

Maternal Mortality Nevada, December 2018-2020

December 2020



Office of Analytics

Department of Health and Human Services

Steve Sisolak
*Governor
State of Nevada*

Lisa Sherych
*Administrator
Division of Public and Behavioral Health*

Richard Whitley, MS
*Director
Department of Health and Human Services*

Ihsan Azzam, Ph.D., MD
*Chief Medical Officer
Division of Public and Behavioral Health*

Acknowledgements

Report Prepared by:

Jie Zhang, MS

Maternal and Child Health Biostatistician
Office of Analytics
Nevada Department of Health and Human Services

Editing, Review, and Comments:

Amy Lucas, MS

Health Resource Analyst II
Office of Analytics
Nevada Department of Health and Human Services

Jennifer Thompson, BS

Behavioral Health Data Manager
Office of Analytics
Nevada Department of Health and Human Services

Kyra Morgan, MS

Chief Biostatistician
Office of Analytics
Nevada Department of Health and Human Services

Vickie Ives, MA

Maternal, Child and Adolescent Health Section Manager
Division of Public and Behavioral Health
Nevada Department of Health and Human Services

Tami Conn

Health Program Specialist II
Division of Public and Behavioral Health
Nevada Department of Health and Human Services

Martha Framsted

Public Information Officer
Division of Public and Behavioral Health
Nevada Department of Health and Human Services

For Additional Information Contact:

Jie Zhang, MS

Maternal and Child Health Biostatistician
Office of Analytics
Nevada Department of Health and Human Services

4126 Technology Way, Suite 200

Carson City, Nevada 89706

(775) 684-5933

data@dhhs.nv.gov

Table of Contents

Acknowledgements.....	ii
Background	3
Methodology.....	3
Data Sources	3
Definitions.....	3
Identification of Pregnancy-Associated Deaths	4
Identifying by Vital and Hospital Discharge Records Linkages.....	4
Identifying by Causes of Death Information	4
Identifying by Pregnancy Checkboxes on the Death Records.....	5
Additional Data Sources.....	5
Analysis	5
Data of December 2018 to December 2019	7
Demographics	7
Underlying Cause of Pregnancy-Associated Deaths	10
Drug Overdose Deaths	11
Data of 2020.....	12
Demographics	12
Underlying Cause of Pregnancy-Associated Deaths	15
Drug Overdose Deaths	15
Pregnancy-Related Deaths from Pregnancy Mortality Surveillance System (PMSS).....	17
Demographics	17
Cause of Pregnancy-Related Deaths.....	20
References	21

Background

The Nevada Maternal Mortality Review Committee convened in 2020. The committee reviews all pregnancy-associated deaths (all deaths of women while pregnant or within one year of the end of pregnancy, due to any cause) and develops recommendations to prevent future deaths. The purpose of this report is to provide insight into demographic characteristics, cause of death, and drug overdose death associated with pregnancy-associated deaths from December 2018 to November 2020. This report also provides data on pregnancy-related deaths from Pregnancy Maternal Surveillance System (PMSS) during 2012 and 2017. PMSS is a national surveillance conducted by Centers for Disease Control and Prevention (CDC) to better understand the risk factors for and causes of pregnancy-related deaths in the United States.

Methodology

Data Sources

Web-Enabled Vital Records Registry Systems (WEVRRS)

Statewide births, deaths, and fetal births are collected by the Office of Vital Records, in the Division of Public and Behavioral Health. WEVRRS is a software utilized by physicians, registered nurses, midwives, informants or funeral directors, and other individuals to collect and consolidate birth and death-related information.

Hospital Billing Data (Emergency Department Encounter and Hospital Inpatient Admissions)

The hospital billing data provides health billing data for emergency department encounters and inpatient admissions for Nevada's non-federal hospitals. NRS 449.485 mandates all hospitals in Nevada report information as prescribed by the Director of the Department of Health and Human Services. The data are collected using a standard universal billing form. The data includes demographics such as age, gender, race/ethnicity, and uses International Classification of Diseases-9-Clinical Modification (ICD-9-CM) diagnoses codes and International Classification of Diseases-10-Clinical Modification (ICD-10-CM) diagnoses. ICD-10-CM diagnoses codes replaced ICD-9-CM diagnoses codes in the last quarter of 2015. Therefore, data prior to last quarter in 2015 may not be directly comparable to data thereafter. In addition, the data includes billed hospital charges, procedure codes, discharge status, and external cause of injury codes. The billing information is for billed charges and not the actual payment received by the hospital.

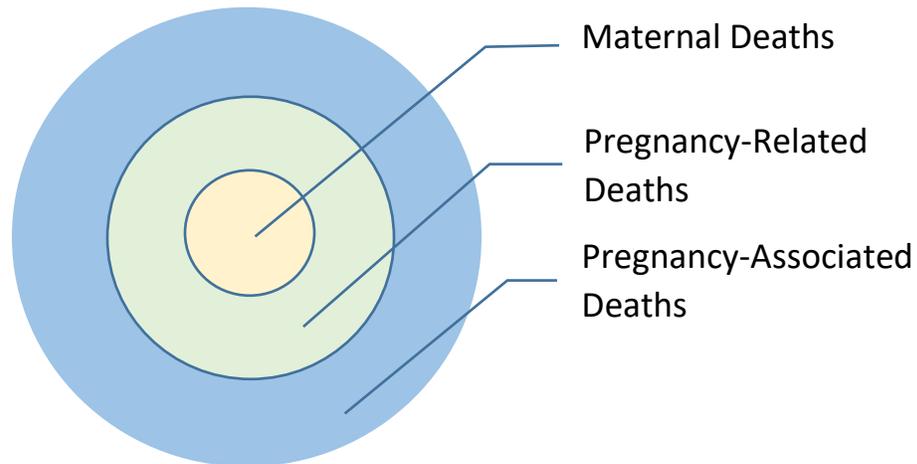
Definitions

Pregnancy-Associated Death is the death of a woman while pregnant or within one year of the termination of pregnancy, regardless of the cause. Pregnancy-associated death ratio is the number of pregnancy-associated deaths per 100,000 live births.

Pregnancy-Related Death is the death of a woman during pregnancy or within one year of the end 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. Pregnancy-related death ratio is the number of pregnancy-related deaths per 100,000 live births.

Maternal Death is the death of a woman while pregnant or within 42 days of the termination of pregnancy, regardless of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

Figure 1. Relationship among Three Definitions



Identification of Pregnancy-Associated Deaths

The methodology is based on Reference Guide for Pregnancy-Associated Death Identification which was developed by the Pregnancy-Associated Death Identification Workgroup, consisting of members from state departments of health and the Centers for Disease Control and Prevention (CDC)¹.

Identifying by Vital and Hospital Discharge Records Linkages

A death data set is created for a given year for all Nevada female residents ages 10-60 years. Two data sets (birth and fetal death records, delivery and postpartum emergency department encounter and hospital inpatient admission records) are created for the same given calendar year and previous calendar year. Death records of women ages 10-60 years are first linked with birth and fetal death records based on mother's social security number (SSN). Death records of women ages 10-60 years that are not linked using SSN are then matched to birth and fetal death records using mother's first name, mother's last name, and mother's date of birth. Non-matched death records are then linked with delivery and postpartum emergency department encounter and hospital inpatient admission records based on mother's SSN, mother's name, and date of birth. SAS software is used for the linkages.

Identifying by Causes of Death Information

Some pregnancy-associated deaths, such as those occurred early during pregnancy, will not have birth or fetal death records to link. In order to identify pregnancy-associated deaths among those death records, we select death records of female ages 10-60 where the underlying causes of death were coded in A34 and O00-O99.9 (i.e. ICD-10 codes related to pregnancy) and/or the literal death cause field contains any of the following pregnancy-related terms: amniotic, chorioamnionitis, eclampsia, ectopic, intrauterine fetal demise, peripartum, peripartum cardiomyopathy, placental, postpartum, pregnancy, pregnant,

uterine hemorrhage, and uterine rupture. Selected pregnancy-associated deaths should be confirmed with additional data sources to avoid misclassification. Examples of additional confirmatory sources are provided in the section on Additional Data Sources.

Identifying by Pregnancy Checkboxes on the Death Records

We also select death records of female ages 10-60 where the pregnancy checkbox on the death record checked as: pregnant at time of death, not pregnant but pregnant within 42 days of death, or not pregnant but pregnant 43 days to one year before death. Selected pregnancy-associated deaths should be confirmed with additional data sources to avoid misclassification. Examples of additional confirmatory sources are provided in the section on Additional Data Sources.

Additional Data Sources

Additional data sources identified by the Pregnancy-Associated Death Identification Workgroup that can help confirm pregnancy for deaths which do not link to vital records and hospital discharge records, but have pregnancy indicated by causes of death information and/or pregnancy checkbox on the death record.

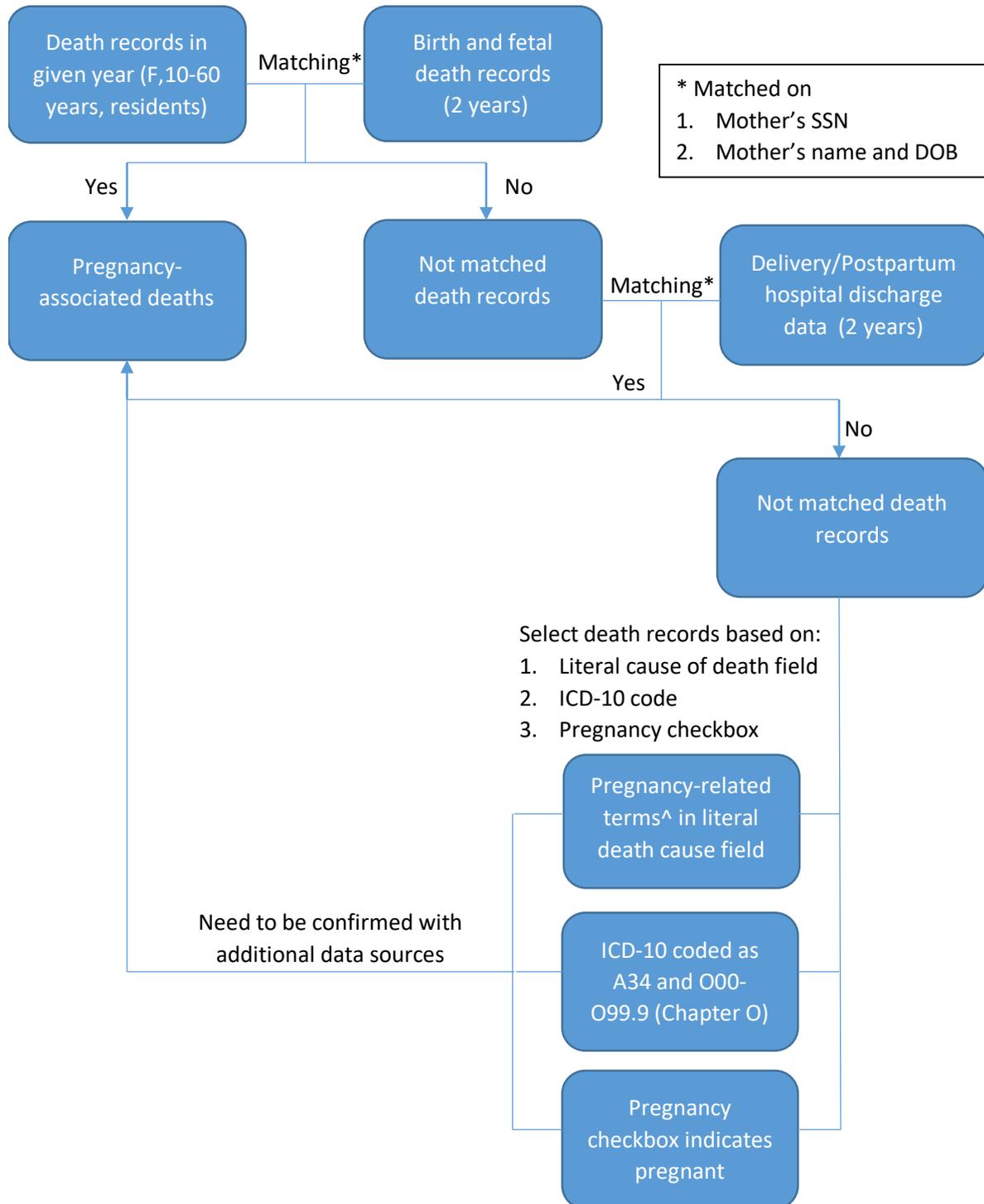
- Obituaries
- Social Media
- Media and News Reports
- Certifier Confirmation
- Autopsy Reports

Analysis

The analyses in the report are for pregnancy-associated deaths for Nevada residents only. Pregnancy-associated death ratio was calculated as the number of pregnancy-associated deaths per 100,000 live births. Pregnancy-related death ratio was calculated as the number of pregnancy-related deaths per 100,000 live births.

The linkages and analyses were performed by using SAS 9.4.

Figure 2. Flow Chart of Identifying Pregnancy-Associated Deaths

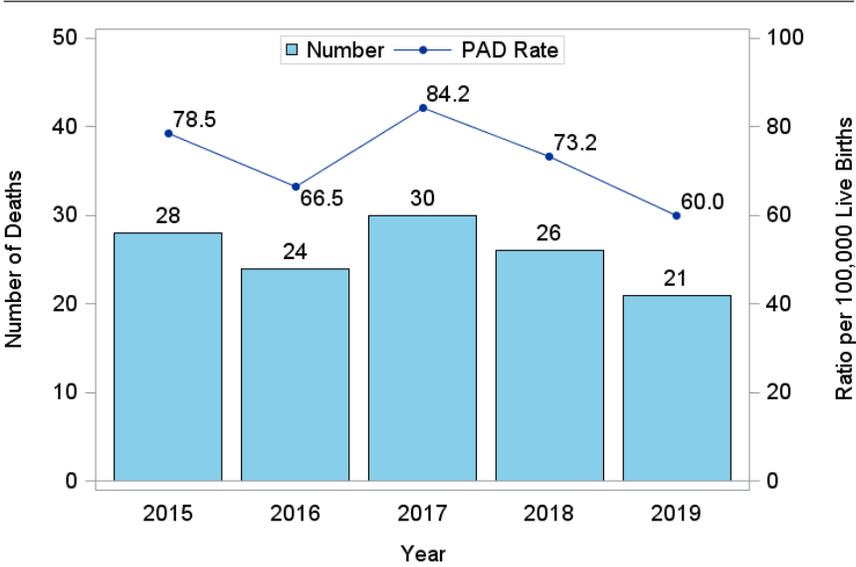


^ Pregnancy-related terms are amniotic, chorioamnionitis, eclampsia, ectopic, intrauterine fetal demise, peripartum, peripartum cardiomyopathy, placental, postpartum, pregnancy, pregnant, uterine hemorrhage, and uterine rupture.

Data of December 2018 to December 2019

There were 129 pregnancy-associated deaths in Nevada from 2015 to 2019. There was no consistent increasing or decreasing trend in pregnancy-associated death ratio, with the highest ratio in 2017, at 84.2 per 100,000 live births. The sections below explain the demographics, underlying cause of death, and drug overdose death associated with pregnancy-associated deaths from December 2018 to December 2019. There were total 22 pregnancy-associated deaths from December 2018 to December 2019, with pregnancy-associated death ratio at 57.9 per 100,000 live births.

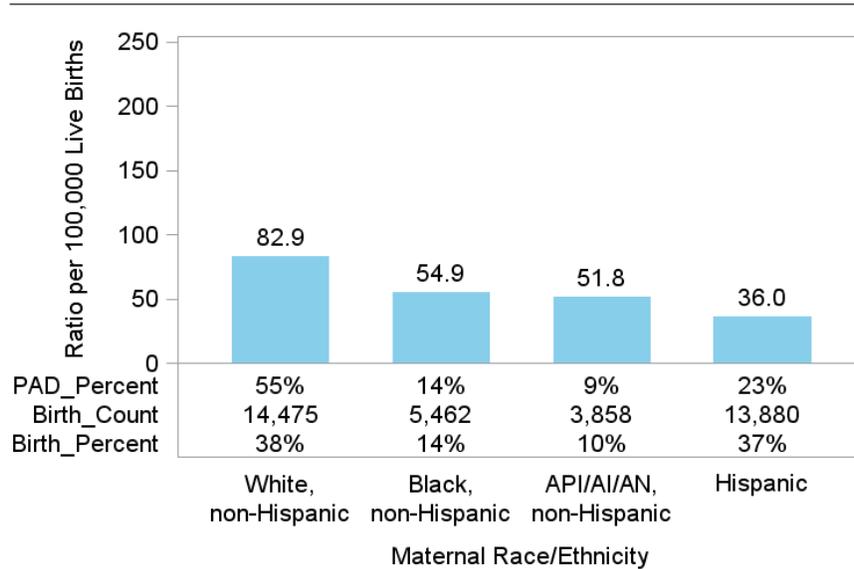
Figure 3. Pregnancy-Associated Death Ratio per 100,000 Live Births and Number of Deaths, Nevada, 2015 - 2019



Demographics

Figure 4 shows that White, non-Hispanic women had highest pregnancy-associated death ratio at 82.9 per 100, 000 live births and 55% of the pregnancy-associated deaths occurred among White, non-Hispanic women. Hispanic women had lowest ratio at 36.0 per 100,000 live births, accounting for 23% of all deaths. Thirty-eight percent of women who gave births during December 2018 through 2019 were White, non-Hispanic, and 37% were Hispanic women.

Figure 4. Pregnancy-Associated Death Ratio and Percent by Race/Ethnicity Nevada, December 2018 - December 2019



In Figure 5, women aged 40 and older had the highest pregnancy-associated death ratio at 147.6 per 100,000 live births, followed by ratio of women aged 20 and under at 109.9 per 100,000 live births and ratio of women aged 35-39 at 108.7 per 100,000 live births. Seventy-three percent of the deaths occurred among women aged 25 to 39. Thirty percent of births during December 2018 through 2019 were given by women aged 25 to 29, and 27% of births were given by women aged 30 to 34.

Figure 5. Pregnancy-Associated Death Ratio and Percent by Maternal Age Nevada, December 2018 - December 2019

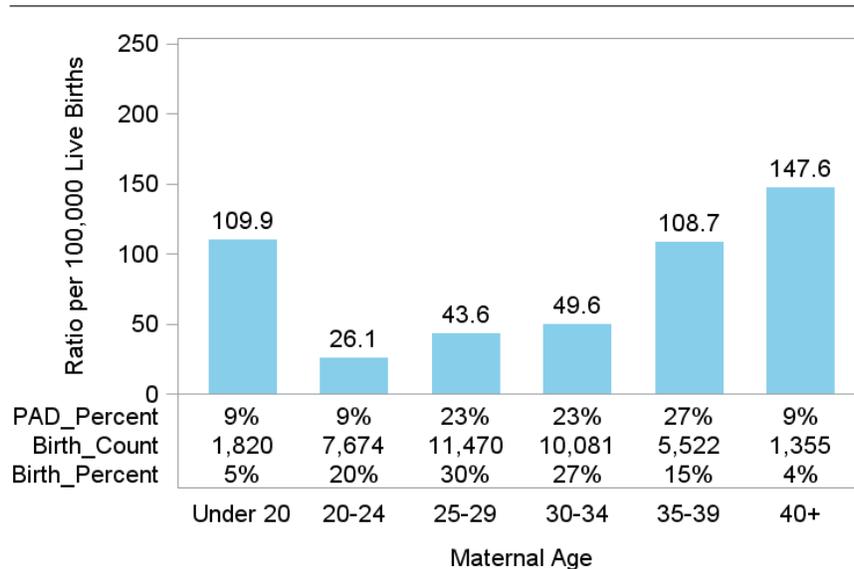


Figure 6 illustrates pregnancy-associated death ratio for each race and ethnicity within age groups of under 25, 25-34, and 35 and older. For women aged under 25 and 25 to 34 White, non-Hispanic had the highest ratio, at 107.3 per 100,000 live births and 67.8 per 100,000 live births, respectively. For women

35 and older Hispanic had the highest ratio at 140.1 per 100,000 live births, followed by Black, non-Hispanic at 128.7 per 100,000 live births.

Figure 6. Pregnancy-Associated Death Ratio by Maternal Age and Race/Ethnicity, Nevada, December 2018 - December 2019

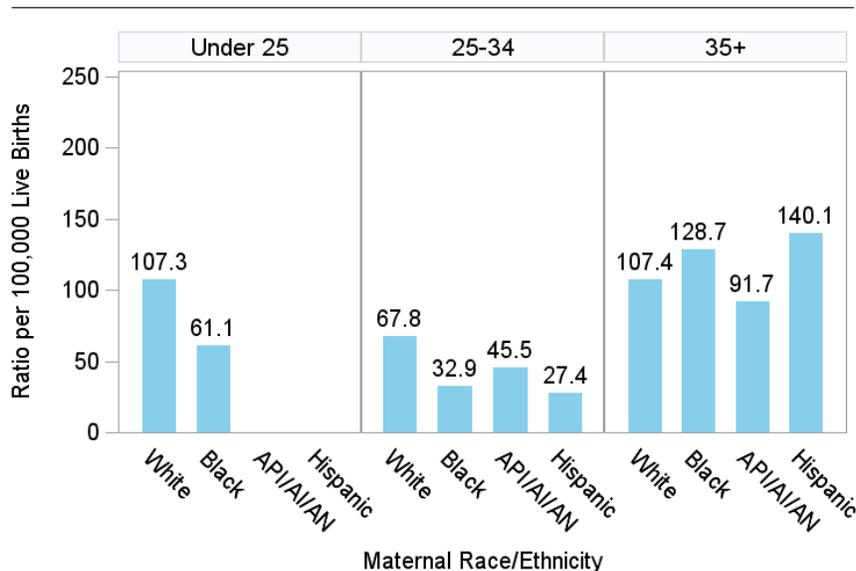


Figure 7 shows that most of the pregnancy-associated deaths (82%) occurred in Clark County. Also, Clark County had the highest pregnancy-associated death ratio at 63.2 per 100,000 live births. Seventy-five percent of the births during December through 2019 occurred in Clark County.

Figure 7. Pregnancy-Associated Death Ratio and Percent by County of Residence, Nevada, December 2018 - December 2019

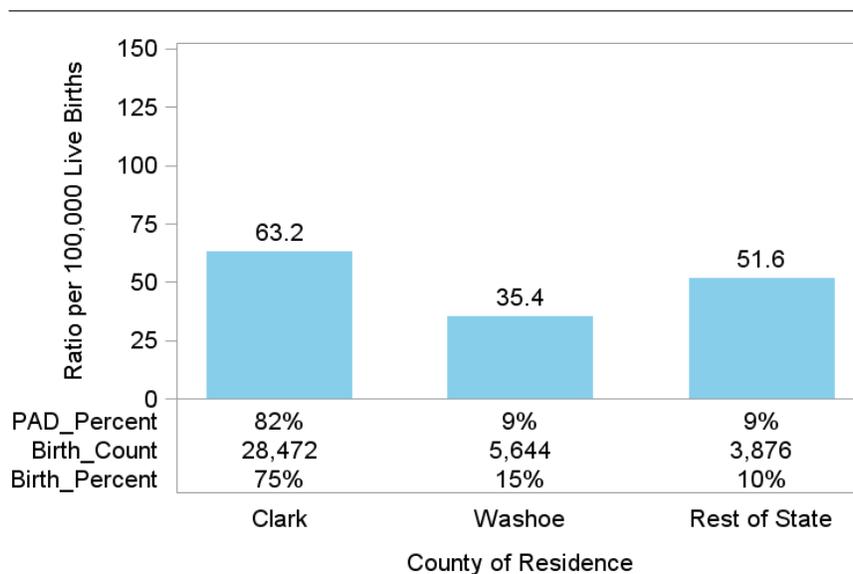
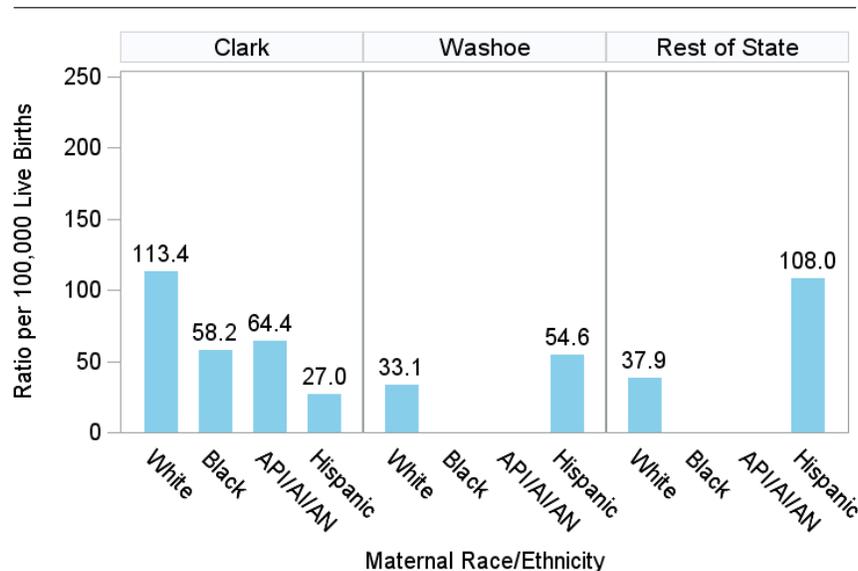


Figure 8 illustrates pregnancy-associated ratio for each race and ethnicity group within Clark County, Washoe County and Rest of State. In Clark County White, non-Hispanic women had the highest ratio at

113.4 per 100,000 live births. While in Washoe County and Rest of State, Hispanic women had the highest ratio at 54.6 per 100,000 live births and 108.0 per 100,000 live births respectively.

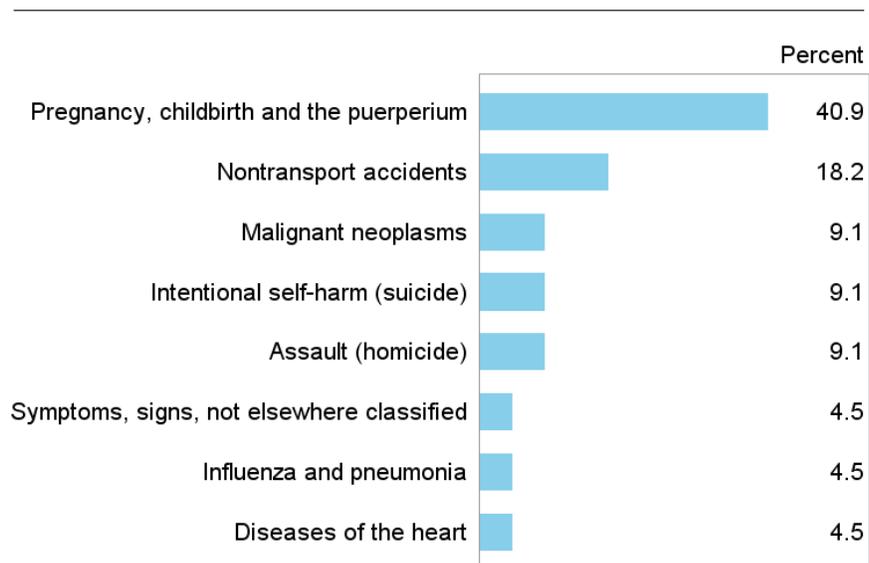
Figure 8. Pregnancy-Associated Death Ratio by Residence County and Race/Ethnicity, Nevada, December 2018 - December 2019



Underlying Cause of Pregnancy-Associated Deaths

During December 2018 and December 2019, the most common underlying death cause was pregnancy, childbirth and the puerperium, accounting for 40.9% of all pregnancy-associated deaths. The second most common death cause was nontransport accidents, accounting for 18.2% of all deaths. All nontransport accidents deaths were due to unintentional drug overdose.

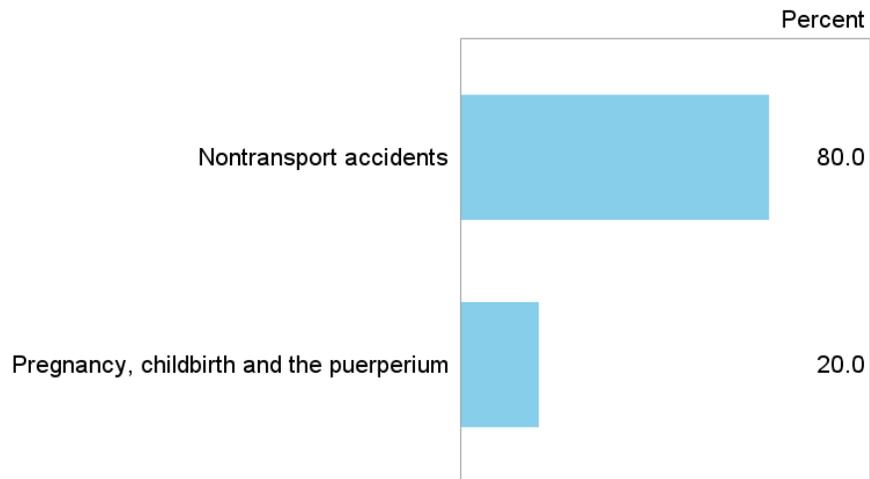
Figure 9. Underlying Cause of Death of Pregnancy-Associated Deaths Nevada, December 2018 - December 2019



Drug Overdose Deaths

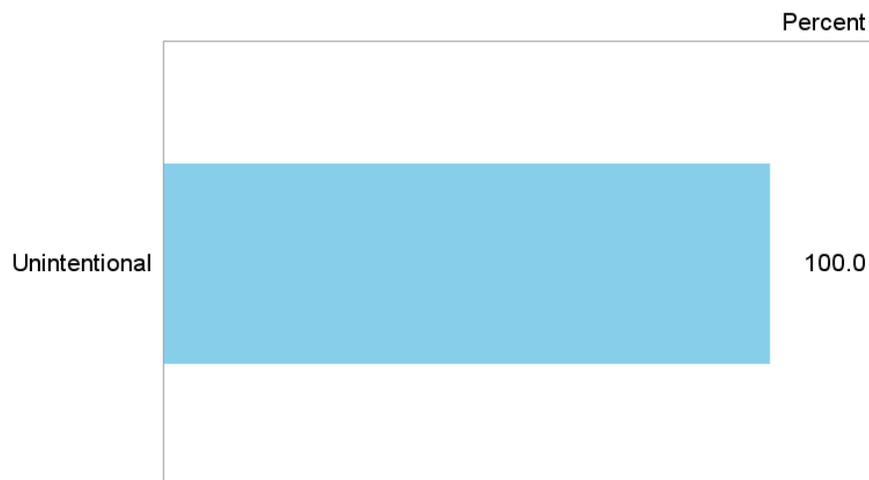
Drug overdose deaths were identified using underlying and contributing ICD-10 cause-of-death codes: X40-X44 (unintentional), X60-X64 (suicide), X85 (homicide), and Y10-Y14 (undetermined). Figure 10 shows 80% of drug overdose deaths had nontransport accidents as underlying death cause. Figure 11 shows that all drug overdose deaths were unintentional deaths.

Figure 10. Drug Overdose Deaths by Underlying Cause of Death, Nevada, December 2018 - December 2019



Drug overdose deaths are identified using underlying and contributing ICD-10 cause-of-death codes: X40-X44(unintentional), X60-X64(suicide), X85(homicide), and Y10-Y14(undetermined).

Figure 11. Drug Overdose Deaths by Intention, Nevada, December 2018 - December 2019



Drug overdose deaths are identified using underlying and contributing ICD-10 cause-of-death codes: X40-X44(unintentional), X60-X64(suicide), X85(homicide), and Y10-Y14(undetermined).

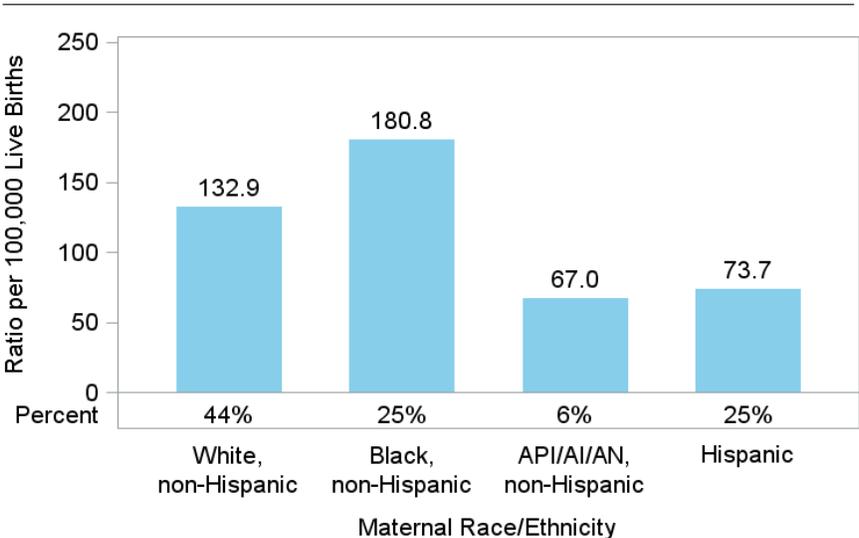
Data of 2020

There were 32 pregnancy-associated deaths in 2020, with ratio at 107.4 per 100,000 live births. The sections below explain the demographics, underlying cause of death, and drug overdose death that are associated with pregnancy-associated deaths in 2020. Data for 2020 are preliminary and subject to changes.

Demographics

Figure 12 shows that Black, non-Hispanic women had highest pregnancy-associated death ratio at 180.8 per 100,000 live births and 25% of the pregnancy-associated deaths occurred among Black, non-Hispanic women. Asian/Pacific Islander/American Indian/American Native (API/AI/AN), non-Hispanic women had lowest death ratio at 67.0 per 100,000 live births, accounting for 6% of all deaths.

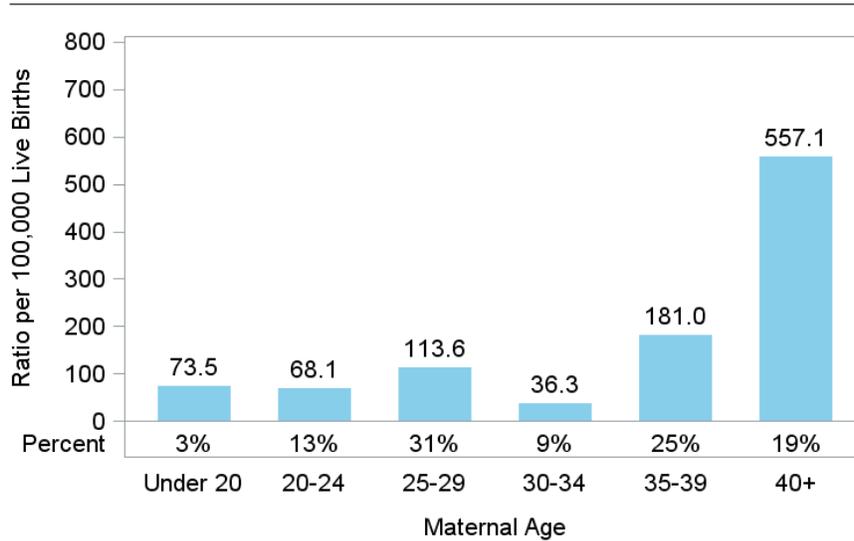
Figure 12. Pregnancy-Associated Death Ratio and Percent by Race/Ethnicity Nevada, 2020



2020 data are preliminary and subject to changes.

In Figure 13, women aged 40 and older had the highest pregnancy-associated death ratio at 557.1 per 100,000 live births, followed by women aged 35-39 at a ratio of 181.0 per 100,000 live births. Forty-four percent of the deaths occurred among women aged 35 and older.

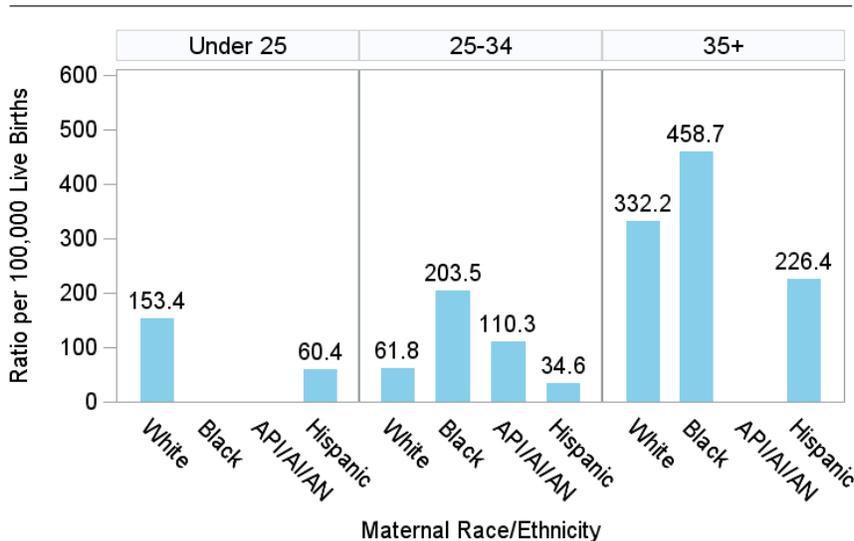
Figure 13. Pregnancy-Associated Death Ratio and Percent by Maternal Age Nevada, 2020



2020 data are preliminary and subject to changes.

Figure 14 illustrates pregnancy-associated death ratio for each race and ethnicity within age groups of under 25, 25-34, and 35 and older. For women aged 25 to 34, and 35 and older, Black non-Hispanic had the highest death ratio, at 203.5 per 100,000 live births and 458.7 per 100,000 live births, respectively. For women 25 and under White non-Hispanic women had the highest death ratio at 153.4 per 100,000 live births.

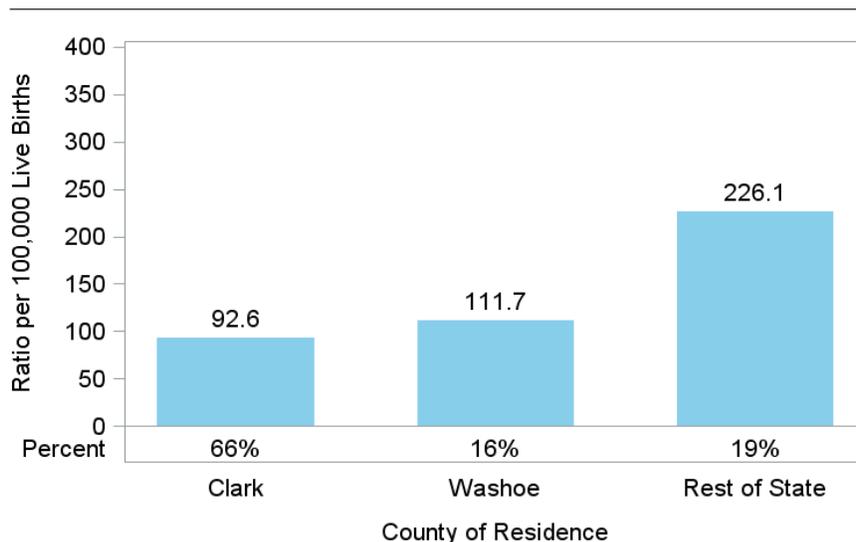
Figure 14. Pregnancy-Associated Death Ratio by Maternal Age and Race/Ethnicity, Nevada, 2020



2020 data are preliminary and subject to changes.

Figure 15 shows that 66% of pregnancy-associated deaths occurred in Clark County. The Rest of State had the highest pregnancy-associated death ratio at 226.1 per 100,000 live births.

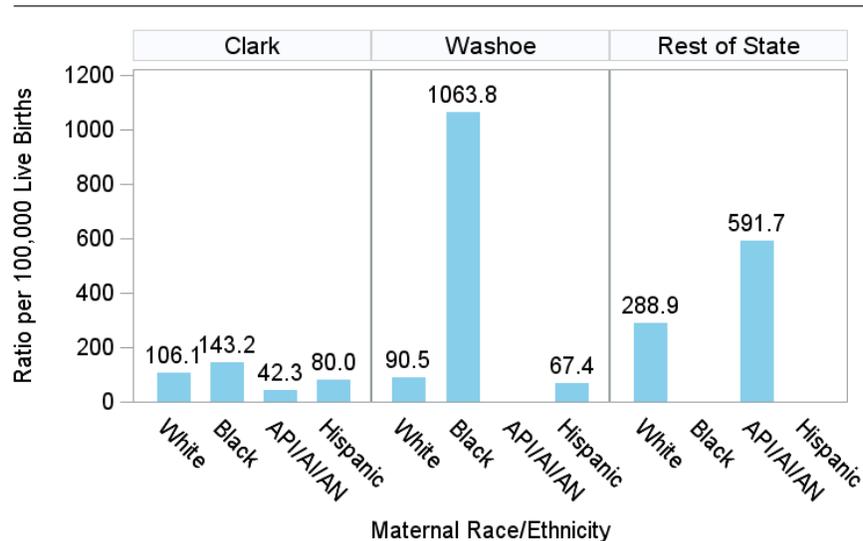
Figure 15. Pregnancy-Associated Death Ratio by County of Residence Nevada, 2020



2020 data are preliminary and subject to changes.

Figure 16 illustrates pregnancy-associated death ratio for each race and ethnicity group within Clark County, Washoe County and Rest of State. In Clark County and Washoe County Black, non-Hispanic women had the highest ratio at 143.2 per 100,000 live births and 1,063.8 per 100,000 live births, respectively. In Rest of State, Asian/Pacific Islander/American Indian/American Native (API/AI/AN), non-Hispanic had the highest ratio at 591.7 per 100,000 live births.

Figure 16. Pregnancy-Associated Death Ratio by Residence County and Race/Ethnicity, Nevada, 2020

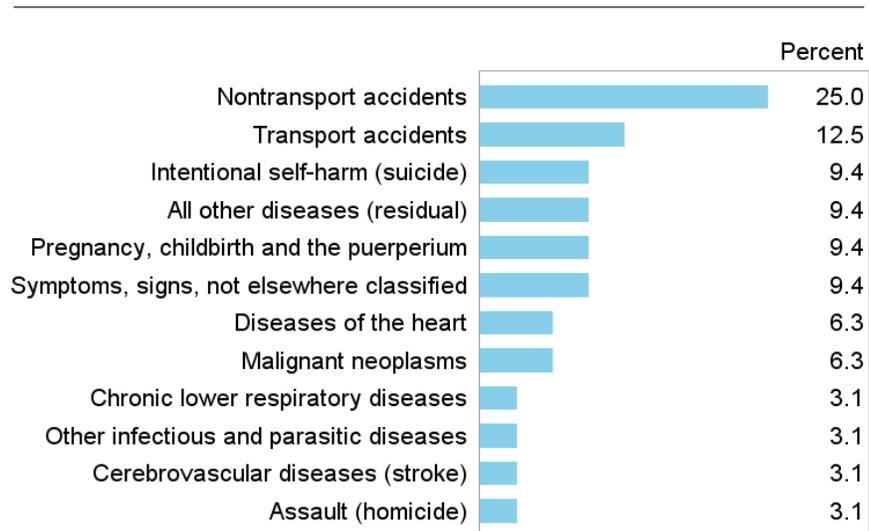


2020 data are preliminary and subject to changes.

Underlying Cause of Pregnancy-Associated Deaths

In 2020, the most common single death cause was nontransport accidents, accounting for 25.0% of all pregnancy-associated deaths. The second most common death cause was transport accidents, accounting for 12.5% of all deaths. All nontransport accidents deaths were due to unintentional drug overdose.

Figure 17. Underlying Causes of Death of Pregnancy-Associated Deaths Nevada, 2020

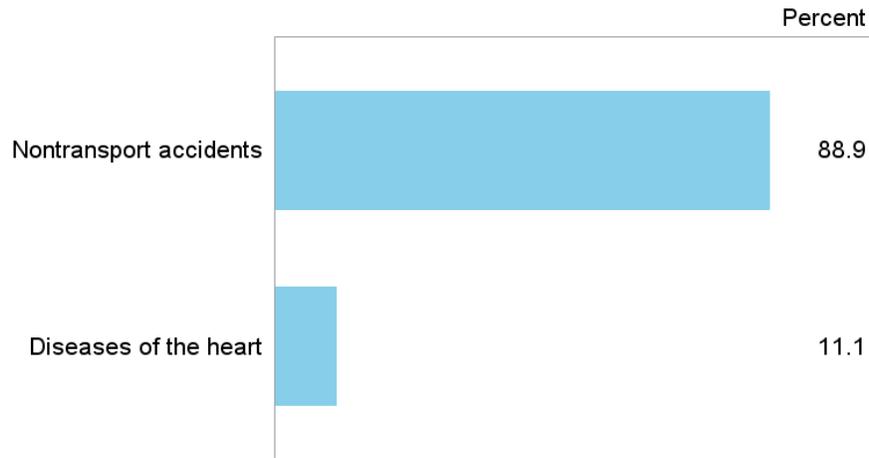


2020 data are preliminary and subject to changes.

Drug Overdose Deaths

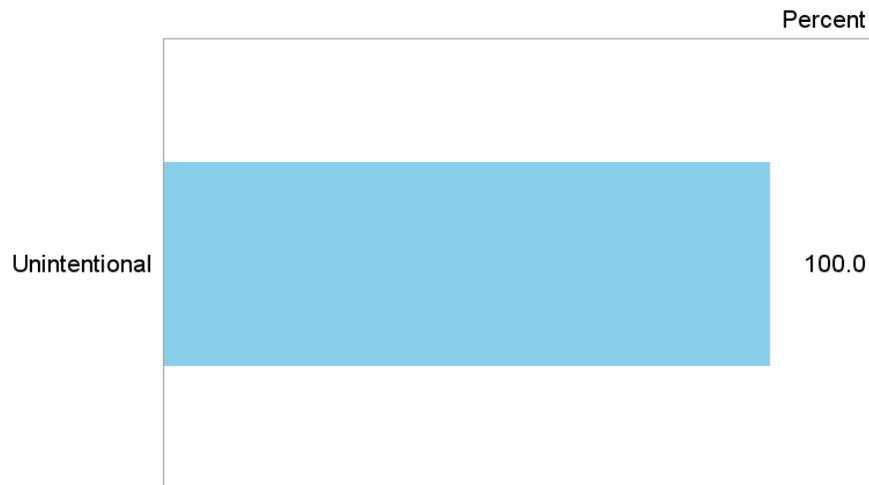
Drug overdose deaths were identified using underlying and contributing ICD-10 cause-of-death codes: X40-X44 (unintentional), X60-X64 (suicide), X85 (homicide), and Y10-Y14 (undetermined). Figure 18 shows 88.9% of drug overdose deaths had nontransport accidents as underlying death cause. Figure 19 shows that all drug overdose deaths were unintentional deaths.

Figure 18. Drug Overdose Deaths by Underlying Cause of Death, Nevada, 2020



Drug overdose deaths are identified using underlying and contributing ICD-10 cause-of-death codes: X40-X44(unintentional), X60-X64(suicide), X85(homicide), and Y10-Y14(undetermined). 2020 data are preliminary and subject to changes.

Figure 19. Drug Overdose Deaths by Intention, Nevada, 2020

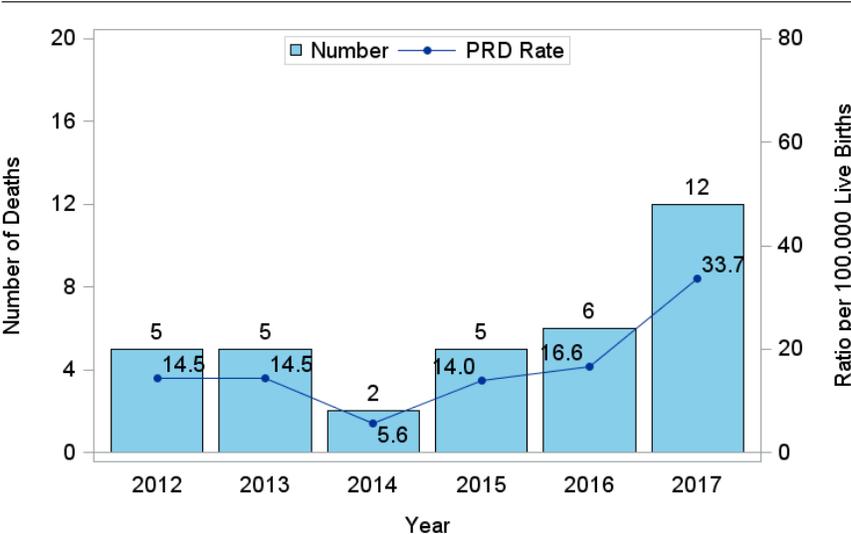


Drug overdose deaths are identified using underlying and contributing ICD-10 cause-of-death codes: X40-X44(unintentional), X60-X64(suicide), X85(homicide), and Y10-Y14(undetermined). 2020 data are preliminary and subject to changes.

Pregnancy-Related Deaths from Pregnancy Mortality Surveillance System (PMSS)

There were 35 pregnancy-related deaths for Nevada residents from 2012 to 2017 according to data from Pregnancy Mortality Surveillance System. There was no consistent increasing or decreasing trend in pregnancy-related death ratio, with the highest ratio in 2017, at 33.7 per 100,000 live births. There were 18 pregnancy-related deaths, with ratio at 25.1 per 100,000 live births from 2016 to 2017. The sections below explain the demographics and cause of death that associated with pregnancy-related deaths from 2016 to 2017.

Figure 20. Pregnancy-Related Death Ratio per 100,000 Live Births and Number of Deaths, Nevada, 2012 - 2017

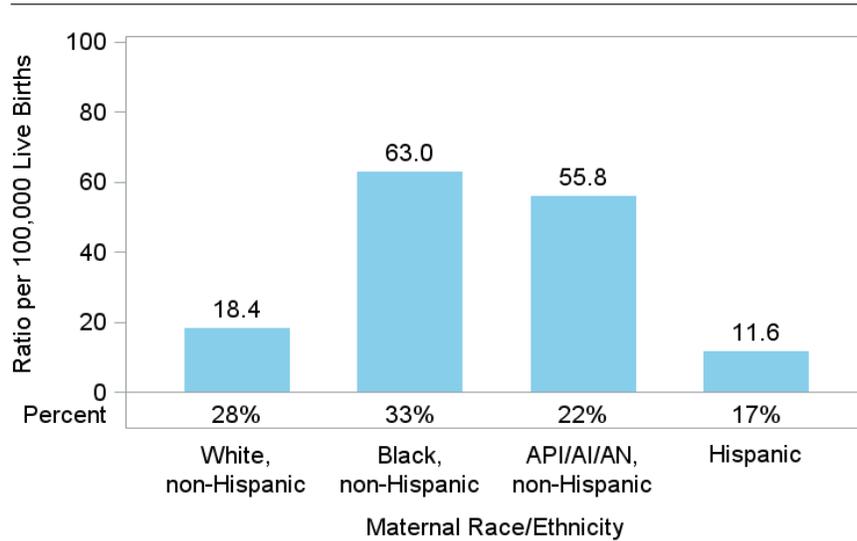


Data Source: Pregnancy Mortality Surveillance System (PMSS).

Demographics

Figure 21 shows that Black, non-Hispanic women had highest pregnancy-related death ratio at 63.0 per 100,000 live births and 33% of the pregnancy-related deaths occurred among Black, non-Hispanic women. Hispanic women had lowest death ratio at 11.6 per 100,000 live births, accounting for 17% of all deaths.

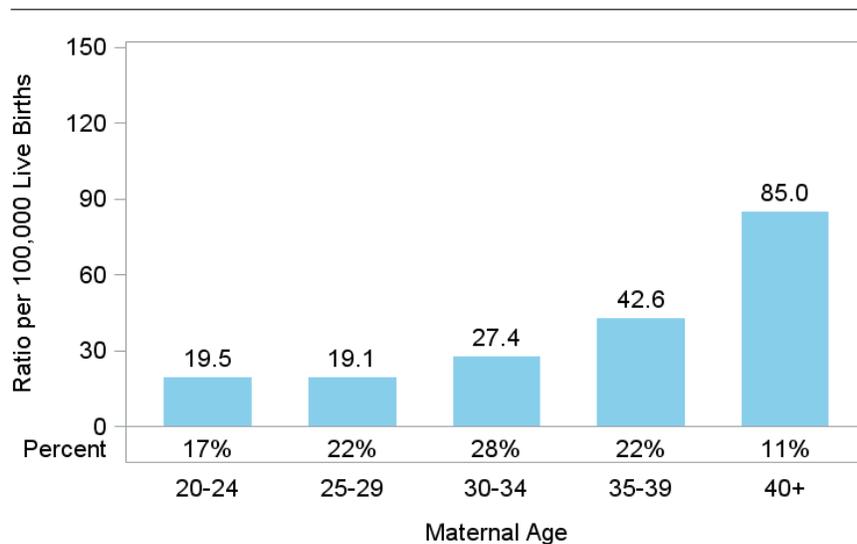
Figure 21. Pregnancy-Related Death Ratio and Percent by Race/Ethnicity Nevada, 2016 - 2017



Data Source: Pregnancy Mortality Surveillance System (PMSS).

In Figure 22, women aged 40 and older had the highest pregnancy-related death ratio at 85.0 per 100,000 live births, followed by women aged 35-39 at a ratio of 42.6 per 100,000 live births. Thirty-three percent of the deaths occurred among women aged 35 and older.

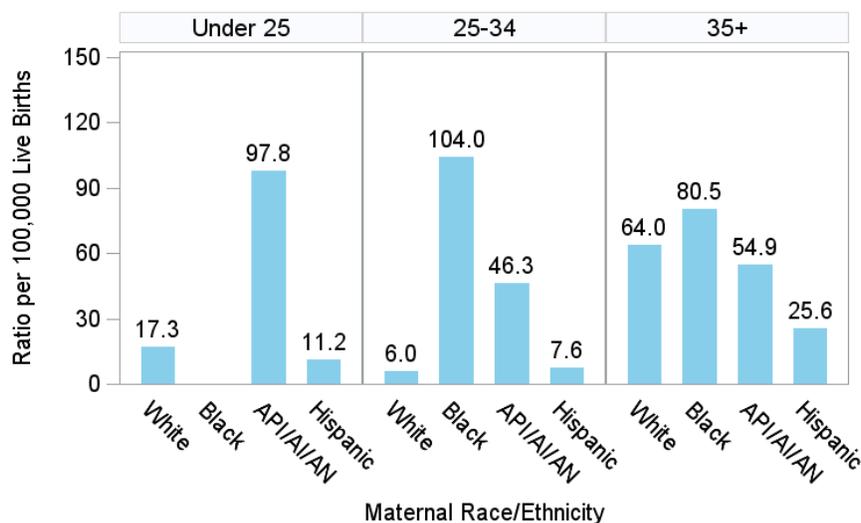
Figure 22. Pregnancy-Related Death Ratio and Percent by Maternal Age Nevada, 2016 - 2017



Data Source: Pregnancy Mortality Surveillance System (PMSS).

Figure 23 illustrates pregnancy-related death ratio for each race and ethnicity within age groups of under 25, 25-34, and 35 and older. For women aged 25 to 34, and 35 and older Black non-Hispanic had the highest death ratio, at 104.0 per 100,000 live births and 80.5 per 100,000 live births, respectively. For women 25 and under Asian/Pacific Islander/American Indian/American Native, non-Hispanic women had the highest death ratio at 97.8 per 100,000 live births.

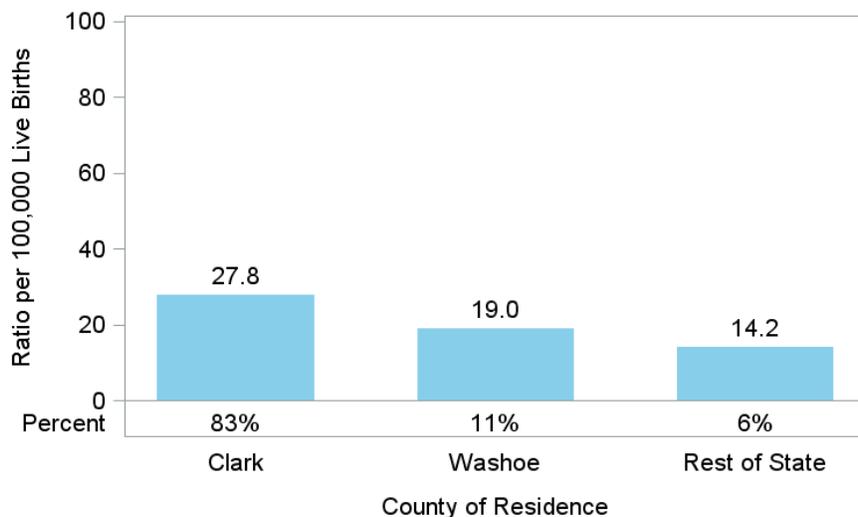
Figure 23. Pregnancy-Related Death Ratio by Maternal Age and Race/Ethnicity, Nevada, 2016 - 2017



Data Source: Pregnancy Mortality Surveillance System (PMSS).

Figure 24 shows that Clark County had the highest pregnancy-related death ratio at 27.8 per 100,000 live births, accounting for 83% of all pregnancy-related deaths.

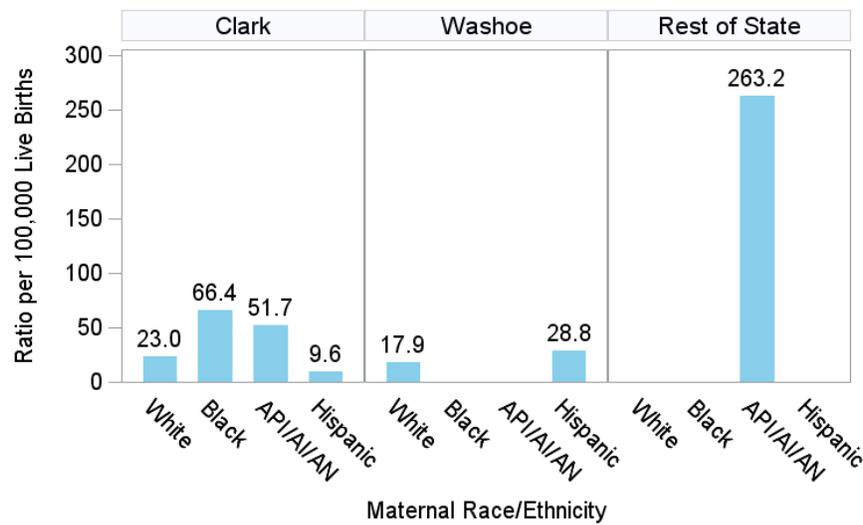
Figure 24. Pregnancy-Related Death Ratio by County of Residence Nevada, 2016 -2017



Data Source: Pregnancy Mortality Surveillance System (PMSS).

Figure 25 illustrates pregnancy-related death ratio for each race and ethnicity group within Clark County, Washoe County and Rest of State. In Clark County Black, non-Hispanic women had the highest ratio at 66.4 per 100,000 live births. While in Washoe County Hispanic women had the highest ratio at 28.8 per 100,000 live births. In Rest of State, Asian/Pacific Islander/American Indian/American Native, non-Hispanic women had the highest ratio at 263.2 per 100,000 live births.

Figure 25. Pregnancy-Related Death Ratio by Residence County and Race/Ethnicity, Nevada, 2020

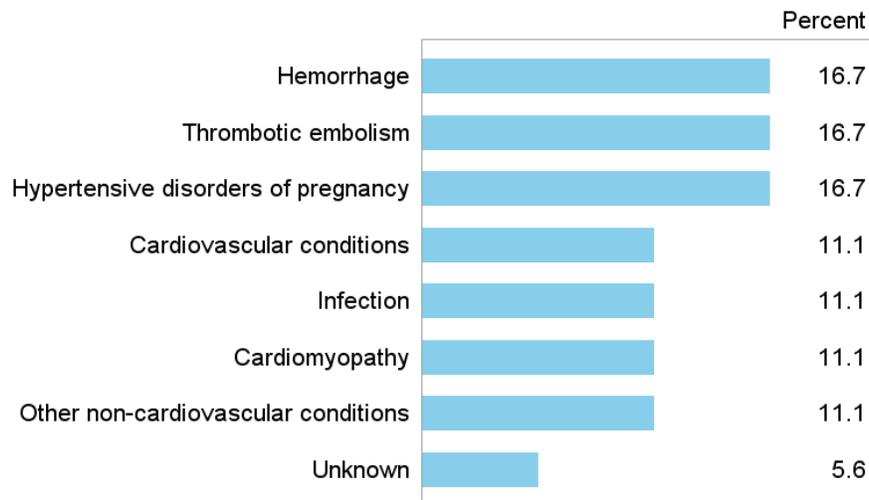


Data Source: Pregnancy Mortality Surveillance System (PMSS).

Cause of Pregnancy-Related Deaths

During 2016 and 2017, the most common death causes of pregnancy-related deaths were hemorrhage, thrombotic embolism, and hypertensive disorders of pregnancy, each accounting for 16.7% of all pregnancy-related deaths.

Figure 26. Cause of Death of Pregnancy-Related Deaths, Nevada, 2016 - 2017



Data Source: Pregnancy Mortality Surveillance System (PMSS).

References

1. Centers for Disease Control and Prevention (CDC). "Reference Guide for Pregnancy-Associated Death Identification."