Black Residents (U.S. Census Bureau, 2020)

1.2.3 Current Interventions

Current programs exist in Pennsylvania to address pregnancy-associated deaths, including substance use disorder (SUD). One program, modeled after a CDC recommended program to improve health outcomes for mothers and babies, is the Pennsylvania Perinatal Quality Collaborative (PAPQC). Perinatal Quality Collaboratives (PQC) encourage collaborative learning, quick changes in policy/procedure, population-based improvements, and evaluation programs for participating providers. The CDC model of PQC focuses on reducing medical maternal mortality. The PAPQC, funded by the Pennsylvania Department of Drug and Alcohol Programs and the Henry L. Hillman Foundation, launched in 2019 to reduce maternal mortality and improve care for pregnant people and in 2022 expanded their focus to maternal substance use and substance-exposed newborns (Pennsylvania Perinatal Quality Collaborative, 2022). The PAPQC program

addresses Pennsylvania’s high percentage of nonmedical maternal mortality by putting substance use and maternal mental health at the forefront of their program model.

According to the SAMHSA database, there are currently 538 substance use service providers in Pennsylvania. Of the 538 facilities providing substance use treatment in Pennsylvania, 443 serve patients who receive their care through Medicaid. When filtering based on services offered to pregnant/postpartum women, that number decreases to 171, meaning only 31.8% of substance use treatment providers in Pennsylvania will work with pregnant or postpartum treatment seekers (Substance Abuse and Mental Health Services Administration, 2022). Of the 171 facilities who treat pregnant and postpartum people, 152 accept Medicaid. For Southwestern Pennsylvania, see the breakdown below with data from [FindTreatment.samhsa.gov/locator](https://findtreatment.samhsa.gov/locator).

Table 2. Substance Use Treatment Facilities in Southwestern Pennsylvania

County	# of substance use treatment facilities	# of facilities that accept Medicaid	# facilities who serve pregnant / postpartum people	# of facilities who serve pregnant/postpartum people and accept Medicaid
Allegheny	46	44	16	16
Armstrong	4	3	3	3
Beaver	6	5	1	1
Butler	7	7	2	2
Fayette	8	8	4	4
Greene	2	2	1	1
Indiana	4	4	2	2
Lawrence	4	4	2	2
Washington	14	13	6	6
Westmoreland	15	13	5	5

1.2.4 Considerations

Nationally and locally in Pennsylvania and Allegheny County, the state of maternal health is alarming. Pregnant people deserve safe, nonjudgmental, supportive care before, during, and after pregnancy. This includes expanding access to health care and centering those who are impacted the most by prenatal and pregnancy care and decisions in interventions and decisions around policies and programs. These programs may consider advocating for and establishing connections with midwifery practices that, historically, centered pregnant people during birth and, additionally, centered Black women and women of color as the primary attendants (Suarez, 2020). Evidence describes that birthing with a midwife can increase patient satisfaction, reduce medical intervention during childbirth, and improve maternal mortality, particularly for those at high risk (Katon, Enquobahrie, Jacobsen, & Zephyrin, 2021). In Pennsylvania and Allegheny County, a particularly alarming statistic is the number of maternal deaths related to accidental drug poisoning. National and local harm reduction interventions must include pregnant people and their care to meaningfully address maternal mortality.

According to the National Harm Reduction Coalition, harm reduction “is a set of practical strategies and ideas aimed at reducing negative consequences associated with drug use”. Harm reduction strategies incorporate methods of safer use and allowing people who use substances to set their own goals for use. Harm reduction is an important strategy in providing pathways to prevention, treatment, and recovery. Harm reduction is not solely useful for people who use substances and will be important in reducing overall maternal mortality in Pennsylvania (National Harm Reduction Coalition, 2020). Programs have previously implemented harm reduction principles to address public health problems including: sex work, eating disorders, tobacco use, and patient/provider care (Hawk, et al., 2017). While harm reduction is often viewed as an

individual intervention, where individuals are assessing their goals and needs, addressing harm reduction as a function of a systemic intervention is an important consideration in order to meaningfully reduce maternal mortality in Pennsylvania.

2.0 Review of Current Research on Reproductive Mental Health and Substance Use

This section describes clinical and community-based reproductive mental health services and interventions for reducing barriers to care and improving reproductive mental health. The goals of this review is to describe mental health interventions in both community-based and clinical models and to indicate whether the studies considered racism as a factor in their recommended interventions. Because reproductive mental health in the United States is also a structural issue, the review examines discussion of structural barriers to care and systemic interventions in the research.

2.1 Methodology

In December of 2022, a PubMed search was conducted of the public research and literature from 2017-2022, as reproductive mental health is an emerging topic in the field of reproductive health and maternal mortality. Concepts considered for the search included: intervention, pregnancy, community, and mental health. The figure below identifies concepts and sub-concepts that led to refined search terms.

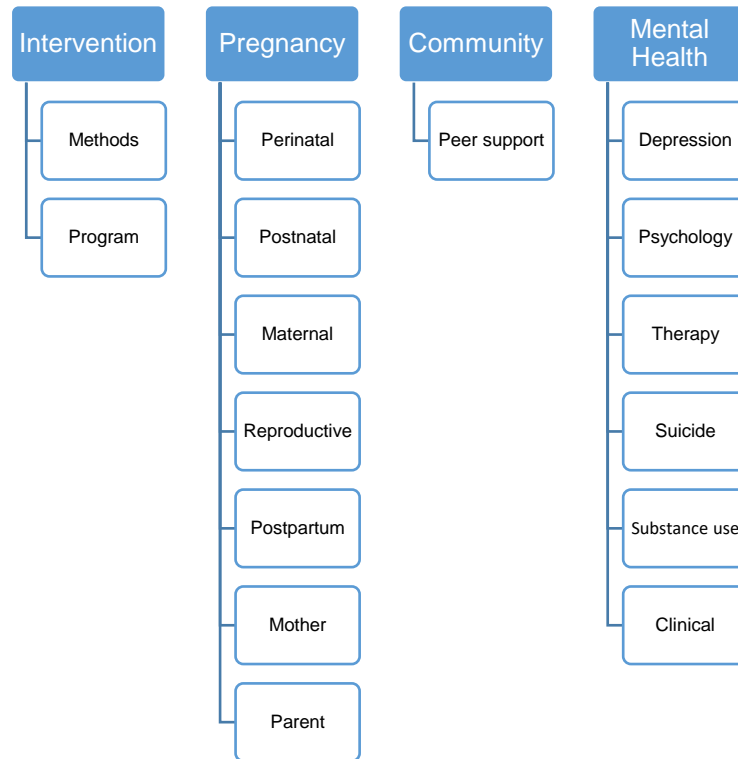


Figure 2. Literature Review Search Terms

Search terms included: “reproductive mental health care intervention” (2,807 results), “community based maternal therapy program” (921 results), “clinical community postpartum depression support” (213 results), “pregnancy peer support mental health” (190 results), “postpartum suicide” (254 results), “pregnancy related mental health death prevention” (78 results), “pregnancy substance use” (17 results) and “postpartum substance use” (2 results). A search string table and the list of references sorted by most recent publish date is provided in the appendix (Appendix A).

45 articles underwent title and abstract review. Inclusion for this review required maternal mental health as a main focus of the study with recommended interventions that address social determinants of health, including access to care. Studies that did not address racial and ethnic disparities and did not address social determinants of health were excluded from this review.

Additionally, studies that focused on infant mental health or infant loss were also excluded from this review. After studies were identified, they were categorized by the level of their described intervention methods, using the social-ecological model framework. Categories included: prevention; societal interventions (policy, systems, and structural interventions); community-based interventions, and relationship and individual interventions (including provider interventions). Relationship and individual interventions were combined in this review due to the interrelated nature of the recommended interventions that focused on provider/patient relationship and interpersonal relationships as opposed to individual personal interventions. Studies could be categorized on more than one level of the social ecological model if the interventions described in the study as the studies likely presented several interventions that crossed the socioecological framework. An additional review was completed to compare all studies that assess or described substance use disorder interventions.

2.2 Literature Review Results

Nineteen articles met inclusion criteria for this review (articles listed in Appendix B). Studies that met the inclusion criteria addressed maternal mental health, specifically mentioning depression and/or suicide. Several studies were excluded due to the focus on infant mental health. The studies included themes such as: maternal suicide, substance use, mental health (anxiety, depression), social determinants of health, and disparities/racism. Interventions described in these studies were categorized as: system level, community-based, and relationship/individual interventions.

Table 3. Literature Review Results—Included Studies

Title	Authors	Setting and Sample	Study Type	Key findings	Socioecological Lens	Themes	Publish Date
Initiatives to Reduce Maternal Mortality and Severe Maternal Morbidity in the United States : A Narrative Review	Ahn, R., Gonzalez, G. P., Anderson, B., Vladutiu, C. J., Fowler, E. R., & Manning, L	Not applicable / narrative review	Article Review	describes risk factors for maternal mortality and current U.S.-based interventions operating to reduce maternal mortality	System; Relationship/individual	Substance use, disparities/racism, mental health, social determinants of health	Dec-22
US Trends in Drug Overdose Mortality Among Pregnant and Postpartum Persons, 2017-2020	Bruzelius, E., & Martins, S. S.	n=7642 pregnancy-associated deaths between 2017-2022 from the National Vital Statistics System;	Retrospective Descriptive Study	1249 deaths related to overdose	System	Substance use	Dec-22
Universal Postpartum Naloxone Provision: A Harm Reduction Quality Improvement Project	Naliboff, J. A., & Tharpe, N.	n=197 postpartum people in a small rural hospital in Maine	Quasi-experimental Quality Improvement Project	Educating birthing unit staff and providers on implicit bias and harm reduction activities support universal postpartum overdose education and acceptance of a naloxone-containing home first aid kit.	Relationship/Individual	Substance use	Dec-22
Suicide and Maternal Mortality	Chin, K., Wendt, A., Bennett, I. M., & Bhat, A.	n=1995 PubMed results searching pregnancy and suicide	Literature Review	110 articles reviewed including case reports, original research, and reviews which address prevalence, risk factors, outcomes, prevention, and interventions for perinatal suicide	System; Relationship/individual	Suicide, substance use, social determinants of health, mental health	Apr-22

Title	Authors	Setting and Sample	Study Type	Key findings	Socioecological Lens	Themes	Publish Date
Reimagining Perinatal Mental Health: An Expansive Vision For Structural Change	Foster, V.-A., Harrison, J. M., Williams, C. R., Asiodu, I. V., Ayala, S., Getrouw- Moore, J., . . . Jackson, F. M.	Not applicable / article review	Article Review	Addressing perinatal mental health themes of people, systems, and structures	System	Social determinants of health, mental health, disparities/racism	Oct-21
A qualitative investigation of models of community mental health care for women with perinatal mental health problems	Lever Taylor, B., Kandiah, A., Johnson, S., Howard, L. M., & Morant, N.	n=36 women diagnosed with perinatal mental health difficulties who were supported in the community	Cross-sectional qualitative interviews	14 women accessed a multidisciplinary perinatal mental health team; 18 accessed a nonperinatal mental health team	Community	Mental health	Oct-21
Pathways To Equitable And Antiracist Maternal Mental Health Care: Insights From Black Women Stakeholders	Matthews, K., Morgan, I., Davis, K., Estriplet, T., Perez, S., & Crear-Perry, J. A.	n=10 Black women perinatal mental health stakeholders	Cross-sectional qualitative Interviews	5 key pathways identified to improve and expand access to equitable and antiracist maternal mental healthcare	System; Community	Mental health, substance use, social determinants of health disparities/racism	Oct-21
Addiction treatment in the postpartum period: an opportunity for evidence-based personalized medicine	Martin, C. E., & Parlier-Ahmad, A. B.	Not applicable / article review	Article Review	Evidence-based methods to improve personalized SUD models	Relationship/Individual	Suicide, substance use, mental health, social determinants of health, disparities/racism	Jul-21
Social and Structural Determinants of Health Inequities in Maternal Health	Crear-Perry, J., Correa-de- Araujo, R., Lewis Johnson, T., McLemore, M., Neilson, E., & Wallace, M.	n=5 essential activities for the integration of social needs into health care	Literature Review	Paid family leave, health insurance coverage and scope, respectful, cultural appropriate care, and investing in communities are existing policies and practices to address structural and SDOH	System; community	Social determinants of health, disparities/racism	Nov-20

Title	Authors	Setting and Sample	Study Type	Key findings	Socioecological Lens	Themes	Publish Date
Maternal mental health and reproductive outcomes: a scoping review of the current literature	Montagnoli, C., Zanconato, G., Cinelli, G., Tozzi, A. E., Bovo, C., Bortolus, R., & Ruggeri, S.	n=32 studies meeting the inclusion criteria (study type, availability of full text, humans as the subjects of the study, and English language publication	Literature Review	Describes the need for research addressing maternal mental health during the periconceptional period and first 1000 days of life	Relationship/Individual	Mental health, social determinants of health	Jul-20
Mobile Health for Perinatal Depression and Anxiety: Scoping Review	Hussain-Shamsy, N., Shah, A., Vigod, S. N., Zaheer, J., & Seto, E	n=26 publications reviewing mobile health as a reproductive mental health intervention	Literature Review	Describes mobile health apps and text-based interventions for anxiety and depression for prevention, screening, and treatment	Relationship/Individual	Mental health	Apr-20
Effect of a Community Agency-Administered Nurse Home Visitation Program on Program Use and Maternal and Infant Health Outcomes: A Randomized Clinical Trial	Dodge, K. A., Goodman, W. B., Bai, Y., O'Donnell, K., & Murphy, R.	n=436 County resident births at Duke University Hospital	Randomized Clinical Trial	Community-based Family Connects program achieved its goals of identifying family needs, responding to those needs with high parental satisfaction, and connecting families to community resources for major needs with a 44% lower investigation rate by CPS	Community	Mental health	Nov-19
Maternal Mortality in the United States: Updates on Trends, Causes, and Solutions	Collier, A.-r. Y., & Molina, R. L.	n=9 reports from 2018 Maternal Mortality Review Committees	Descriptive Study	Provides three key interventions to address maternal mortality in the United States	Relationship/Individual	Suicide, substance use, mental health, social determinants of health, disparities/racism	Oct-19

Title	Authors	Setting and Sample	Study Type	Key findings	Socioecological Lens	Themes	Publish Date
Maternal self-harm deaths: an unrecognized and preventable outcome	Mangla, K., Hoffman, M. C., Trumpff, C., O'Grady, S., & Monk, C.	Not identified	Descriptive Study	Identifies barriers to reporting, summarizes geographic specific data, addresses biases, and suggests recommendations to prevent maternal self-harm deaths	Relationship/Individual	Suicide, substance use, mental health	Oct-19
Perinatal depression care pathway for obstetric settings.	Byatt, N., Xu, W., Levin, L., & Moore Simas, T. A.	n=23 studies that met inclusion criteria limited to English language, adult women that were pregnant or within one year of delivery, integrated obstetric and depression care in an outpatient setting	Literature Review	Describes a perinatal depression care pathway as a framework to highlight intervention components for a comprehensive care model	System; Relationship/individual	Suicide, substance use, mental health	May-19
Interventions to Prevent Perinatal Depression: US Preventive Services Task Force Recommendation Statement(Review)	U.S. Preventive Services Task Force	n=50 studies that met inclusion criteria of English language, conducted in countries ranked as "very high" human development, and included pregnant persons or mothers up to a maximum of one year postpartum	Evidence Review	Counseling interventions, such as cognitive behavioral therapy and interpersonal therapy, are effective in preventing perinatal depression	Relationship/Individual	Mental health	Feb-19
Social support and maternal mental health at 4 months and 1 year postpartum: analysis from the All Our Families cohort	Hetherington, E., McDonald, S., Williamson, T., Patten, S. B., & Tough, S. C.	n=3057 participants from the All our Families longitudinal pregnancy cohort	Observational study	Low total support in pregnancy associated with increased risk of depressive symptoms and anxiety symptoms at 4 months.	Community	Mental health, social determinants of health	Jun-18

Title	Authors	Setting and Sample	Study Type	Key findings	Socioecological Lens	Themes	Publish Date
Implementation of an Evidenced-Based Parenting Program in a Community Mental Health Setting	Roosa Ordway, M., McMahon, T. J., De Las Heras Kuhn, L., & Suchman, N. E.	n=12 therapists from an urban community mental health clinic serving children and parents; n=17 mothers and their 0-84 month old children	Qualitative ethnographic	Importance of building community relationships, designing plans for training and supervision, use of interdisciplinary approaches	Community	Mental health	Dec-17
Associations of social support and stress with postpartum maternal mental health symptoms: Main effects, moderation, and mediation	Schwab-Reese, L. M., Schafer, E. J., & Ashida, S.	n=125 mothers from a large hospital in Iowa within 48 hours of having a live birth	Observational study	Stress and social support are related to maternal mental health	Relationship/Individual	Mental health, social determinants of health	Jul-17

2.2.1 Policy, Systems, and Structural Interventions

Eight of the 19 studies addressed societal interventions for reproductive mental health and maternal mortality. Systemic interventions suggested included establishing state-based maternal mortality review committees, improving and standardizing national and statewide data collection and systems, developing and implementing an integrated care model to address perinatal and postnatal depression and anxiety throughout and post pregnancy, and national funding for telehealth screening and teletherapy for maternal depression (Ahn, et al., 2019; Byatt, Xu, Levin, & Moore Simas, 2019; Chin, Wendt, Bennett, & Bhat, 2022; Collier & Molina, 2019; Crear-Perry, et al., 2021). The interventions acknowledge the postpartum period as the “fourth trimester” in order to extend access to care for pregnant people in a particularly vulnerable and under recognized period in their lives. Interventions recommended to address the “fourth trimester” at a systemic level included expanding Medicaid coverage beyond sixty days postpartum and including mental health care as a covered service (Foster, et al., 2021).

Five studies discussed addressing racism in maternal health and maternal mental health on a systemic level, addressing the medical system and providers, with interventions including: investing in a Black mental health workforce, educating and training the maternal health and mental health workforce in how structural and social determinants of health impact mental health and well-being (culturally-informed care), and adopting integrated care models with shared decision-making (Ahn, et al., 2019) (Byatt, Xu, Levin, & Moore Simas, 2019; Collier & Molina, 2019; Crear-Perry, et al., 2021; Foster, et al., 2021; Matthews, et al., 2021). Policy intervention recommendations from articles specifically addressing Black maternal health and maternal mental health included: providing universal paid leave, universal childcare, expanding access to health

care and Medicaid, and addressing environmental factors that determine health outcomes (Crear-Perry, et al., 2021; Foster, et al., 2021).

2.2.2 Community-Based Interventions

Eight studies out of 19 addressed community-based intervention for maternal mental health and mortality. Recommendation for community-based interventions include: community clinics in low income communities that provide specific programs for pregnant and perinatal people (including coverage for transportation and childcare), home visits by community nurse programs to connect new parents to community resources and assess post-birth mental health, providing community-based birthing support like doulas before, during, and after birth, increasing funding for community-based resources specializing in perinatal and postpartum mental health care, and integrating trusted community-based organizations to support pregnant people (Ahn, et al., 2019) (Collier & Molina, 2019; Crear-Perry, et al., 2021; Dodge, Goodman, Bai, O'Donnell, & Murphy, 2019; Hetherington, McDonald, Williamson, Patten, & Tough, 2018; Lever Taylor, Kandiah, Johnson, Howard, & Morant, 2021; Matthews, et al., 2021; Roosa Ordway, McMahon, De Las Heras Kuhn, & Suchman, 2018).

Of the eight studies that addressed community-based intervention for maternal mental health and mortality, three specifically acknowledged the importance of community-based interventions for Black parents. Recommendations for addressing Black maternal mental health and mortality at a community level described in these studies included: investing in Black women-led community-based organizations, increasing the number of Black community-based mental health practitioners, and integrating community practices in the birthing process (Collier & Molina, 2019; Crear-Perry, et al., 2021; Matthews, et al., 2021).

2.2.3 Relationship/Individual Interventions

Ten studies out of 19 discussed relationship or individual-based interventions, which includes provider-based interventions and studies that addressed substance use during pregnancy or the postpartum period. Recommendations for interventions on the relationship or individual level included: personalized mental health and substance use treatments, provider-education on maternal mental health and substance use, individual mobile/text-based mental health interventions, increased patient-advocacy and awareness of mental health concerns, particularly for pregnant and postpartum people with a history of mental health concerns, provider-adoption of universal screening for mental health concerns during and post pregnancy, and individual pharmacotherapy (Ahn, et al., 2019; Byatt, Xu, Levin, & Moore Simas, 2019; Chin, Wendt, Bennett, & Bhat, 2022; Hussain-Shamsy, Shah, Vigod, Zaheer, & Seto, 2020; Mangla, Hoffman, Trumpff, O'Grady, & Monk, 2019; Martin & Parlier-Ahmad, 2021; Montagnoli, et al., 2020; Naliboff & Tharpe, 2022; Schwab-Reese, Schafer, & Ashida, 2017; U.S. Preventive Services Task Force, 2019).

One study out of 19 discussed addressing interventions at the relationship or individual level specifically for Black pregnant and postpartum people. This study reviewed a peer-to-peer education program on racial disparities on maternal mortality. Peers who trained in this program ultimately formed subcommittees in their institutions to address the social determinants of maternal mortality (Ahn, et al., 2019).

2.2.4 Substance Use and Accidental Drug Poisoning

Of the 19 studies, nine discuss substance use in relation to maternal mental health and mortality. These studies discuss risk factors for accidental drug poisoning and interventions to

address both maternal mental health and suicide risk and substance use. Recommended interventions described in these studies included: wraparound screening for both mental health and substance use during each postpartum visit, increasing access to public funding for interventions for substance users during and post pregnancy, expanding treatment options (like teletherapy and wrap-around models) for substance use disorder, and direct resource distribution to pregnant and postpartum women by community service agencies (Ahn, et al., 2019; Bruzelius & Martins, 2022; Byatt, Xu, Levin, & Moore Simas, 2019; Chin, Wendt, Bennett, & Bhat, 2022; Collier & Molina, 2019; Mangla, Hoffman, Trumpff, O'Grady, & Monk, 2019; Martin & Parlier-Ahmad, 2021; Matthews, et al., 2021; Naliboff & Tharpe, 2022).

Five of the nine studies discuss the criminalization and stigma of substance use during pregnancy and postpartum as a barrier to treatment. These articles discuss discrimination during pregnancy and birth, particularly prominent for Black or Hispanic and uninsured pregnant people, the impact of substance use criminalization on treatment and disclosure, the importance of community-based and trusted providers and anti-bias education. (Collier & Molina, 2019; Mangla, Hoffman, Trumpff, O'Grady, & Monk, 2019; Martin & Parlier-Ahmad, 2021; Matthews, et al., 2021; Naliboff & Tharpe, 2022).

2.2.5 Discussion

The 19 studies identified in this review, including five literature reviews, examined maternal suicide, drug overdose, depression, social determinants of health, and many studies described interventions to address these health issues. Categorizing these interventions at the levels of the socio ecological model demonstrates that individual and relationship (or provider-based) interventions, cross-cutting interventions should be implemented to address nonmedical maternal mortality. The literature review also demonstrates that, in addition to the need to continue

addressing medical factors that contribute to maternal death, there is a need to prioritize nonmedical maternal mortality, which is increasing precipitously year over year. Additionally, focusing on addressing Black maternal mortality with interventions that address all levels of the socio-ecological framework can decrease maternal mortality rates for not only Black birthing people, but all birthing people in the United States.

Based on the prevalence of substance use in suicide for pregnant and postpartum people, it is critical to consider universal verbal screening for both substance use and mental health concerns during prenatal and postpartum visits and ensuring that wraparound care for substance use and mental health is obtainable during those visits if required. It is also important to acknowledge the burden of criminalization of substance use during pregnancy as a barrier to treatment. When prenatal and postpartum care requires drug testing screens for illicit substances (and not those prescribed to a patient) with the threat of incarceration or being referred to the criminal justice system, new parents will understandably be wary of the medical system and will decline care. This is particularly true for Black women who make up 30% of the prison population, while only holding 13% of the overall population. Two thirds of incarcerated women are also mothers and the majority of incarcerated women are charged with drug or property crimes (Kravitz, et al., 2021).

3.0 Presenting Interventions and Recommendations

Following the literature review, this essay examines recent policy and programmatic interventions to support reproductive mental health at the Federal, State, and Local level. Highlighted interventions on the national and state level are presented through a socioecological framework. Interventions on the local level are addressed through programmatic recommendations for Forward Allies to expand their reach to mental health care providers and pregnant people in Southwestern Pennsylvania.

3.1 National Interventions

3.1.1 Reviewing the Substance Use Disorder Treatment During Pregnancy Actions Report

In October 2022, the Biden Administration (Administration) released a report and actionable steps on “Substance Use Disorder Treatment During Pregnancy” to improve access to care and save lives for pregnant people who use substances. The report acknowledges provider bias as a major factor in barriers to care for pregnant people who use substances. Providers were much less likely to accept pregnant patients for opioid use disorder (OUD) treatment than patients who did not present as pregnant. Provider bias for treating pregnant patients with OUD compounds for patients of color, rural patients, and patients who do not speak English. In an effort to reduce overdose deaths for pregnant people, the report outlines several action items that the Administration will implement to improve access to effective treatment (White House Office of National Drug Control Policy, 2022).

The nine actionable steps presented in this report also can be categorized using the socioecological framework.

The first set of actions addresses societal interventions and includes: expanding publicly available data on pregnant and postpartum SUD across the United States; expanding access to medication for OUD in Tribal communities and Tribal nations for pregnant women and women of reproductive age; appointing an Associate Administrator for Women’s Services in SAMHSA to focus on pregnancy and the postpartum period and review and implement federal programs that serve pregnant women, and improving maternal mental health outcomes for pregnant, lactating, and postpartum people with SUD. The second set of actions addresses community interventions and includes: developing a training for the audience of grantee recipients from the Department of Justice’s Office of Juvenile Programs (OJJDP), Family Treatment Court Program, and the Department of Health and Human Services’ Substance Abuse and Mental Health Administration’s drug treatment course programs (SAMHSA); strengthening relationships between hospitals and community-based organizations and pregnant and postpartum people by providing grants to strengthen support for SUD; and providing support for neonatal abstinence syndrome (NAS) in rural communities. The third set of actions addresses relationship/individual interventions and includes: Substance Use Disorder education for women’s primary health care providers at the Veterans Health Administration (VA) and developing national certification standards for peer recovery support specialists to formalize peer support as a treatment option (White House Office of National Drug Control Policy, 2022).

3.1.1.1 Societal Level Actions: Expanding Data, Expanding Access, and Expanding

Awareness

Expanding and enhancing data on providers who are waived to dispense buprenorphine and provide other SUD treatment services will identify providers who can provide treatment and inform of the benefits of substance disorder treatment for pregnant and postpartum women. With the data, the Administration will release a report intended as a call to action for providers to treat pregnant and postpartum women with SUD (White House Office of National Drug Control Policy, 2022). An important policy change implemented on January 12th, 2023 in Section 1262 of the Consolidated Appropriations Act, 2023 “removes the federal requirement for practitioners to submit a Notice of Intent (have a waiver) to prescribe medications like buprenorphine for the treatment of opioid use disorder” (Substance Abuse and Mental Health Services Administration, 2023). This new procedure will allow “all practitioners who have a current DEA registration that includes Schedule III authority” to prescribe buprenorphine (Substance Abuse and Mental Health Services Administration, 2023). This removes a heavy burden on providers who, prior to rescinding this policy, wanted to prescribe buprenorphine were required to fill out onerous paperwork and take additional training to care for their patients who wanted to access substance use treatment. Expanding the pool of providers who can prescribe buprenorphine and expanding access to treatment is an important step for appropriately addressing the severity of the opioid crisis in the United States. This will also expand the data pool on SUD treatment for pregnant and postpartum women in the United States, which will hopefully reassure and encourage providers to provide this safe treatment to their pregnant and postpartum patients.

The Administration plans to expand access to medication for OUD in Tribal communities and Tribal nations for pregnant women and women of reproductive age by expanding the Indian Health Service (IHS) Opioid prescribing dashboard to include buprenorphine and other additional

SUD treatment options, requiring IHS employees, contractors, students, and volunteers to complete an IHS developed training module on trauma-informed care, and encouraging OUD screening and referral by developing additional training modules and implementing Clinical Reporting Systems that track screening, interviews, and referral to treatment for pregnant patients and women (White House Office of National Drug Control Policy, 2022). According to a SAMHSA Data Review addressing substance use in U.S.-Born American Indians or Alaska Natives, 13.7% of respondents reported needing substance use treatment and only 1.9% received it (Park-Lee, et al., 2018). The removal of the x-waiver requirement will increase accessibility to substance use treatment in tribal communities.

The report also recommends appointing an Associate Administrator for Women's Services in SAMHSA to focus on pregnancy and the postpartum period and review and implement federal programs that serve pregnant women, like Medicaid, to incorporate mental health and SUD and treatment (White House Office of National Drug Control Policy, 2022). Medicaid covers half of all United States births and is the largest payer for mental health services. Additionally, Medicaid provides coverage for SUD treatment and 12% of Medicaid beneficiaries over the age of 18 have SUD (Centers for Medicare & Medicaid Services, 2022). Ensuring that birthing people are aware of Medicaid's coverage of mental health services and connecting pregnant people to mental health services can prevent maternal mortality.

The report also addresses improving maternal mental health outcomes for pregnant, lactating, and postpartum people with SUD. The report suggests using the FY 2022-23 budget to address social determinants of health, which may include this population. The report does not include suggested interventions, actions, or specified line items to where the budgeted money may be spent. Possible interventions to address perinatal mental health could include: direct support for

new parents and implementing universal screening and diagnosis for maternal mental health and SUD concerns.

3.1.1.2 Community Level Actions: Grantee Training, Hospital and Community-Based

Organization Partnerships, and Rural Community Support

The first recommended community level action is to develop a training for the audience of grantee recipients from the Department of Justice's Office of Juvenile Programs (OJJDP), Family Treatment Court Program, and the Department of Health and Human Services' Substance Abuse and Mental Health Administration's drug treatment course programs (SAMHSA). The training supports the use of medication for substance use within these programs and works with key stakeholders to develop the program. The training will commence in 2023/2024 for recipients of the grant (White House Office of National Drug Control Policy, 2022). In 2021, OJJDP awarded 16 grants for the family drug court program and the family-based alternative sentencing program, combined, with zero grants awarded to Pennsylvania (U.S. Department of Justice Office of Justice Programs, 2021). As of 2020, Pennsylvania ranks number 10 in the nation for accidental drug poisonings (Centers for Disease Control and Prevention, 2020) . Based on this action from the White House and the eligible categories for input, Pennsylvania drug court programs will have zero input in how this training will operate and how to reach those most impacted, leaving out one of the states with the direst death rates for accidental drug poisoning.

Another recommendation supports strengthening relationships between hospitals and community-based organizations and pregnant and postpartum people by providing grants to strengthen support for SUD. The grant stipulations will require educating participants with SUD on biological, emotional, and psychosocial milestones during and after pregnancy for indications or stressors that may increase the risk for drug use or overdose (White House Office of National

Drug Control Policy, 2022). The Administration does not enumerate best practices or recommended interventions for strengthening these support structures within the report.

The Administration recommends improving systems of care, family supports, and addressing social determinants of health by awarding 40 CBOs a total of \$20 million to Rural Communities Opioid Response program under the Health Resources and Services Administration (White House Office of National Drug Control Policy, 2022). The incidence of NAS and SUD is increasing across the United States, particularly in rural communities. According to a study of hospital discharge data from 2007-2014, approximately 8.9% of rural residents who gave birth in urban teaching hospitals recorded as having SUD and indicated a similar pattern for NAS. The numbers for OUD and NAS increased rapidly in rural counties from 1.2 to 7.5 per 1,000 compared to urban communities which saw a rise of 1.4 to 4.5 per 1,000 indicating a higher burden on the already strained rural health care system (Kozhimannil, Chantarat, Ecklund, Henning-Smith, & Jones, 2018).

3.1.1.3 Relationship/Individual Level Actions: Provider Training and Peer Support

Standardization

The recommendation of offering substance use disorder (SUD) education to at the Veterans Health Administration (VA) intends to improve identification and diagnosis of OUD and will expand access to SUD treatments. Additionally, the VA will develop a pilot program that includes a collaborative treatment model for SUD. The program will pilot at four VA sites and is expected to include approximately 900 veterans who identify as women (White House Office of National Drug Control Policy, 2022). The VA currently provides healthcare for 2 million women, trans, and nonbinary veterans. Educating providers and expanding treatment for veterans and particularly veterans who identify as women is an important intervention for the veteran community,

approximately one in ten of whom are diagnosed with SUD (Teeters, Lancaster, Brown, & Black, 2017).

The Administration also recommends developing national certification standards for peer recovery support specialists. The goal is to expand adoption, recognition, payment, and integration of peer support models of care to the health care system (White House Office of National Drug Control Policy, 2022). Focusing on health care systems, the Administration is leaving behind millions of people who cannot access care, or do not trust the health care system. Additionally, placing larger burdens on certifying peer support specialists may be a barrier to peer support.

While these actions are prescient and necessary to support pregnant people who use substances, these plans require additional detail and evaluation support to measure outcomes and implementation. For example, in developing training to support the use of medication for substance use within SAMHSA programs, what are the outcomes and how will they be measured? Will the training be measured on how many programs successfully adopt medication for substance use, or on how many programs successfully complete the training?

3.2 Pennsylvania State Interventions

The Pennsylvania Maternal Mortality Review Committee (MMRC) report addresses interventions to reduce maternal mortality in Pennsylvania. Although some of these recommendations require federal support, most of these actions may be addressed at the level of the State of Pennsylvania.

3.2.1 State/System Actions

The MMRC recommends building infrastructure to support pregnant and postpartum people in Pennsylvania including, as mentioned above: expanding Medicaid eligibility for up to one year postpartum (at minimum); addressing privacy laws that interfere with care coordination between physicians and mental health providers; increasing public education and awareness of mental health during pregnancy and postpartum to decrease stigma; and expanding referrals for pregnant and postpartum patients with mental health concerns. Expanding referrals and increasing the capacity for care in the mental health space includes providing training, implementing universal screenings and developing guidelines on frequency and timing of screenings for mental health conditions for pregnant and postpartum people, and increasing the mental health provider workforce, including training providers in reproductive mental health care and reproductive trauma. (Pennsylvania Bureau of Family Health, 2022)

For pregnant and postpartum people who use substances, the MMRC recommends addressing laws around substance use disorder treatment to allow providers to communicate and provide continuity of care, decriminalize substance use for pregnant people, promote substance use and mental health treatment for pregnant people, and increase education on substance use disorder to decrease stigmatization.

3.2.2 Community Level Actions

On the community level, the MMRC recommends involving community-based organizations (CBOs) in prevention by increasing knowledge of social supports available within communities and expanding the capacity to get pregnant and postpartum community members to their medical appointments (Pennsylvania Bureau of Family Health, 2022).

3.2.3 Provider Relationship/Individual Actions

For providers and systems, the MMRC recommends that providers refer pregnant and postpartum patients with substance use concerns for treatment, provider training and education on substance use in pregnant and postpartum patients, implementation of universal screenings and the development of guidelines on frequency and timing of screenings for substance use, and increasing the workforce of substance use treatment providers, including training providers on substance use during pregnancy and reproductive trauma (Pennsylvania Bureau of Family Health, 2022).

4.0 Local Interventions in Southwestern Pennsylvania through Forward Allies and Equity in Mental and Reproductive Health

As described in the Introduction section, Forward Allies for Equity in Mental and Reproductive Health (Forward Allies), is a nonprofit based in Pittsburgh supporting equitable access to mental and reproductive healthcare. Forward Allies provides training for mental health providers on reproductive mental health, trauma-informed care, and anti-bias work. Additionally, Forward Allies engages in policy advocacy around pro-abortion legislation, parental leave policies, single-payer healthcare, and policies that reduce maternal morbidity and mortality rates on a national scale. Forward Allies also provides a mental health fund for families to access who cannot afford to pay for reproductive mental health care and aims to reduce barriers for families to those appointments by providing childcare and transportation stipends.

Drawing upon the literature review and policy scan results, this paper recommends programs and initiatives for Forward Allies to consider in its work to reduce maternal mortality and morbidity and increase equitable access to mental and reproductive healthcare. This section will also take into consideration the issue of substance use related to maternal mortality and how to advocate for the inclusion of substance use and substance use interventions to address maternal mortality and reproductive mental health.

Forward Allies' goal is to improve maternal mental health care by reducing barriers to care (including costs) and increasing access to existing programs. Forward Allies currently offers 12 sessions of mental health therapy at no cost for therapy related to reproductive health, and includes a stipend for childcare and transportation to and from appointments. In 2022, Forward Allies supported five families in Southwestern Pennsylvania. An awareness building campaign may

support increased funding and public awareness of the Forward Allies Mental Health Fund program.

Implementing an awareness building campaign will require assessing who the target audience is and how to reach that audience in the most cost-effective way. Based on Forward Allies' model, there are three target audiences with distinct messaging: providers, patients, and community-based organizations. For providers, Forward Allies goal is to make providers aware of the trainings and the mental health fund. Providers, in this instance, are birth workers who see pregnant and postpartum patients. Forward Allies may consider developing a "two-in-one" campaign for provider awareness of trainings offered by the organization and also for providers to refer patients to their services. Forward Allies should consider reaching providers from UPMC Magee's OB/GYN and midwifery programs, Allegheny Health Network's Pregnancy and newborn care services, and Federally Qualified Health Centers (FQHC) in the Pittsburgh area. Pennsylvania has several FQHC Programs which are health centers or clinics who focus on serving patients who are uninsured, underinsured, and underserved. According to the Health Resources and Services Administration's FQHC locator, there are 21 clinics in Pittsburgh (Health Resources and Services Administration, 2023). By bringing an awareness campaign to providers and patients at FQHCs in Allegheny County, Forward Allies can reach underserved communities to offer mental health, transportation, and childcare support at zero cost for twelve sessions. Forward Allies can also offer the trainings at a discount for providers who specifically serve low-resourced communities or who operate with expanded access to Medicaid.

Partnering with providers to increase access to training will also encourage providers to make referrals for their patients to the Mental Health Fund. Expanding awareness of the Mental Health Fund in a provider setting by not only increasing awareness among providers, but also providing a direct resource flyer for Forward Allies in medical offices will increase awareness of

the program among potential clients and referrals. Additionally, Forward Allies may want to consider engaging patients in their communities by putting up fliers in neighborhood and community gathering places like libraries, bus stops, day cares, and other community centers. Including a QR code on the flyer with tracking capability will help Forward Allies quantify where the web traffic and referrals originate.

Forward Allies is in a capacity-building phase of developing relationships with CBOs in Pittsburgh who support reproductive health care and women's services in southwestern Pennsylvania. Strengthening those relationships and returning value by providing access for clients to the Mental Health Fund is another way to gain awareness of Forward Allies and their mission. Some organizations to consider for partnerships are Healthy Start's Moving Beyond Depression program, the Allegheny County Health Department, Planned Parenthood of Western Pennsylvania, the Pittsburgh Bereavement Doula, Brown Mamas, the Birthing Hut, the Council of Three Rivers American Indian Center, and Casa San Jose. By building relationships and trust with community-led organizations, Forward Allies can increase their reach and impact, particularly opening the door to discuss the link between mental health and maternal health. This campaign should include more than introductions and awareness raising—it should include uplifting and providing a mutually beneficial partnership to support organizations doing on the ground work in the Pittsburgh area. Forward Allies can support these organizations by offering discounts on group registration for trainings to organizations with a budget under a set dollar amount. Many of the organizations listed above either are birthworkers, work closely with birthworkers, or work in a space with parenting and child care programs.

Expanding training for providers on reproductive mental health and direct support for people seeking mental health support in Pittsburgh is one additional way that Forward Allies can contribute to reducing the maternal mortality crisis. Developing an awareness building campaign

that involves reaching providers, potential clients, and integrates CBOs into the plan will strengthen Forward Allies' reputation and provide additional avenues of support for the Mental Health Fund.

One recommendation that may fit with Forward Allies' model of care delivery supports a pilot model for pregnant and postpartum parents who are experiencing symptoms of anxiety or depression by implementing pop up peer support models to support reproductive mental health. This model would act as a community-based care model and could partner with harm reduction organizations in Pittsburgh like Prevention Point and Bridge Outreach to support people who use substances during pregnancy and the postpartum period. Proposing a model like this would reduce some barriers to care, like cost, for mental health support during this critical period. This model could work as a stand-alone pop up peer support group or model, or could work as a text-based support line. A text-based support line would not only remove costly barriers to care, but also would work in a less structured format as opposed to a more formal peer support model and could work to address continuity of care issues.

A model like this could also connect pregnant people experiencing reproductive mental health needs with Forward Allies' referral and Mental Health Fund programs. According to one review, a gap in the provision of mobile health (mhealth) and reproductive mental health care was referrals or support from active psychological therapies (Hussain-Shamsy, Shah, Vigod, Zaheer, & Seto, 2020). Including a linkage to Forward Allies' referral would bridge the existing gap and could support barriers to care faced by potential clients who may want to access mental health support but are unaware of the Mental Health Fund, childcare, and transportation support offered by Forward Allies.

One additional way to include harm reduction for substance use and reproductive mental health through Forward Allies' model is to encourage providers who work with Forward Allies'

Mental Health Fund to have naloxone available for their clients. Naloxone is an opioid-overdose reversal drug that reverses the effects of opioids on the brain and respiratory system to prevent death (National Library of Medicine, 2019). Because of Pennsylvania's standing order on naloxone provision, CBOs in Pittsburgh can provide naloxone in person or by mail (Pennsylvania Department of Health, 2023). By having naloxone available for clients and patients, it can reduce stigma for opioid use and provide resources for preventing accidental drug poisoning.

Forward Allies has a strong opportunity to prevent nonmedical maternal deaths in Pittsburgh by expanding support for reproductive mental health care and substance use. Partnering with organizations who are trusted in the community and work with new and expectant parents, Forward Allies can increase awareness of the Mental Health Fund and their services to reduce barriers to mental health care. Additionally, working with health care providers to expand access to the reproductive mental health training may increase awareness of systemic racism in the medical establishment and may provide opportunities for providers to interrupt their own biases during care and treatment for pregnant and postpartum people. Continuing to advocate for policies both locally and nationally that support pregnant and postpartum parents like paid family leave, coverage for mental health care, expanded Medicaid, and protected and expanded access to abortion fits squarely within Forward Allies' remit of supporting equitable access to mental and reproductive healthcare and raising awareness of and preventing reproductive loss due to suicide.

5.0 Conclusion

Maternal mortality in the United States is a crisis and preventative mental health interventions must be applied at a societal, community, and individual level to reduce the number of maternal deaths. Addressing structural barriers to care is an important step at both the federal and state level to reduce death. Interventions addressing those barriers include: expanding access to care; ensuring that care is racially informed nonbiased and safe for pregnant people; addressing social determinants of health that impact care like accessing safe housing and safe environments; and expanding paid family leave among many other policy needs to safeguard pregnant people.

The hesitancy to include and acknowledge maternal mental health and substance use when discussing maternal death at a national level is detrimental to addressing the problem. Focusing on the causes of medical deaths, as opposed to nonmedical causes of death, ignores the real risks presented by mental health issues and substance use during pregnancy and postpartum period. This avoidance further stigmatizes pregnant and postpartum people who experience mental health emergencies and substance use. Destigmatizing reproductive mental health issues by talking about the difficulties of new parenting, the changes new parents go through, and increasing awareness of the signs and symptoms of postpartum depression and anxiety can lead to a decrease in maternal mental health crises. Destigmatizing substance use during pregnancy and postpartum by including harm reduction strategies in an integrated and wraparound care model can prevent maternal death by accidental drug poisoning.

In Pennsylvania and Allegheny County in particular, it is imperative to address the increasing rate of maternal mortality caused by accidental drug poisoning. Exploring the causes of substance use and implementing solutions for substance use by expanding access to nonjudgmental mental health care, including harm reduction strategies, is important to acknowledging and acting

against accidental drug poisoning as the number one contribution to maternal death in the state. Substance use is not a new issue in the state of Pennsylvania and the surrounding states, however, substance use treatment and harm reduction strategies often leave out pregnant and postpartum people. Peer support and increasing access to mental health care and support and access to naloxone to prevent overdose may contribute to decreasing maternal death due to overdose.

Investing in community-building and mending gaps between social support services in Pittsburgh and Allegheny County may also support reducing maternal deaths. Assessing the impact of programs like Forward Allies' Mental Health Fund which reduces barriers to care by providing no-cost mental health sessions and transportation and childcare stipends can positively impact continuity of care for reproductive mental health and expand programs that address structural and systemic issues for access to care.

Appendix A

Table 4. Literature Review String

Search number	Query	Search Details	Results
1	Reproductive mental health care intervention	("reproduction"[MeSH Terms] OR "reproduction"[All Fields] OR "reproductions"[All Fields] OR "reproductive"[All Fields] OR "reproductively"[All Fields] OR "reproductives"[All Fields] OR "reproductivity"[All Fields]) AND ("ment health care"[Journal] OR ("mental"[All Fields] AND "health"[All Fields] AND "care"[All Fields]) OR "mental health care"[All Fields]) AND ("intervention s"[All Fields] OR "interventions"[All Fields] OR "interventive"[All Fields] OR "methods"[MeSH Terms] OR "methods"[All Fields] OR "intervention"[All Fields] OR "interventional"[All Fields]) AND (2017:2022[mdat])	2,807
2	Clinical community postpartum depression support	((("ambulatory care facilities"[MeSH Terms] OR ("ambulatory"[All Fields] AND "care"[All Fields] AND "facilities"[All Fields]) OR "ambulatory care facilities"[All Fields] OR "clinic"[All Fields] OR "clinics"[All Fields] OR "clinical"[All Fields] OR "clinically"[All Fields] OR "clinicals"[All Fields] OR "clinics"[All Fields]) AND ("communal"[All Fields] OR "communalism"[All Fields] OR "communalities"[All Fields] OR "communality"[All Fields] OR "communally"[All Fields] OR "commune"[All Fields] OR "communes"[All Fields] OR "community s"[All Fields] OR "communitys"[All Fields] OR "residence characteristics"[MeSH Terms] OR ("residence"[All Fields] AND "characteristics"[All Fields]) OR "residence characteristics"[All Fields] OR "communities"[All Fields] OR "community"[All Fields]) AND ("depression, postpartum"[MeSH Terms] OR ("depression"[All Fields] AND "postpartum"[All Fields]) OR "postpartum depression"[All Fields] OR ("postpartum"[All Fields] AND "depression"[All Fields])) AND ("support"[All Fields] OR "support s"[All Fields] OR "supported"[All Fields] OR "supporter"[All Fields] OR "supporter s"[All Fields] OR "supporters"[All Fields] OR "supporting"[All Fields] OR "supportive"[All Fields] OR "supportiveness"[All Fields] OR "supports"[All Fields]) AND ("supportiveness"[All Fields] OR "supports"[All Fields])) AND (2017:2022[mdat])	213
3	pregnancy peer support mental health	((("pregnancy"[MeSH Terms] OR "pregnancy"[All Fields] OR "pregnancies"[All Fields] OR "pregnancy s"[All Fields]) AND "peer"[All Fields] AND ("support"[All Fields] OR "support s"[All Fields] OR "supported"[All Fields] OR "supporter"[All Fields] OR "supporter s"[All Fields] OR "supporters"[All Fields] OR "supporting"[All Fields] OR "supportive"[All Fields] OR "supportiveness"[All Fields] OR "supports"[All Fields]) AND ("mental health"[MeSH Terms] OR ("mental"[All Fields] AND "health"[All Fields]) OR "mental health"[All Fields])) AND (2017:2022[mdat])	190
4	Postpartum suicide	((("postpartum period"[MeSH Terms] OR ("postpartum"[All Fields] AND "period"[All Fields]) OR "postpartum period"[All Fields] OR "postpartum"[All Fields]) AND ("suicid"[All Fields] OR "suicidal ideation"[MeSH Terms] OR ("suicidal"[All Fields] AND "ideation"[All Fields]) OR "suicidal ideation"[All Fields] OR "suicidality"[All Fields] OR "suicidal"[All Fields] OR "suicidally"[All Fields] OR "suicidals"[All Fields] OR "suicide"[MeSH Terms] OR "suicide"[All Fields] OR "suicides"[All Fields] OR "suicide s"[All Fields] OR "suicided"[All Fields] OR "suicides"[All Fields])) AND (2017:2022[mdat])	254
5	Pregnancy related mental health death prevention	((("pregnancy"[MeSH Terms] OR "pregnancy"[All Fields] OR "pregnancies"[All Fields] OR "pregnancy s"[All Fields]) AND ("family"[MeSH Terms] OR "family"[All Fields] OR "relation"[All Fields] OR "relatability"[All Fields] OR "relatable"[All Fields] OR	78

		"related"[All Fields] OR "relates"[All Fields] OR "relating"[All Fields] OR "relational"[All Fields] OR "relations"[All Fields]) AND ("mental health"[MeSH Terms] OR ("mental"[All Fields] AND "health"[All Fields]) OR "mental health"[All Fields]) AND ("death"[MeSH Terms] OR "death"[All Fields] OR "deaths"[All Fields]) AND ("prevent"[All Fields] OR "preventability"[All Fields] OR "preventable"[All Fields] OR "preventative"[All Fields] OR "preventatively"[All Fields] OR "preventatives"[All Fields] OR "prevented"[All Fields] OR "preventing"[All Fields] OR "prevention and control"[MeSH Subheading] OR ("prevention"[All Fields] AND "control"[All Fields]) OR "prevention and control"[All Fields] OR "prevention"[All Fields] OR "preventions"[All Fields] OR "preventive"[All Fields] OR "preventively"[All Fields] OR "preventives"[All Fields] OR "prevents"[All Fields])) AND (2017:2022[pdat])	
6	"Pregnancy substance use"	("pregnancy substance use"[All Fields]) AND (2017:2022[pdat])	17
7	"Postpartum substance use"	("postpartum substance use"[All Fields]) AND (2017:2022[pdat])	2

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