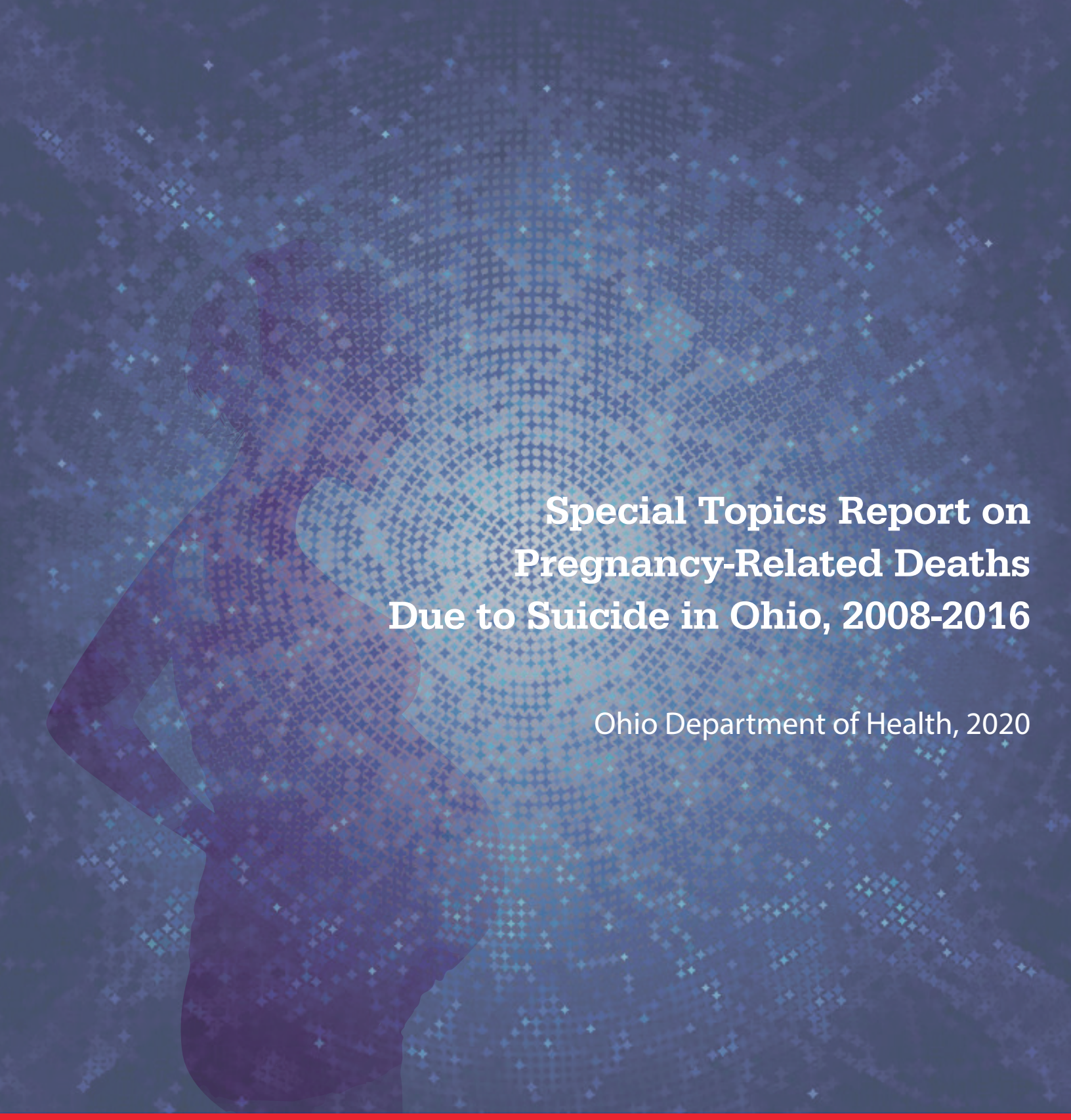


Special Topics Report on Pregnancy-Related Deaths Due to Suicide in Ohio, 2008-2016

Ohio Department of Health, 2020

Ohio | Department of Health

Table of Contents

Overview

The Ohio Department of Health (ODH) established the Ohio Pregnancy-Associated Mortality Review (PAMR) program to identify and review pregnancy-associated deaths with the goal of developing interventions to reduce maternal mortality, particularly for pregnancy-related deaths.

A pregnancy-related death is the death of a woman while pregnant or within one year of pregnancy from any cause related to or aggravated by the pregnancy or the management, excluding accidental or incidental causes. A pregnancy-associated death is broader and includes the death of a woman while pregnant or anytime within one year of pregnancy, regardless of cause.

The purpose of this PAMR special topics data brief is to supplement the comprehensive report, A Report on Pregnancy-Associated Deaths in Ohio 2008-2016, with additional information on leading causes of pregnancy-related deaths.

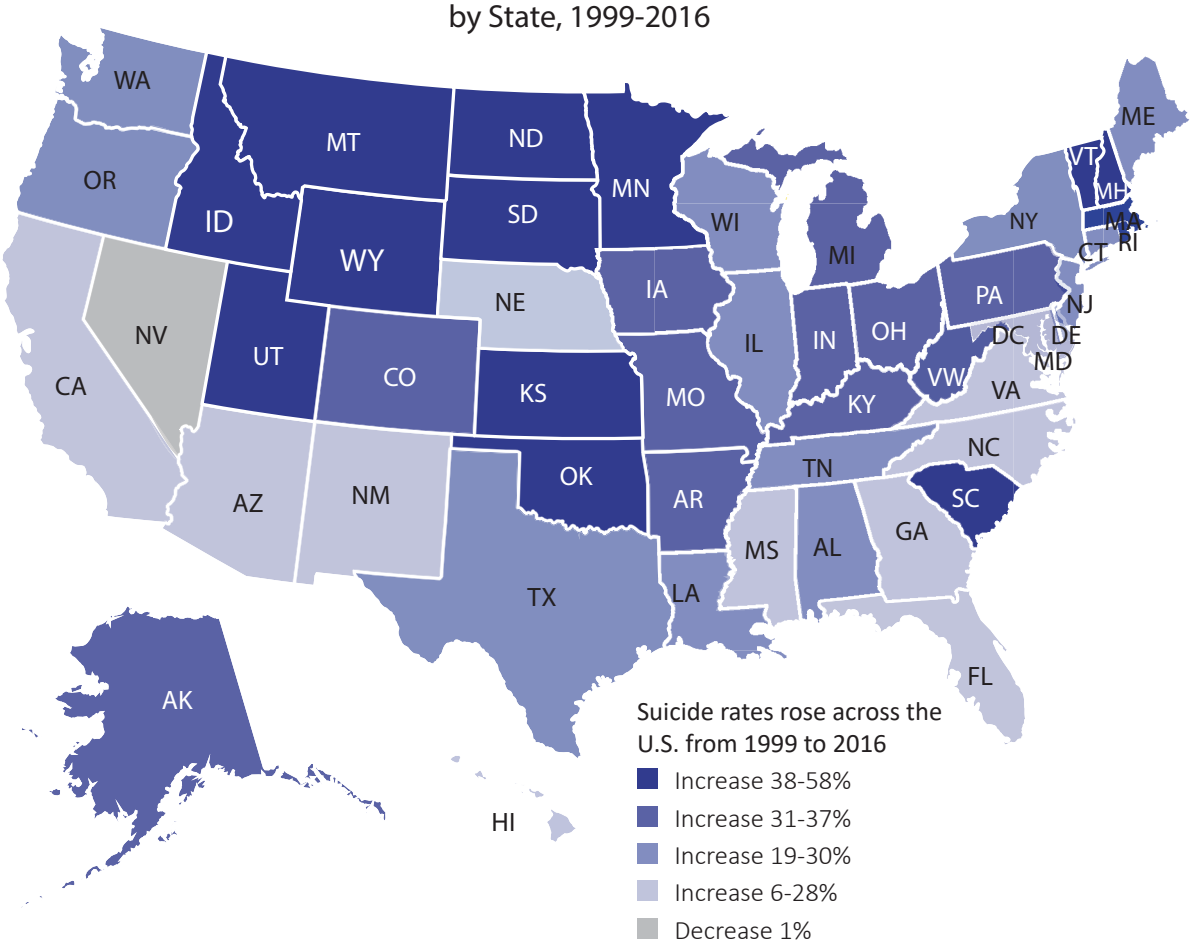
Background on Suicide Among Women of Reproductive Age

Suicide in the United States has risen more than 33% since the turn of the century (Hedegaard, 2018), with 15.6 suicides per 100,000 persons 10 years of age or older in 2016 (Stone, 2018). Rates have increased across all genders, races and urbanization levels. In Ohio, overall suicides have increased by 36% (Figure 1). At a rate of 15.3 suicides per 100,000 persons in 2018, Ohio had the 28th highest suicide rate in the nation (CDC, 2020). Ohioans who died by suicide are more likely to be male, white, have a high school level of education, and live in a rural area (ODH, 2018).

Background on Suicide Among Women of Reproductive Age (continued)

Though suicide occurs more frequently among males, suicide among females is increasing at twice the rate of males (Hedegaard, 2018). From 2008 through 2016, the suicide rate among females in Ohio increased at the same rate as among females nationally, from 4.8 to 6.1 per 100,000 (Figure 2). Females in Ohio are more likely to have a current diagnosed mental health problem (78.5% females vs. 49.5% males), a history of mental health treatment (65.7% females vs. 32.5% males), have made a prior attempt at suicide (35.5% females vs. 14.9% males), have evidence of substance abuse (19.0% females vs. 17.1% males), and die by suicide via overdose (33.9% females vs. 9.0% males) (ODH, 2018). The most common mental illnesses associated with suicide are depression and anxiety. Consistent with findings in other states, more than half of women with a diagnosed mental health condition who die by suicide are receiving treatment at the time of death (Metz, 2016).

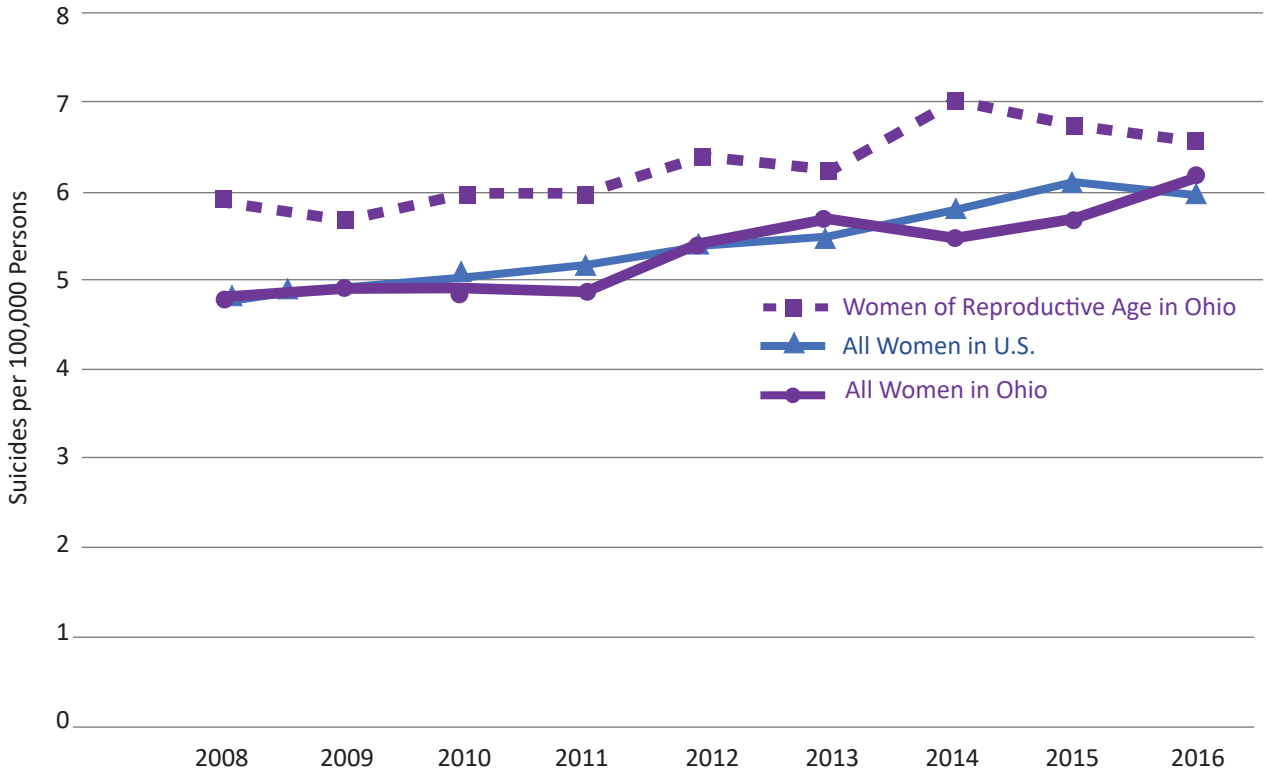
Figure 1: Percentage Change in Incidence of Suicide in the United States by State, 1999-2016



Source: Centers for Disease Control and Prevention (CDC) National Vital Statistics System; CDC Vital Signs, June 2018.

Suicide, among women of reproductive age in Ohio increased marginally from 2008 through 2016, from 5.9 to 6.5 suicides per 100,000 persons (Figure 2). Consistent with national trends, suicides among Ohio women in their reproductive years increase with age, are more likely among women who have never been married, and are more likely among white women compared with Black residents. White residents make up 82% of the population of reproductive-age women but represent 90% of the suicides, while Black residents make up 15% of the population but represent 9% of suicides. Research has found that suicide rates decrease during pregnancy and the postpartum period, despite the prevalence of postpartum depression (Wallace et.al., 2016).

Figure 2: Rate of Suicide Among All Women and Women of Reproductive Age (18-44 Years), by Year, Ohio and the United States 2008-2016



Source: Ohio Public Health Data Warehouse, Ohio Department of Health and (http://publicapps.odh.ohio.gov/EDW/DataCatalog).

Prenatal and Postpartum Depression

Depression affects 10.4% of adult women in the United States and is most common during the reproductive and perimenopausal years (Brody, 2016). As levels of estrogen and progesterone rise during pregnancy then drop rapidly following childbirth, it is common for women to experience feelings of anxiety, doubt, depression, and even anger, as well as insomnia, tearfulness, loss of appetite, and difficulty concentrating. During pregnancy, 70% of women will experience at least one of these depressive symptoms, with 14-23% experiencing a diagnosable major depressive episode (Gaynes, 2005).

In the week immediately following childbirth, this collection of symptoms is termed postpartum blues. Temporary emotional change affects 80% of women after giving birth. Postpartum blues typically subsides within one to two weeks and does not require medication. For 15-20% of new mothers, these intense emotions will remain or return during the first year postpartum and will impair their ability to complete daily tasks. This condition is known as postpartum depression (ACOG, 2013). Suicides among women are more likely to be associated with recent depression if they occur postpartum than if they occur during pregnancy or outside the perinatal period (Gold, 2012). Women with a history of depression outside of pregnancy, prenatal depression, or previous postpartum depression are at increased risk. Women who have unintended pregnancies, experience complications during pregnancy or labor, undergo caesarean section, have babies requiring extended medical care, have a history of intimate partner violence, or lack social support are also at increased risk of developing depression during pregnancy and the postpartum period (Palladino, 2011; ACOG, 2015).

Depression has been linked with poor compliance with prenatal care, smoking, alcohol and drug use, and suicide (ACOG, 2008; Zuckerman, 1989). As previously stated, depression is the most common mental illness among perinatal women who die by suicide, and, as such, is a significant contributing factor to maternal death. Many women being treated for depression prior to conception choose to discontinue their pharmacologic treatment during pregnancy. Around 68% of women with depression who discontinue therapy will relapse at some point during pregnancy (Cohen, 2006). In addition to risks to the mother, exposure to untreated depression in utero puts the fetus at increased risk for low birth weight, neonatal irritability, and, potentially, early developmental delay (ACOG, 2008). Preconception and postpartum counseling regarding depression, as well as screening for depression in the prenatal and postpartum period, are important preventive measures to reduce poor neonatal and maternal outcomes, notably maternal suicide.

The 2016 Ohio Pregnancy Assessment Survey found that only 49.6% of recently pregnant women remembered being asked by their physician about feeling depressed; 49.2% reported being asked about abuse; and 13.6% reported being asked about substance use (OPAS, 2019). This is despite depression, a history of emotional or physical abuse, and substance use being known risk factors for suicide.

PAMR Findings

Among the 610 pregnancy-associated deaths during 2008 through 2016 identified by PAMR, suicide was listed as the manner of death in **40** cases, representing **7%** of pregnancy-associated deaths. This equates to a mortality ratio of **3.2** pregnancy-associated suicide deaths per 100,000 live births. Characteristics of the women who died by suicide are represented below in Table 1. Most women were white, had Medicaid insurance, were 20-29 years of age, were never married, and lived in metropolitan or Appalachian counties. Pregnancy-associated suicide mortality ratios were highest among women who had Medicaid insurance, were ages 20-24, were not married, and lived in Appalachian counties.

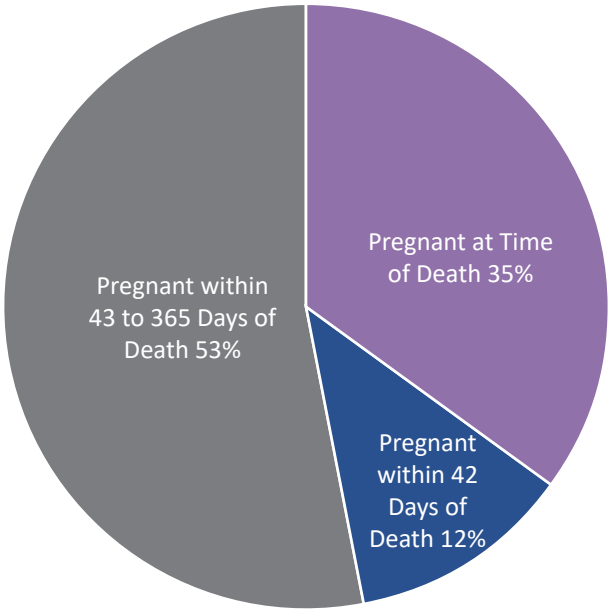
Table 1: Maternal Demographics of Pregnancy-Associated Deaths by Suicide, Ohio 2008-2016

Characteristic	Number	Percentage	Mortality Ratio (per 100,000 live births)
Race and Ethnicity			
Non-Hispanic White	30	75	3.2
Non-Hispanic Black	7	18	*
Hispanic and Other	3	8	*
Insurance Payor			
Medicaid	24	60	4.9
Private	10	25	**1.6
Other	6	15	-
Age Group (years)			
<20	5	13	*
20-24	13	33	**4.1
25-29	10	25	**2.6
30-34	7	18	*
≥35	5	13	*
Marital Status			
Currently Married	14	35	**2.0
Not Married	26	65	4.7
Residence County Type			
Metropolitan	23	58	3.3
Suburban	0	0	*
Appalachian	13	33	**6.3
Rural	4	10	*

** Rates based on fewer than 10 deaths are unstable and not reported.*

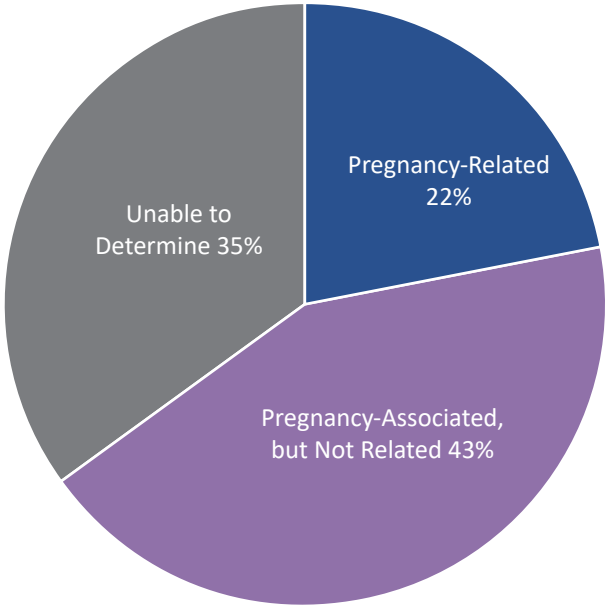
*** Rates based on fewer than 20 deaths should be interpreted with caution.*

Figure 3: Timing of Death in Relation to Pregnancy Among Pregnancy-Associated Deaths by Suicide, Ohio 2008-2016



The PAMR committee concluded that **22% (9)** of the deaths determined to be suicides on the death certificate were pregnancy-related (Figure 4), while **43% (17)** were not related to pregnancy. For **35% (14)** of the deaths, the committee was unable to determine whether or not the death was related to pregnancy.

Figure 4: Pregnancy-Associated Deaths by Suicide, by Pregnancy-Relatedness (n=40) Ohio 2008-2016



Among 36 fully reviewed pregnancy-associated deaths, with manner of death suicide on the death certificate, the committee agreed with the manner in 33 of the 36 deaths (not all 2015-2016 pregnancy-associated deaths were fully reviewed because of the high volume of deaths). The committee was undecided about the manner of death in three deaths that were classified as suicide on the death certificate.

For more than 40% of the suicide deaths, it was determined that substance use disorder contributed to the death (Table 2). The most common means of injury resulting in suicide among women who were pregnant or within a year of pregnancy was firearm (39%); followed closely by hanging, strangulation, or suffocation (36%); and then poisoning or overdose (14%).

Table 2: Substance Use Disorder and Means of Injury Among Reviewed Pregnancy-Associated Deaths with Suicide as the Manner of Death (n=36), 2008-2016

	Number	Percent
Substance Use Disorder		
Substance use disorder contributed to the death	15	42
Means of Injury		
Firearm	14	39
Hanging/Strangulation/Suffocation	13	36
Poisoning/Overdose	5	14
Motor Vehicle Accident	2	6
Fall	1	3
Drowning	1	3

Due to rounding, some totals may not correspond with the sum of the separate figures.

A total of 202 factors that contributed to death were identified for the 36 reviewed suicide deaths. Contributing factors were common at the patient or family level, with 124 factors identified by the committee. The most common individual level factor was mental health conditions, such as depression and anxiety. Other individual or family level factors were related to substance use disorder, adherence with medical recommendations, knowledge of treatment, follow-up treatment, violence, and social support. At the provider level, common factors that contributed to the death included inadequate assessment, poor communication, and delay. At the system or facility level, the most common factor that contributed to the suicide deaths was lack of continuity of care or care coordination. Other factors included communication, access barriers, and outreach inadequacies.

Table 3: Contributing Factors Among 36 Reviewed Pregnancy-Associated Deaths With Suicide as the Manner of Death, Ohio 2008-2016

Factor Class	Count	Representative Themes
Provider Factor Level		
Assessment	11	Failure to screen; inadequate assessment of risk
Communication	6	Lack of communication between providers
Delay	5	Delay in or lack of diagnosis, treatment, or follow up (social worker)
Referral	5	Failure to refer or seek consultation
System/Facility Factor Level		
Continuity of Care/Care Coordination	16	Lack of continuity of care; lack of case management; lack of mental healthcare coordination
Communication	7	Poor communication
Access/Financial	8	Provider shortages; inadequate or unavailable mental health facilities; insurance barriers; transportation barriers
Outreach	6	Inadequate community outreach or services
Patient/Family Factor Level		
Mental Health Conditions	31	Depression; anxiety; postpartum depression; cognitive impairment
Substance Use Disorder	16	Alcohol; illicit drugs; prescription medication misuse; opiates in toxicology screen
Adherence	11	Nonadherence with medical recommendations; failure to adhere because of lack of insurance or financial resources
Knowledge	10	Lack of knowledge of treatment or follow up; lack of knowledge of importance of event
Violence	10	Intimate partner violence
Social Support/Isolation	10	Lack of family or friend support system; isolation
Chronic Disease	7	Chronic pain; other chronic medical condition
Childhood Abuse/Trauma	6	Childhood sexual abuse; childhood trauma
Access/Financial	4	Uninsured; lack of financial resources
Delay	4	Delay or failure to seek care
TOTAL	202	

Ashley's Story — Mental Health in Pregnancy

"Ashley" was a 25-year-old white woman with one past pregnancy that ended in miscarriage and was 21 weeks pregnant at the time of her death. Ashley's past medical history was significant for depression and anxiety, and a suicide attempt three years previously. Ashley had been on an antidepressant medication for several years but self-discontinued as soon as she realized she was pregnant. Ashley experienced intimate partner violence both in her current relationship and in past relationships.

Prenatal Period: Ashley entered prenatal care in the first trimester, at 11 weeks gestation, and had three prenatal care visits. She received a referral for mental health care and saw an out-patient counselor twice. When she was 14 weeks pregnant, she had an exacerbation of anxiety and depression and was seen in the emergency department. She had a positive urine toxicology for marijuana. She was evaluated by psychiatry and released to outpatient mental health. Her last mental health visit was at 18 weeks of pregnancy. She was not prescribed antidepressant or anti-anxiety medication.

Ashley had multiple environmental stressors during pregnancy that led to social isolation. These included intimate partner violence, a recent move to a new community, loss of beloved pet, and a disabled vehicle leading to sudden transportation problems. At 21 weeks gestation, Ashley died by suicide by gunshot.

Cause of death on her death certificate was trauma due to gunshot wound to the head and manner was suicide. The autopsy was conducted by a county coroner.

Key Questions Answered by the Committee

Was the Death Pregnancy-Related?

Yes. Ashley was inadequately treated for her depression in major part because of fear by both the patient and some of her providers that antidepressants might be harmful in pregnancy. Women with known major depression who discontinue medication are at a high risk of relapse.

What was the Cause of Death?

Mental health conditions.

Was There Some Opportunity to Alter Outcome?

Yes. The patient had a history of chronic depression with prior suicide attempt. At a point in her life with increased stress, she self-discontinued her medication. She was seen clinically for an exacerbation of symptoms, but her medication was not restarted.

Table 4: Contributing Factors and Corresponding Recommendations Among 36 Reviewed Pregnancy-Associated Deaths With Suicide as the Manner of Death, Ohio 2008-2016

What Were the Factors That Contributed to This Death?	What Are the Recommendations and Actions That Address Those Contributing Factors?
Mental health (patient/family level)	Optimize treatment for pregnant and postpartum women with mental health issues. Implement provider training on suicide risk assessment/ depression screening.
Social isolation (individual level)	Optimize case management for mental health, particularly between the pregnant and postpartum periods.
Use of ineffective treatment (provider level)	Improve statewide efforts at suicide prevention by partnering with the Ohio Department of Mental Health and Addiction Services (OhioMHAS).
Failure to refer to community resources (system level)	Partner with the OhioMHAS to develop and disseminate resources for patients, families, and healthcare providers in communities.

Case is fictitious but based on real events.

PAMR Initiatives

ODH and PAMR are supporting two initiatives to improve education and screening around maternal depression.

1. The IMPLICIT Interconception Care Model will be implemented in pediatric care settings across Ohio. The multi-phase IMPLICIT (Interventions to Minimize Preterm and Low birth weight Infants through Continuous Improvement Techniques) uses quality improvement science to address preterm births, low birth weight, and infant mortality between births by screening of new mothers during well-child visits. Studies have shown mothers are highly receptive to health advice at well-child visits, and IMPLICIT models the American Academy of Pediatrics guidance to screen mothers for depression at well-child visits (Rosener, 2016). Baby blues can be treated with self-care and psychosocial support, while postpartum depression and anxiety usually require treatment. Treatment options include self-care, antidepressant/anxiety medications, support groups, individual or group counseling, or hospitalization. Postpartum psychosis requires hospitalization. This project will educate mothers about the effects of untreated depression and anxiety on healthy pregnancies and birth outcomes and provide resources and/or referrals to mothers who receive a positive screen to access appropriate services.

2. Urgent Maternal Warning Signs (UMWS) is a quality improvement project that will be implemented by public health programs. Warning signs education can help new mothers recognize signs and symptoms of postpartum depression. Early detection of these symptoms can be crucial to getting Mom into treatment quickly.

The Suicide Prevention Crisis Lifeline and Textline provide 24/7 access to crisis counselors who can provide free and confidential support and/or advice when someone has an immediate need.
Suicide Prevention Crisis Hotline: 1-800-273-8255 or Text '4HOPE' to: 741-741

References

The American College of Obstetricians and Gynecologists. (2008). Practice Bulletin 92: Use of psychiatric medications during pregnancy and lactation. Retrieved from: https://www.acog.org/Clinical-Guidance-and-Publications/Practice-Bulletins/Committee-on-Practice-Bulletins-Obstetrics/Use-of-Psychiatric-Medications-During-Pregnancy-and-Lactation.

The American College of Obstetricians and Gynecologists. Frequently asked questions: Postpartum depression. (2013, December). Retrieved from: https://www.acog.org/Patients/FAQs/Postpartum-Depression. Accessed July 20, 2020.

Brody DJ, Pratt LA, Hughes, JP. (2018, February). Prevalence of depression among adults aged 20 and over: United States, 2013–2016. National Center for Health Statistics (NCHS) Data Brief, no. 303. Retrieved from: https://www.cdc.gov/nchs/data/databriefs/db303.pdf. Accessed July 20, 2020.

Centers for Disease Control and Prevention (CDC)/National Center for Health Statistics (NCHS). (2020, April 29). Suicide Mortality by State. Retrieved from: https://www.cdc.gov/nchs/pressroom/sosmap/suicide-mortality/suicide.htm. Accessed October 1, 2020.

References

Cohen, LS, Altshuler, LL, Harlow, BL, Nonacs, R, Newport, DJ, Viguera, AC, Suri, R, . . . Stowe, ZN. (2006, July 12). Relapse of major depression during pregnancy in women who maintain or discontinue antidepressant treatment. *JAMA*, *295*(5), 499–507.

Gaynes, BN, Gavin, N, Meltzer-Brody, S, Lohr, KN, Swinson, T, Gartlehner, G, Brody, S, Miller WC. (2005, February). Perinatal depression: prevalence, screening accuracy and screening outcomes. *AHRQ Evidence Report/Technology Assessment, 119,* 1-8.

Gold, K, Singh, V, Marcus, SM, Palladino, CL. (2012, March-April). Mental health, substance use, and intimate partner violence problems among pregnant and postpartum suicide victims in the National Violent Death Reporting System. *General Hospital Psychiatry, 34*(2), 139-145.

Hedegaard, H, Curtin, SC, Warner, M. (2018, November). Suicide Mortality in the United States, 1999-2017. ***NCHS Data Brief,*** no 330. Hyattsville, MD: National Center for Health Statistics.

Metz, TD, Rovner, P, Hoffman, MC, Allshouse, AA, Beckwith, KM, Binswanger, IA. (2016, December). Maternal deaths from suicide and overdose in Colorado, 2004-2012. *Obstetrics & Gynecology, 128*(6), 1233-1240.

Ohio Department of Health (ODH). (2018). Ohio Violent Death Reporting System, 2015 annual report." Retrieved from https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/core-violence-injury-prevention-program/media/ohvdrs-2015-final/. Accessed July 20, 2020.

Ohio Pregnancy Assessment Survey (OPAS), Ohio Department of Health (ODH). (2019). Retrieved from https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/ohio-pregnancy-assessment-survey-opas/welcome/. Accessed August 28, 2020.

Palladino, CL, Singh, V, Campbell, J, Flynn, H, Gold, KJ. (2011, November). Homicide and suicide during the perinatal period: findings from the National Violent Death Reporting System. *Obstetrics & Gynecology, 118*(5), 1056-1063.

Rosener, S. E. (2016). Interconception Care for Mothers During Well-Child Visits With Family Physicians: An IMPLICIT Network Study. *Annals of Family Medicine, Inc.,* 350-355.

Stone, DM, Simon, TR, Fowler, KA, Kegler, SR, Yuan, K, Holland, KM, Ivey-Stephenson, AZ, Crosby, AE. (2018, June 8). Vital Signs: trends in state suicide rates- United States, 1999-2016 and circumstances contributing to suicide—27 states, 2015. Morbidity and *Mortality Weekly Report, 67*(22), 617-624. Retrieved from https://www.cdc.gov/mmwr/volumes/67/wr/mm6722a1.htm. Accessed July 20, 2020.

Wallace, ME, Hoyert, D, Williams, C, Mendola, P. (2016, September). Pregnancy-associated homicide and suicide in 37 US states with enhanced pregnancy surveillance. *American Journal of Obstetrics and Gynecology, 215*(3), 364.e1-364.e10.

Zuckerman, B, Amaro, H, Bauchner, H, Cabral, H. (1989, May). Depressive symptoms during pregnancy: relationship to poor health behaviors. *American Journal of Obstetrics and Gynecology, 160*(5 Pt. 1), 1107-1111.