Investigating Maternal Mortality in Washington State

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Washington State Department of Health

In collaboration with the Center of Excellence in Maternal and Child Health (MCH) and the MCH Consortium at the University of Washington
Presentation Overview

Learn more about the Maternal Mortality Review Panel (MMRP), the law that directs it, and a summary of the review process

Learn about the results of the review of 2014–2015 maternal deaths in Washington State

Learn about the review findings and summary of the recommendations made by the MMRP

Learn more about our next steps and activities
Questions for the Viewer

*Does your agency have a formal mortality review process?*

(select all that apply)

A. Yes—for maternal deaths
B. Yes—for child deaths
C. Yes—for suicides
D. Yes—for something else (*explain in chat*)
E. No
F. I don’t know
Background and Methods
Background

U.S. rates of maternal mortality are among the highest of all developed nations (Singh 2010)

- Women of color from low-income backgrounds and rural areas most affected

Rates have been rising since the 1980s (CDC 2016)

- Rise in chronic disease, mental illness
- Changes in mortality surveillance
- Health inequalities that affect maternal outcomes

Maternal death is a rare event, but...

- Quality indicator of maternal/women’s healthcare
- For every maternal death, 50 or more women in the U.S. are affected by severe maternal morbidity (Callaghan et al. 2007)

Washington State Department of Health

Washington State Department of Health Maternal Mortality Review

**Clinical champions, stakeholders - ESSB 6534 in 2016**
- Informal process in Washington State since the 1990s
- Limited information unable to make recommendations on prevention

**Maternal Mortality Review Panel Law (RCW 70.54.450)**
- Understand maternal mortality in the state
- Make recommendations to prevent future deaths
- Provides authorities and protections

**Panel**
- 60+ multidisciplinary and diverse women’s healthcare and service providers from around the state

**Product**
- Report of findings and recommendations to legislators every two years

Washington State Department of Health

Multi-Level Review Process

Level 1 Review: Maternal Death Identification

Level 2 Review: Maternal Death Categorization

Level 3 Review: Pregnancy-related Death Review and Preventability Discussion

Level 4 Review: Systems-level Recommendation Development

Washington State Department of Health
Maternal Death: The death of a woman during pregnancy or within one year of the end of pregnancy from any cause*

*This term is synonymous with pregnancy-associated death

Key Definitions

Pregnancy-Associated, Not Related Death: The death of a woman from any cause during pregnancy or within one year of the end of pregnancy that is not pregnancy-related

Pregnancy-Related Death: 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

Unable to be determined: Unable to determine if a maternal death is pregnancy-related or pregnancy-associated, not related
Results
Maternal Mortality Review:
Review of 2014–2015 Maternal Deaths
Washington State Department of Health

Maternal Mortality and Pregnancy-Related Mortality Rates


*Purple lines indicate change in data set

*1990-2008 Review limited to birth, death, and hospitalization records; 2009-2012 Review is limited to birth and death records and shows the maximum rate; No Review of data for 2013; 2014-2015 Review based on birth, death, hospitalization, medical records, autopsies, and other available records.

Washington State Department of Health
Washington State Department of Health

United States
- 700 pregnancy-related deaths per year\(^1\)
- 17 pregnancy-related deaths/100,000 live births\(^1\)
- Among the highest of all developed nations\(^2\)

Washington
- 30 maternal deaths per year
- 9 pregnancy-related deaths/100,000 live births
- Ranks 17\(^{th}\) in nation
- Still higher than most developed nations\(^3\)

Washington State Department of Health

\(^1\) CDC 2016  \(^2\) Singh 2010  \(^3\) CIA 2018
# Maternal Death and Rates/Ratios

## 2014–2015, Washington State

<table>
<thead>
<tr>
<th></th>
<th>2014 Deaths</th>
<th>2015 Deaths</th>
<th>2014–2015 Total Deaths</th>
<th>2014/2015 Ratio ¹</th>
<th>95%CI ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total maternal deaths</td>
<td>38</td>
<td>31</td>
<td>69</td>
<td>38.9</td>
<td>(30.2, 49.2)</td>
</tr>
<tr>
<td>Pregnancy-related deaths</td>
<td>9</td>
<td>7</td>
<td>16</td>
<td>9.0</td>
<td>(5.2, 14.6)</td>
</tr>
<tr>
<td>Pregnancy-associated deaths</td>
<td>29</td>
<td>24</td>
<td>53</td>
<td>29.8</td>
<td>(22.4, 39.0)</td>
</tr>
<tr>
<td>Live Births</td>
<td>88,561</td>
<td>89,000</td>
<td>177,561</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ *Ratio per 100,000 live births*

² *95% confidence interval*
Pregnancy-Associated (Not-Related) Deaths: Causes of Death

2014–2015, Washington State

- Natural causes of death
- Unintentional injuries
- Intentional injuries

- Other unintentional injury: 2%
- Manner of injury could not be determined: 2%
- Cancer: 15%
- Accidental Overdose: 19%
- Cardiac: 7%
- Seizure: 8%
- Suicide: 11%
- Homicide: 11%
- Motor Vehicle Accident: 23%
- Other natural cause: 2%
Pregnancy-Related Deaths: Causes of Death

2014–2015, Washington State

- Hemorrhage: 31%
- Hypertensive disorders of pregnancy: 19%
- Amniotic fluid embolism: 13%
- Ectopic pregnancy: 13%
- Infection/sepsis: 6%
- Cancer: 6%
- Other/unknown: 13%
Preventability of Pregnancy-Related Maternal Deaths

Cause of Death Determined by MMRP — 2014–2015, Washington State

- **Unable to Determine if Preventable**
  - 0
  - 2

- **Not Preventable Deaths**
  - Hemorrhage: 4
  - Hypertensive Disorders of Pregnancy: 2
  - Amniotic Fluid Embolism: 1
  - Ectopic Pregnancy: 0
  - Infection/Sepsis: 2
  - Non-Cardio vascular Diseases: 0

- **Preventable Deaths**
  - Hemorrhage: 7
  - Hypertensive Disorders of Pregnancy: 5
  - Amniotic Fluid Embolism: 2
  - Ectopic Pregnancy: 1
  - Infection/Sepsis: 0
  - Non-Cardio vascular Diseases: 0
## Maternal Deaths: Pre-Pregnancy Weight (BMI)

### 2014–2015, Washington State

<table>
<thead>
<tr>
<th>Category</th>
<th>Underweight</th>
<th>Normal</th>
<th>Overweight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pregnancy Associated Deaths</strong></td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pregnancy Related Deaths</strong></td>
<td>10%</td>
<td></td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total Live Births 2014-2015</strong></td>
<td>2%</td>
<td>10%</td>
<td>60%</td>
</tr>
</tbody>
</table>

- **Underweight**: BMI < 18.5
- **Normal**: BMI 18.5 - 24.9
- **Overweight**: BMI 25.0 - 29.9
- **Obese Class I (30-34.9)**: BMI 30.0 - 34.9
- **Obese Class II (35-39.9)**: BMI 35.0 - 39.9
- **Obese Class III (>40)**: BMI > 40

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Comparing Pregnancy-Related Deaths, Suicide and Overdose Deaths

2014–2015, Washington State

- Total Pregnancy-Related Deaths: 16
- Sepsis: 1
- Ectopic Pregnancy: 2
- Amniotic Fluid Embolism: 4
- Hypertensive Disorders in Pregnancy: 6
- Non-cardiovascular: 8
- Hemorrhage: 10
- Total Suicide and Overdose Deaths: 15
- Accidental Overdose: 8
- Suicide: 7

Number of Deaths
Maternal Deaths: Pregnancy Status at Time of Death

2014–2015, Washington State

<table>
<thead>
<tr>
<th>Pregnancy Associated Deaths</th>
<th>Pregnancy Related Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant at time of death</td>
<td>&lt;= 7 days</td>
</tr>
<tr>
<td>22-28 days</td>
<td>2-28 days</td>
</tr>
<tr>
<td>26-42 days</td>
<td>26-42 days</td>
</tr>
<tr>
<td>43-90 days</td>
<td>43-90 days</td>
</tr>
<tr>
<td>91-180 days</td>
<td>91-180 days</td>
</tr>
<tr>
<td>181-270 days</td>
<td>181-270 days</td>
</tr>
<tr>
<td>271-365 days</td>
<td>271-365 days</td>
</tr>
</tbody>
</table>
Maternal Deaths: Age at Time of Death

2014–2015, Washington State

Percent of total deaths or live births

- Pregnancy Associated
- Pregnancy Related
- Total Live Births 2014-2015

- Under 20 yo
- 20-29 yo
- 30-39 yo
- 40 yo +
Maternal Mortality: Ratios of Race/Ethnicity

### Maternal Mortality Ratio 2005-2014

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NH-Black</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>NH-Asian</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>NH-American Indian/Alaska Native</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>NH-Hawaiian/Pacific Islander</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Multiple Race</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**2014–2015, Washington State**
Maternal Deaths: Education Level

2014–2015, Washington State

Percent of total deaths or live births

- Pregnancy Associated
- Pregnancy Related
- Total Live Births

Education Levels:
- 12th grade or less, no diploma
- High School / GED Complete
- Some college or degree
- Not specified

Washington State Department of Health
Pregnancy-Related Deaths: Healthcare Coverage Type

2014–2015, Washington State

Percent of total deaths

- Medicaid
- Other Payor (Includes private insurance and DoD)
Contributing Factors, Key Issues, and Recommendations

Washington State Department of Health
Pregnancy-Related Deaths: Contributing Factors

2014–2015, Washington State

Patient Level

- Personal/religious beliefs
- Lifestyle choices
- Social support
- Comorbidities and chronic disease
- Basic needs

Provider Level

- Delays in care, diagnosis, treatment, intervention
- Medication management, dosage
- Social biases, discrimination

Washington State Department of Health
Pregnancy-Related Deaths: **Contributing Factors**

2014–2015, Washington State

**Facility Level**
- Standardized protocols for maternal emergencies, care
- Language services
- Facility capacity for maternal care

**Systems Level**
- Information sharing
- Delayed transfers
- Difficulty identifying pregnant/postpartum women
- Access to in-home nurse visits
- Autopsy variation

Washington State Department of Health
2014–2015 Maternal Mortality: Key Issues

Obesity

- 94% (n=15 deaths) of the women were overweight or obese
- 31% (n=5 deaths) of the women had a BMI greater than 40
- Considered a contributing factor to 5 of the pregnancy-related deaths

Mental Health

Substance use and mental health issues present in 25% of all maternal deaths
2014–2015 Maternal Mortality: **Key Issues**

**Postpartum Follow Up Care and Services**

Most pregnancy-related deaths occurred within the first seven days after the end of the pregnancy

**Death Investigation/Autopsies**

Fewer than half of pregnancy-related deaths received autopsy
2014–2015 Maternal Mortality: **Key Issues**

Disparities

- Race/Ethnicity
- Income
- Education
- Bias/Racism
Recommendations to Reduce Maternal Mortality

2014–2015, Washington State

Improve care for women with high Body Mass Index

Promote standardized protocols for ectopic pregnancy

Develop best practices for care of women with high BMI during pregnancy, postpartum
Recommendations to Reduce Maternal Mortality

2014–2015, Washington State

Expand healthcare coverage for all women:
- Expand Medicaid to comprehensive coverage first year post-pregnancy
- Continue expanded access to insurance coverage through state and national reform

Improve access to mental health services:
- Tailor mental health treatment services to pregnant women and mothers
- Postpartum depression screenings by newborn providers during well-child visits
Recommendations to Reduce Maternal Mortality

2014–2015, Washington State

Improve postpartum follow-up care

- Telephone call to check in on mom 24-48 hours postpartum
- 24-hour check-in plan for mom for first few weeks postpartum
- In-home nurse visit within first week postpartum

Other examples:
- Recommendations for Postpartum Care Toolkits (WSHA)
- Blue Band Initiative to prevent preeclampsia (Evergreen, Virginia Mason Yakima)
- Implementation of safety bundles like those from AIM, and CMQCC
Recommendations to Reduce Maternal Mortality

Washington State, 2014–2015 Deaths

**Improve health equity and address social determinants of health**
- Integrate frameworks for social determinants of health into quality improvement strategies
- [WA DOH Health Equity Webpage](#)
- [San Francisco State University Health Equity Institute](#)
- Adopt strategies to address social biases in healthcare

**Improve death investigation and autopsy**
- Require pregnancy-related deaths to be reported to local coroner for investigation and autopsy
- Develop guidelines for pregnancy-related death autopsy and investigation
## Recommendation to Action: Washington State Perinatal Collective

<table>
<thead>
<tr>
<th>Category</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Mental Health                                 | ✓ Group prenatal care  
✓ Family-friendly residential settings  
✓ PPD screening reimbursement at WCC                                                |
| Death Investigation                           | ✓ Changes to legislation  
✓ Required reporting, autopsy                                                      |
| Obesity                                       | ✓ Working on best practices/guidelines for care; QI to roll out                   |
| Improving Maternal Follow Up Care            | ✓ Promoting in-home nurse visits  
✓ Preeclampsia - Schedule guidelines for follow up care                           |
Next Steps…

- Increase awareness about maternal mortality in our state
- Collaborate with CDC and other state programs to standardize review process
- Collaborate with key partners and stakeholders to increase awareness of and translate recommendations into actions
- Begin the review of 2016 maternal deaths
What Can We Do?

- Address social determinants, including access to:
  - Education
  - Healthcare
  - Housing
  - Healthy food

- Address health equity, including barriers based on:
  - Cost
  - Transportation
  - Knowledge
  - Providers

- Consider related data and findings. How can you apply the recommendations to your own work?
Questions for the Viewer

Which social determinant(s) of health does your agency address?

(choose all that apply, and briefly summarize your approach in chat)

A. Education
B. Health care
C. Housing
D. Healthy food
Which health equity factors does your agency address?

(choose all that apply, and briefly summarize your approach in chat)

A. Cost
B. Transportation
C. Knowledge
D. Providers
Questions?
Maternal Mortality Review at DOH: Contact Information

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For additional information, and to view a copy of the Maternal Mortality Review report, visit bit.ly/2KTqq2p
References


California Maternal Quality Care Collaborative
Alliance for Innovation on Maternal Health
CDC – Pregnancy Mortality Surveillance System
CDC – Pregnancy-related Deaths
Review to Action
Health Equity Institute
ACOG – Screening for Perinatal Depression