

# The State of Maternal Health In Montana

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# Learning Objectives

1. Understand the importance of maternal health
2. Overview relevant maternal health initiatives in Montana
3. Evaluate the status of maternal health in Montana
4. Establish recommendations for maternal health care improvement in primary care settings



# Disclosures

- My work at the University of Montana Rural Institute for Inclusive Communities in maternal health is funded by grant partnerships with MT DPHHS using funding from the following federal programs:
  - HRSA-19-107 Maternal Health Innovation Program
  - CDC-RFA-DP19-1908 Enhancing Reviews and Surveillance to Eliminate Maternal Mortality
- As well through the following federal grants housed at UM:
  - CDC-RFA-DP22-2207 Perinatal Quality Collaborative
  - HRSA-23-066 Alliance on Innovation in Maternal Health
- The opinions expressed in this presentation are my own and do not represent the opinions or positions of MT DPHHS, HHS, or other grant funders / partner organizations.
- I do not have any conflicts of interest to disclose.



# Montana Maternal Health Initiatives

- **Montana Obstetrics and Maternal Support (MOMS) Program:** Funded by HRSA, administered by DPHHS (UM and Billings Clinic partners). Focuses on strengthening maternal health system, workforce development, data improvement, doula care
- **Montana Perinatal Quality Collaborative (MPQC):** Funded by CDC, administered by UM. Focuses on quality improvement in labor & delivery and has focuses on hemorrhage, hypertension, and sepsis.
- **Montana Alliance for Innovation in Maternal (AIM) Health Initiative:** Funded by HRSA, administered by UM. Focuses on quality improvement in hospital setting, including ED, in partnership with ACOG.
- **Montana Maternal Mortality Review Committee:** Funded by CDC, administered by DPHHS (UM partner). Conducts review of maternal deaths to develop preventability recommendations.
- Other expansive and important maternal health initiatives include **Meadowlark** (Montana Health Care Foundation and Medicaid), **Strengthening Families Initiative** (DPHHS) which are supporting perinatal behavioral health

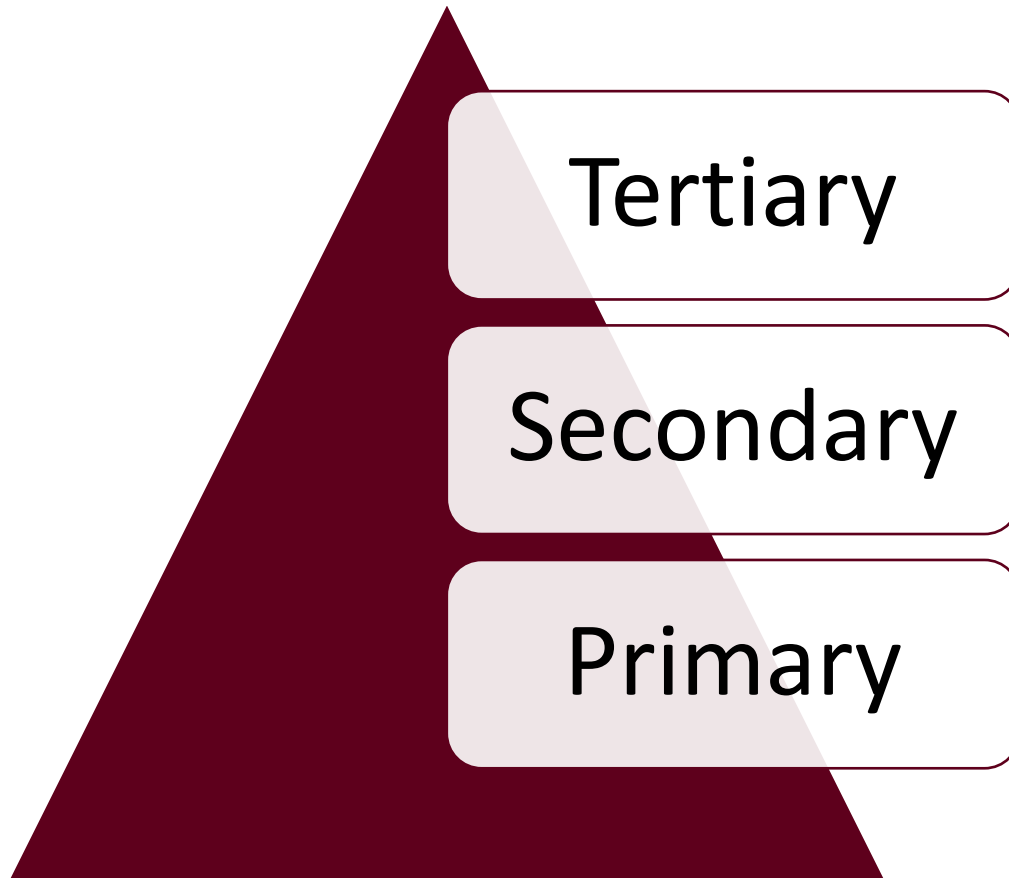
# Measuring Maternal Health

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Population-level data and  
mortality review

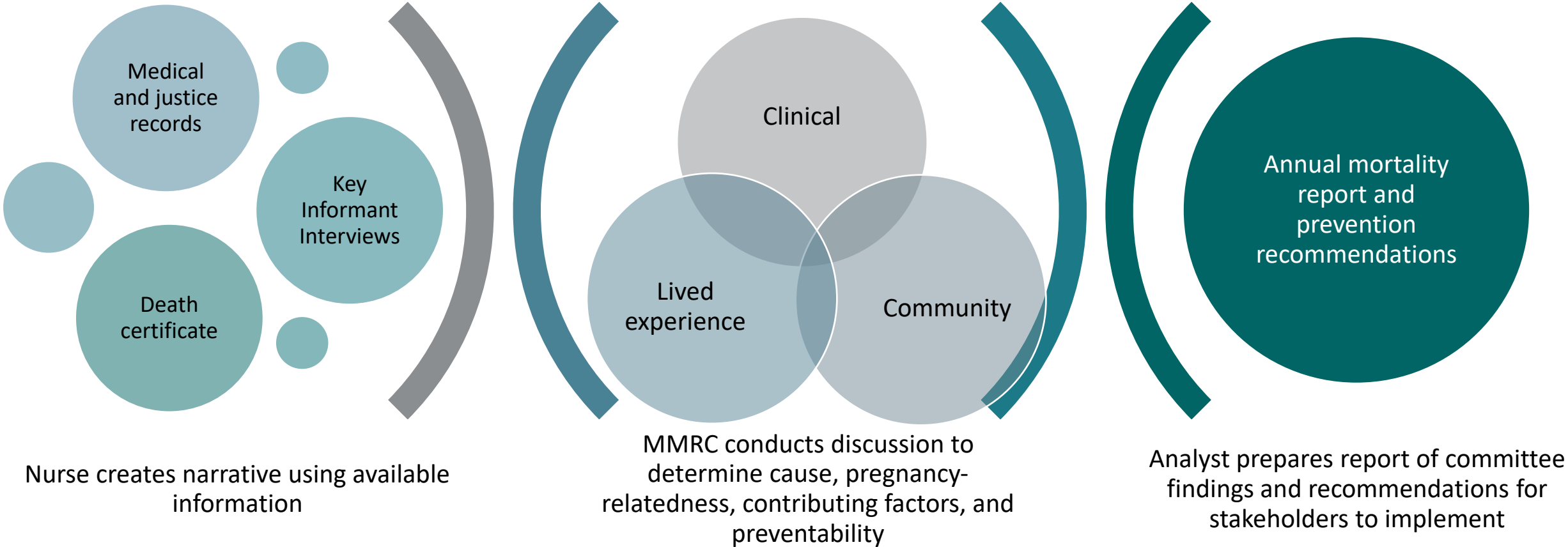


# Types of Maternal Health Data by Level of Prevention



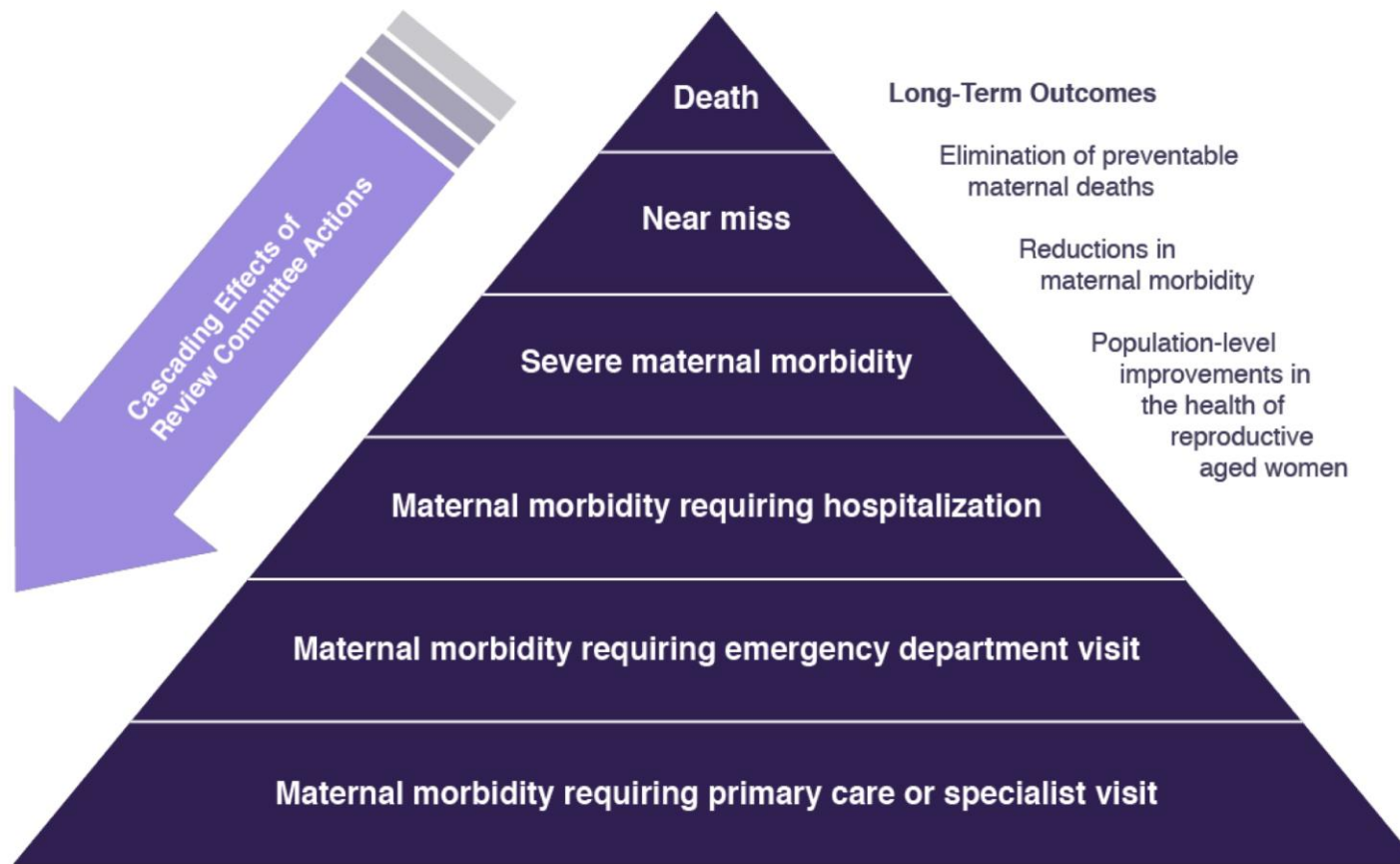
- Tertiary prevention: Preventing death
  - Data source: Maternal Mortality Review Committee
  - Indicator: Pregnancy-related deaths
- Secondary prevention: Preventing severe complications of pregnancy
  - Data source: Hospital Discharge Data System
  - Indicators: Severe maternal morbidity (SMM) and other complications at delivery
- Primary prevention: Preventing health problems that can complicate pregnancy
  - Data source: PRAMS
  - Indicators: Prenatal and postpartum care provision, health behaviors during pregnancy, postpartum depression

# Montana's MMRC: Investigating Circumstances Surrounding Death





# Maternal Mortality Review as Prevention



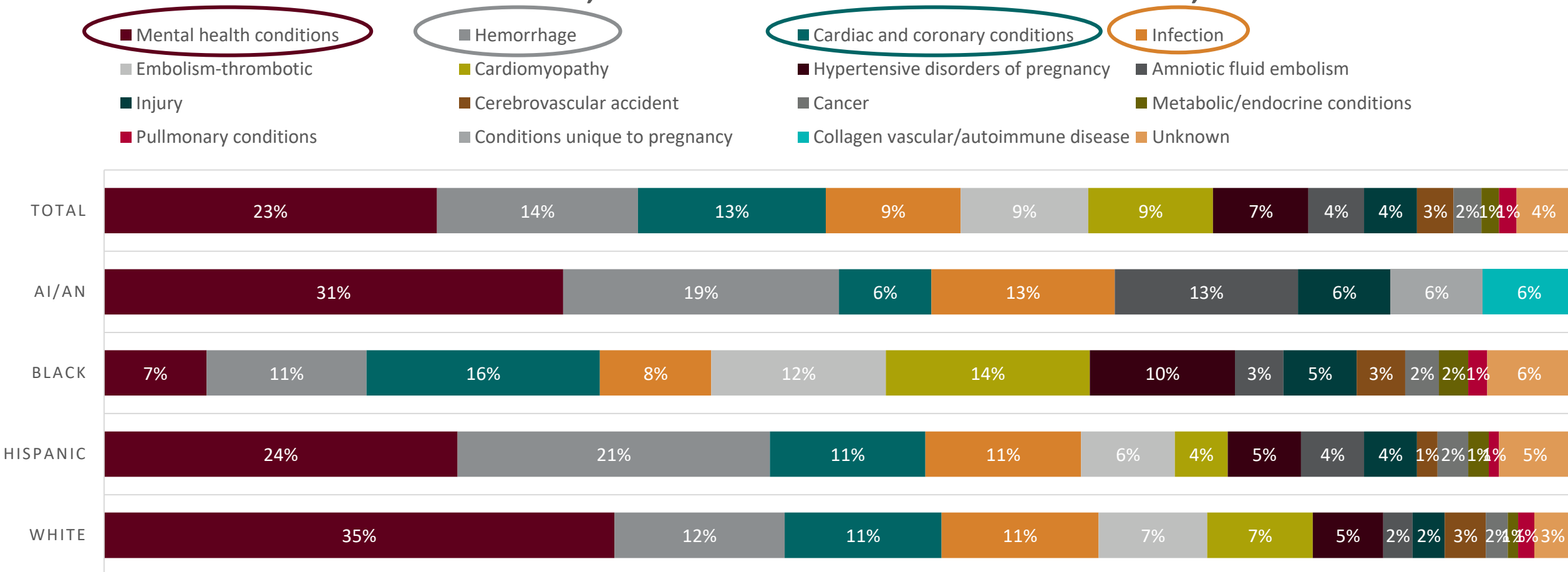
- Maternal deaths are statistically rare; nearly impossible to draw trends or look at subgroups in Montana
  - 10-20 people die each year in Montana during pregnancy or during the year postpartum; pregnancy-relatedness of these deaths determined by review
- Presenting relevant national data
- Death reviews provide rich, informative qualitative data
- In-depth understanding of circumstances surrounding a death can improve full health system



# Pregnancy-Related Deaths (MMRC)



## UNDERLYING CAUSES OF PREGNANCY-RELATED DEATHS, OVERALL AND BY RACE AND ETHNICITY, DATA FROM MMRC IN 36 US STATES, 2017-2019



# Pregnancy-Related Deaths (MMRC)

## DISTRIBUTION OF PREGNANCY-RELATED DEATHS BY TIMING OF DEATH IN RELATION TO PREGNANCY, MMRC DATA FROM 36 US STATES, 2017–2019

■ During pregnancy ■ Day of delivery ■ 1-6 days postpartum ■ 7-42 days postpartum ■ 43-365 days postpartum



Over half of deaths occur in later postpartum period.

# Mortality: Lessons for Primary Care

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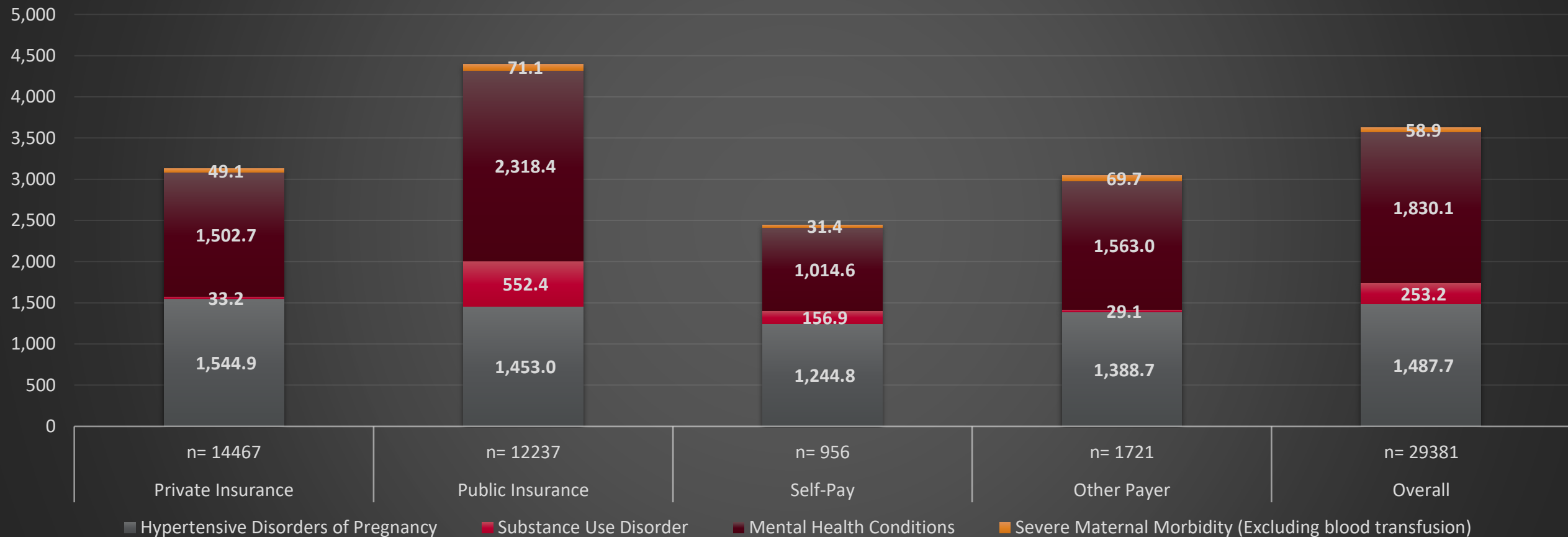
A third of pregnancy-related deaths are occurring **after patients have left perinatal provider** in the late postpartum period

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Deaths result from **causes best addressed by a strong primary care system**, such as behavioral health (substance use and mental illness), chronic disease (hypertension and cardiac conditions) and infection (i.e. community-acquired, loss to follow-up issues, immunizations)

# Pregnancy complications at delivery vary significantly by insurance coverage

Incidence of Select Complications of Pregnancy (per 10,000 hospitalized deliveries, 2020-2022) in Montana



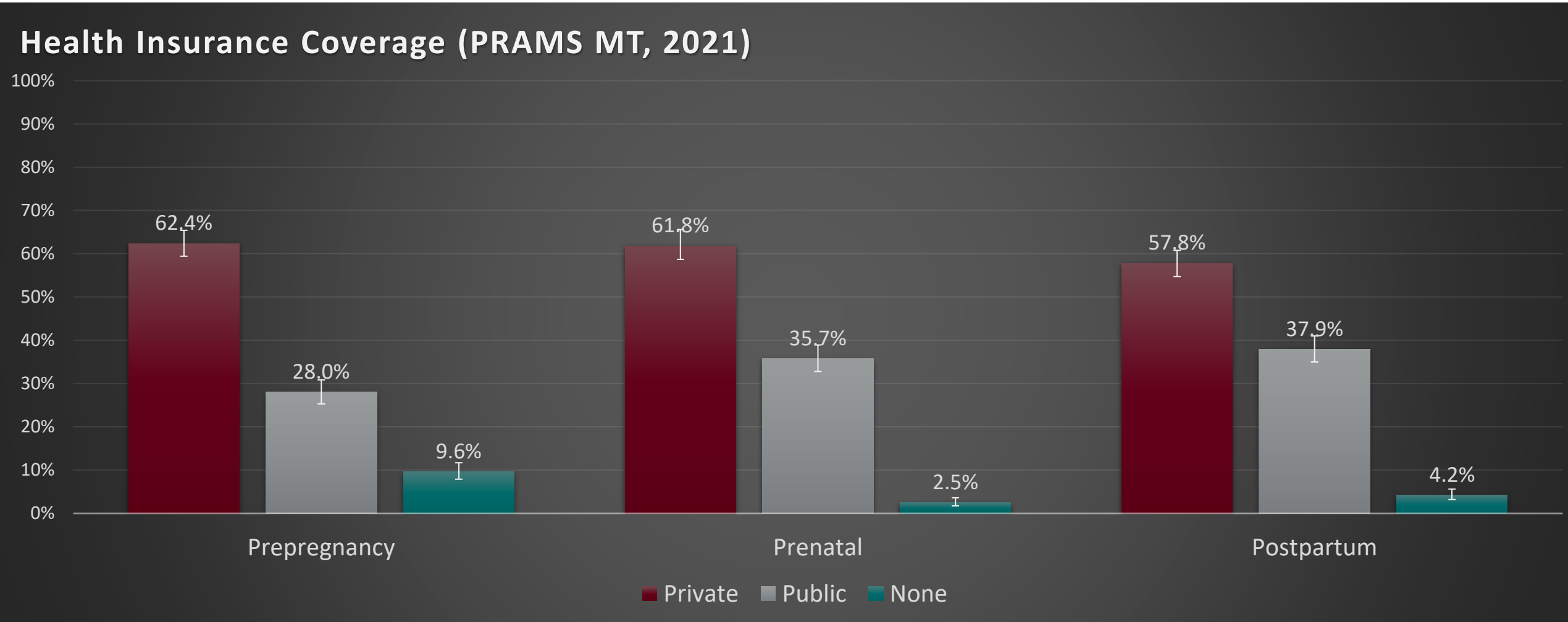


# Complications at Delivery: Lessons for Primary Care

Individuals with public insurance (Medicaid) are more vulnerable to mental illness, substance use disorder, and hypertension

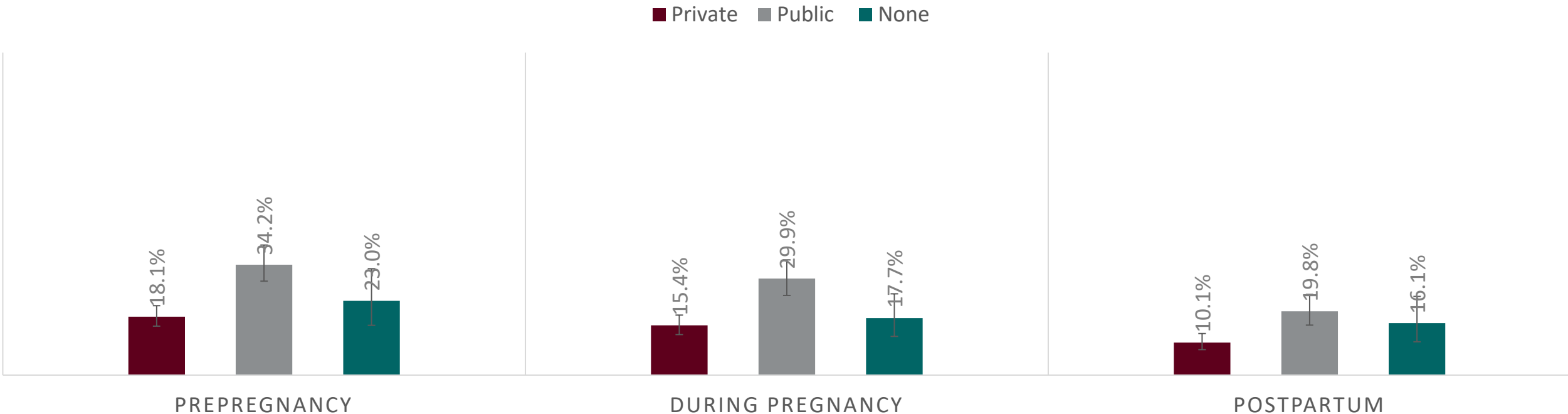
Medicaid patients especially need long-term primary care follow-up after delivery

# Proportion of pregnant people with health insurance coverage before, during, and after pregnancy



# Prevalence of self-reported peripartum depression in Montana

PREVALENCE OF DEPRESSION BEFORE, DURING, AND AFTER PREGNANCY BY PREPREGNANCY INSURANCE TYPE (PRAMS MT, 2021)



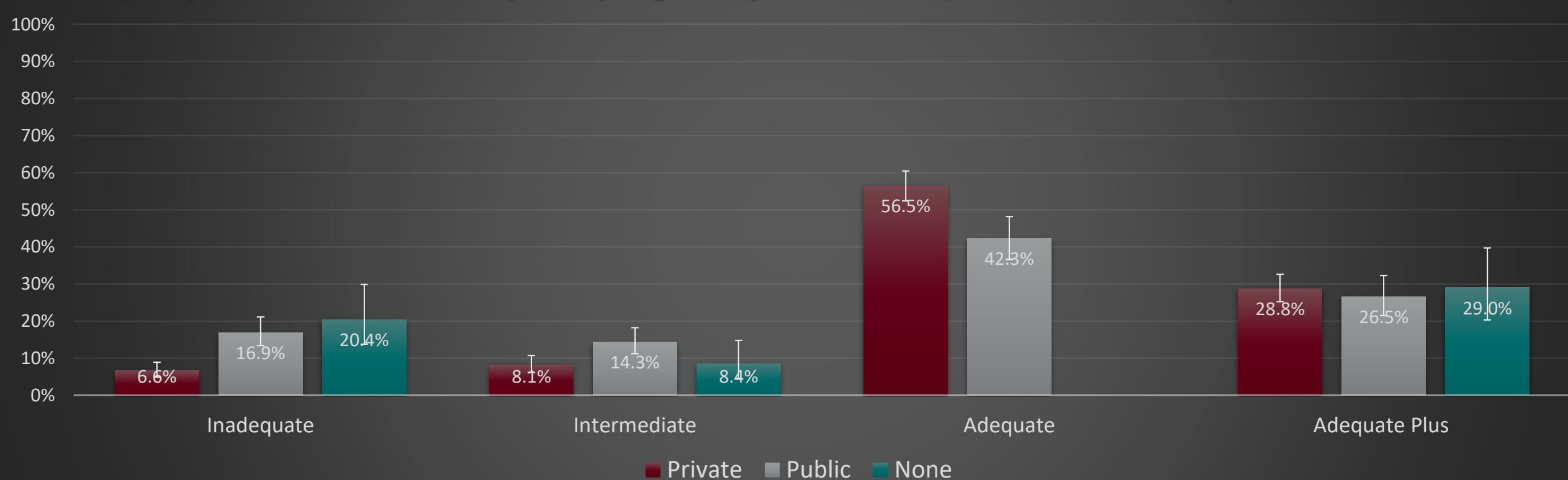
During the 3 months leading up to pregnancy, did you have depression?

During your most recent pregnancy, did you have depression?

Depressive symptoms ("always" or "often" feeling down, depressed, or hopeless or having little interest or little pleasure in doing things usually enjoyed) since delivering.

# Adequacy of prenatal care in Montana, using Kotelchuck Index

**Adequacy of Prenatal Care by Pre-pregnancy Insurance (PRAMS MT, 2021)**



The Kotelchuck Index assumes that the earlier prenatal care begins the better. To classify the adequacy of received services, the number of prenatal visits is compared to the expected number of visits for the period between when care began and the delivery date.

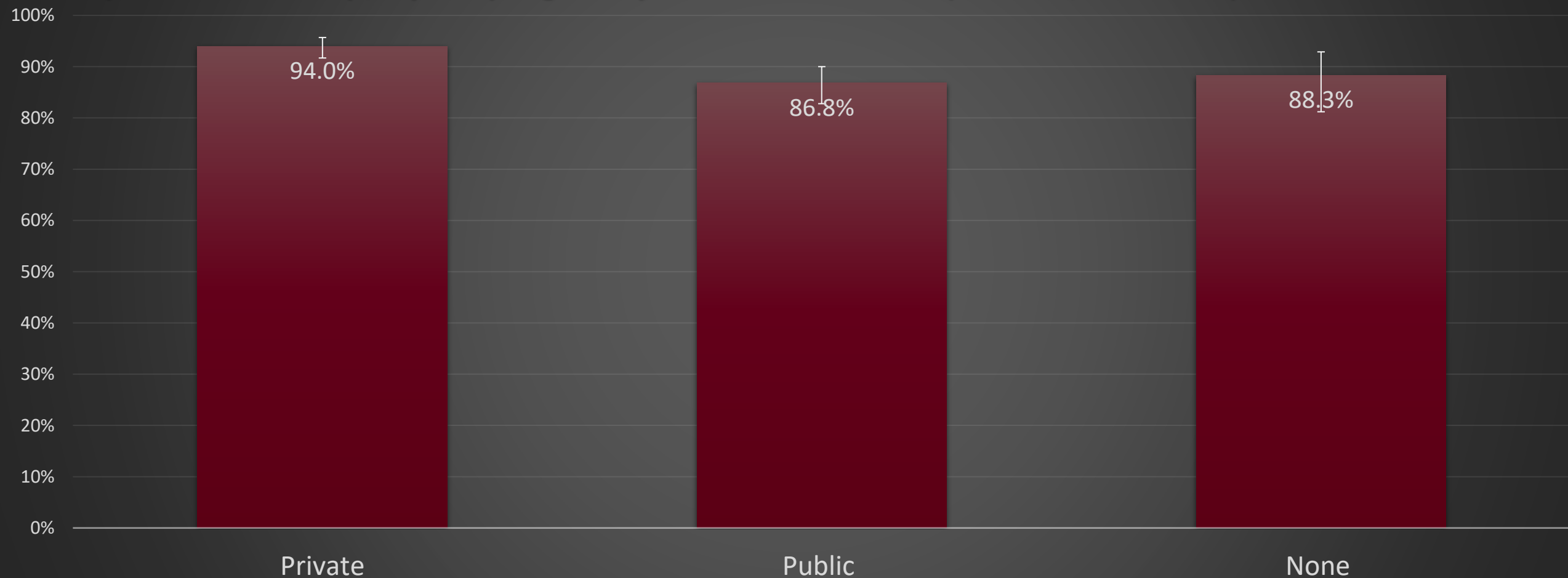
A ratio of observed to expected visits is calculated and grouped into four categories:

1. Inadequate (received less than 50% of expected visits),
2. Intermediate (50%-79%),
3. Adequate (80%-109%),
4. Adequate Plus (110% or more).



# Montanans reporting that they received a checkup since delivering their baby

**Postpartum Checkup, by Prepregnancy Health Insurance (PRAMS, MT 2021)**



# Primary Prevention: Lessons for Primary Care

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Prenatal and postpartum care in the perinatal health system provide an important intervention point for pregnant patients, but...

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We need to capitalize on this opportunity to establish stable insurance coverage and a relationship with a primary care provider to ensure long-term health benefits

A photograph of a woman lying in a hospital bed, looking up at a newborn baby who is crying. The woman has a nasal cannula. A hand in a blue glove is supporting the baby's head. The scene is set in a hospital room with blue patterned bedding.

# Conclusions

Putting data into action at the primary prevention level



# Primary Care and Maternal Health

- Insurance coverage should be understood as a proxy measure for socioeconomic status
  - People who have public insurance (Medicaid) are more vulnerable during pregnancy and need strong care systems
- Extending Medicaid to 12-months postpartum is a SIGNIFICANT opportunity to prevent pregnancy-related deaths
- Should use this extension to help postpartum people establish care with PCP



# Questions?

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# Rural Institute



## Appendix: ICD-10 Codes Used for Pregnancy Complications at Delivery: SUD

### Substance Use Disorder

#### Opioids

F1110, F1111, F11120, F11121, F11122, F11129, F1114, F11150, F11151, F11159, F11181, F11182, F11188, F1119, F1120, F1121, F11220, F11221, F11222, F11229, F1123, F1124, F11250, F11251, F11259, F11281, F11282, F11288, F1129, F1190, F11920, F11921, F11922, F11929, F1193, F1194, F11950, F11951, F11959, F11981, F11982, F11988, F1199

#### Sedatives

F1310, F1311, F13120, F13121, F13129, F1314, F13150, F13151, F13159, F13180, F13181, F13182, F13188, F1319, F1320, F1321, F13220, F13221, F13229, F13230, F13231, F13232, F13239, F1324, F13250, F13251, F13259, F1326, F1327, F13280, F13281, F13282, F13288, F1329, F1390, F13920, F13921, F13929, F13930, F13931, F13932, F13939, F1394, F13950, F13951, F13959, F1396, F1397, F13980, F13981, F13982, F13988, F1399

#### Cocaine

F1410, F1411, F14120, F14121, F14122, F14129, F1414, F14150, F14151, F14159, F14180, F14181, F14182, F14188, F1419, F1420, F1421, F14220, F14221, F14222, F14229, F1423, F1424, F14250, F14251, F14259, F14280, F14281, F14282, F14288, F1429, F1490, F14920, F14921, F14922, F14929, F1494, F14950, F14951, F14959, F14980, F14981, F14982, F14988, F1499

#### Amphetamines/Stimulants

F1510, F1511, F15120, F15121, F15122, F15129, F1514, F15150, F15151, F15159, F15180, F15181, F15182, F15188, F1519, F1520, F1521, F15220, F15221, F15222, F15229, F1523, F1524, F15250, F15251, F15259, F15280, F15281, F15282, F15288, F1529, F1590, F15920, F15921, F15922, F15929, F1593, F1594, F15950, F15951, F15959, F15980, F15981, F15982, F15988, F1599

Appendix: ICD-10 Codes Used for Pregnancy Complications at Delivery: Mental Health

Mental Health Condition	Depression	F320, F321, F322, F323, F324, F325, F328, F3289, F329, F32A, F330, F331, F332, F333, F334, F3340, F3341, F3342, F338, F339, F341, F530, O906, O9934
	Bipolar disorder	F3010, F3011, F3012, F3013, F302, F303, F304, F308, F309, F310, F3110, F3111, F3112, F3113, F312, F3130, F3131, F3132, F314, F315, F3160, F3161, F3162, F3163, F3164, F3170, F3171, F3172, F3173, F3174, F3175, F3176, F3177, F3178, F3181, F3189, F319, F340, F3481, F3489, F39
	Anxiety	F064, F409, F4000, F4001, F4002, F4010, F4011, F40218, F40240, F40241, F408, F410, F411, F413, F418, F419, F430, F458, F488, F489, F938, F99, R457
	Posttraumatic stress disorder	F4310, F4311, F4312
	Obsessive-compulsive disorder	F422, F423, F424, F428, F429, R4681
	Psychosis	F060, F062, F200, F201, F202, F203, F205, F2081, F2089, F209, F21, F22, F23, F24, F250, F251, F258, F259, F28, F29, F531, F440, F441, F442, F4481, F4489, F449, F481, F482
	Other	R45850, R45851, F061, F0630, F0631, F0632, F0633, F0634, F349, F4320, F4321, F4322, F4323, F4324, F4325, F4329, F4381, F4389, F439, F444, F445, F446, F447, F450, F451, F4520, F4521, F4522, F4529, F4541, F4542, F458, F459, F5101, F5102, F5103, F5104, F5105, F5109, F5111, F5112, F5113, F5119, F518, F519, F54, F59, O99340, O99341, O99342, O99343, O99344, O99345

Appendix: ICD-10 Codes Used for Pregnancy Complications at Delivery: Hypertension

<b>Hypertensive Disorder in Pregnancy</b>	Chronic hypertension	O100, O101, O102, O103, O109, O104, I10, I11, I12, I13, I15
	Pregnancy-associated hypertension	O11
	Preeclampsia	O14
	Eclampsia	O15
	Gestational hypertension	O13
	Unspecified maternal hypertension	O16

HDP based on published work Ford, et al. 2022



## Appendix: ICD-10 Codes Used for Pregnancy Complications at Delivery: Severe Maternal Morbidity

### Severe Maternal Morbidity

Acute myocardial infarction	I21.xx, I22.x
Aneurysm	I71.xx, I79.0
Acute renal failure	N17.x, O90.4
Adult respiratory distress syndrome	J80, J95.1, J95.2, J95.3, J95.82x, J96.0x, J96.2x, J96.9x, R06.03, R09.2
Amniotic fluid embolism	O88.112, O88.113, O88.119, O88.12, O88.13
Cardiac arrest / ventricular fibrillation	I46.x, I49.0x
Conversion of cardiac rhythm	5A2204Z, 5A12012
Disseminated intravascular coagulation	D65, D68.8, D68.9, O45.002, O45.003, O45.009, O45.012, O45.013, O45.019, O45.022, O45.023, O45.029, O45.092, O45.093, O45.099, O46.002, O46.003, O46.009, O46.012, O46.013, O46.019, O46.022, O46.023, O46.029, O46.092, O46.093, O46.099, O67.0, O72.3
Eclampsia	O15.x
Heart failure / arrest during surgery or procedure	I97.12x, I97.13x, I97.711
Puerperal cerebrovascular disorders	A81.2, G45.x, G46.x, G93.49, H34.0x, I60.xx, I61.xx, I62.xx, I63.xx, I65.xx, I66.xx, I67.xx, I68.xx, O22.50, O22.52, O22.53, I97.81x, I97.82x, O87.3
Pulmonary edema/acute heart failure	J81.0, I50.1, I50.20, I50.21, I50.23, I50.30, I50.31, I50.33, I50.40, I50.41, I50.43, I50.810, I50.811, I50.813, I50.814, I50.82, I50.83, I50.84, I50.89, I50.9
Severe anesthesia complications	O29.112, O29.113, O29.119, O29.122, O29.123, O29.129, O29.192, O29.193, O29.199, O29.212, O29.213, O29.219, O29.292, O29.293, O29.299, O74.0, O74.1, O74.2, O74.3, O89.0x, O89.1, O89.2, T88.2XXA, T88.3XXA
Sepsis	O85, R65.21, R65.20, T81.44XA, T81.12XA, I76, O86.04, A40.x, A41.x, A32.7
Shock	O75.1, R57.x, T78.2XXA, T88.6XXA, T81.10XA, T81.11XA, T81.19XA
Sickle cell disease with crisis	D57.0x, D57.21x, D57.41x, D57.81x
Air and thrombotic embolism	I26.01, I26.02, I26.09, I26.90, I26.92, I26.93, I26.94, I26.99, O88.012, O88.013, O88.019, O88.02, O88.03, O88.212, O88.213, O88.219, O88.22, O88.23, O88.312, O88.313, O88.319, O88.32, O88.33, O88.812, O88.813, O88.819, O88.82, 88.83, T80.0XXA
Hysterectomy	OUT90ZZ, OUT97ZL, OUT97ZZ, OUT90ZL
Temporary tracheostomy	0B110F4, 0B113F4, 0B114F4
Ventilation	5A1935Z, 5A1945Z, 5A1955Z

SMM based on AIM/CDC definitions, 2023

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