Mortality Data Release: Maternal Mortality Highlight

Amy Branum, Ph.D.

January 30, 2020
National Center for Health Statistics (NCHS): What We Do

- Monitor the nation’s health by collecting, analyzing, and disseminating health data to:
  - Compare across time, populations, providers, & geographic areas
  - Identify health problems, risk factors, & disease patterns
  - Inform actions & policies to improve the health of the American people
  - Administer cross-cutting, comprehensive, & foundational data collections that address the full range of public health issues including emerging concerns

- As the designated Federal statistical agency for health, NCHS provides data that are unavailable elsewhere for informed decision-making
Data Systems

National Vital Statistics System

National Health Interview Survey

National Health and Nutrition Examination Survey

National Health Care Surveys
National Vital Statistics System (NVSS) and the Vital Statistics Cooperative Program (VSCP)

- States register all births and deaths
- NCHS receives vital records from jurisdictions on birth, death, and fetal death
- Federal-State contractual arrangement
  - 50 States, New York City, District of Columbia and 5 US territories
  - Federal government provides funding, coordination, and standards
  - States maintain autonomy in their operations, but collect and provide data according to standard specifications and agreed upon timelines
Maternal Mortality
NCHS HAS RESUMED ANNUAL PUBLICATION OF OFFICIAL MATERNAL MORTALITY STATISTICS

official statistics

extensive evaluation of data

information on changes in reporting methods

• now available •

For more information, visit https://www.cdc.gov/nchs/maternal-mortality/.
NCHS suspended publication of the maternal mortality rate in 2007

NCHS is publishing an official maternal mortality rate for 2018

Definition of Maternal Death – NCHS uses WHO definition of a maternal death: death of a woman while pregnant or within 42 days of termination of pregnancy

NCHS uses ICD-10 codes to classify cause of a maternal death
Before 2003, research showed underreporting of maternal deaths in the NVSS.

Some states had introduced pregnancy checkbox items to capture pregnancy or recent pregnancy to improve reporting.

- Lack of standardization among the various state death certificates.

The 2003 revision of the US Standard Death Certificate added the pregnancy checkbox item—recommended for use in all states by the HHS Secretary.
Pregnancy Checkbox

36. IF FEMALE:
- Not pregnant within past year
- Pregnant at time of death
- Not pregnant, but pregnant within 42 days of death
- Not pregnant, but pregnant 43 days to 1 year before death
- Unknown if pregnant within the past year
Implementation of the 2003 revision of the US Standard Death Certificate

Cumulative percent of jurisdictions with standard pregnancy checkbox item

Note: As of 2018, all states had implemented the 2003 certificate but California did not use the standard pregnancy item.
The addition of the pregnancy checkbox led to the identification of previously unreported maternal deaths

- As more states added the checkbox, the total number of identified deaths in the U.S. increased
- The increasing use of the checkbox complicated our ability to see trends in the actual number of maternal deaths

- The checkbox was frequently checked in error
  - Research on selected states identified both false positives and false negatives, though more false positives than false negatives

- As the checkbox became more universal, NCHS evaluated how the checkbox was used
One new report from NCHS: 2015 – 2016, NCHS recoded the maternal deaths without the checkbox:

- Found the effect of checkbox implementation increased reporting, especially for older women
  - The cause of death distribution leads us to believe that the majority are not maternal deaths for older women
  - For many of these older women, the checkbox was likely checked in error
Another new report from NCHS: Modeling of errors and trends

- Using log-binomial regression models, NCHS found that the increase in maternal mortality in the United States is not likely due to a true increase in the underlying extent of maternal mortality.
- The majority of the observed increase in the MMR is attributed to changes in data collection methods (that is, the gradual adoption of the checkbox over this period).
- Data visualization will be available soon.
### Number of Births and Deaths with Positive Pregnancy Responses in the Checkbox

**SOURCE:** Data from 2013

<table>
<thead>
<tr>
<th>Age</th>
<th>Births</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-44</td>
<td>134,540</td>
<td>145</td>
</tr>
<tr>
<td>45-49</td>
<td>10,329</td>
<td>89</td>
</tr>
<tr>
<td>50-54</td>
<td>780</td>
<td>148</td>
</tr>
<tr>
<td>55-59</td>
<td>74</td>
<td>33</td>
</tr>
<tr>
<td>60-64</td>
<td>7</td>
<td>51</td>
</tr>
<tr>
<td>65-69</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>70-74</td>
<td></td>
<td>51</td>
</tr>
<tr>
<td>75-79</td>
<td></td>
<td>46</td>
</tr>
<tr>
<td>80-84</td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>85 and over</td>
<td></td>
<td>147</td>
</tr>
</tbody>
</table>

NOTE: Alabama, Alaska, Colorado, Hawaii, Massachusetts, North Carolina, Virginia, and West Virginia did not have the standard checkbox in 2013.
Current Strategy and Coding Method

- Coding Change: Further age restriction for checkbox-only cases
  - Changed the restriction from 10-54 to 10-44
  - No age restriction when obstetric conditions are reported on the death certificate, i.e., maternal deaths due to an explicit obstetric condition will be counted regardless of age

- Resume annual publication of national maternal mortality rates with the release of the 2018 mortality data and continuing to improve the data and reduce errors
Multiple Options for Analysis

- Data for 2015-2018 released and made available to researchers
  - Coded using the original method
  - Recoded data without a checkbox item
  - Recoded previously released data using the new coding method

- Increases the availability of trend data to evaluate the addition of the checkbox for multiple years where all or most deaths will be coded under both sets of rules

- For checkbox only cases, we retain the original codes in addition to the coding that reflects the checkbox
National Maternal Mortality Rate for 2018

17.4 deaths per 100,000 LIVE BIRTHS
2018 Race Differences for Maternal Mortality

Death rate (per 100,000 live births)

- **37.1** Non-Hispanic black women
- **14.7** Non-Hispanic white women
- **11.8** Hispanic women
2018 Age Differences for Maternal Mortality

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Deaths per 100,000 live births</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 and over</td>
<td>81.9</td>
</tr>
<tr>
<td>25–39</td>
<td>16.6</td>
</tr>
<tr>
<td>Under 25</td>
<td>10.6</td>
</tr>
<tr>
<td>All ages</td>
<td>17.4</td>
</tr>
</tbody>
</table>

Maternal Mortality Rates without the Pregnancy Checkbox

NOTE: Trend line uses the coding method prior to 2003. Data for 2002 are included for comparison with the 2015–2018 values.

Rates are per 100,000 live births

2018 coding method

2002: 8.9
2015: 8.7
2016: 8.7
2017: 11.5
2018: 8.7

12.0
9.0
6.0
3.0
0.0
2002 2015 2016 2017 2018
Planned Improvements in the Collection of Maternal Mortality Data

- Enhance understanding of errors in the pregnancy checkbox and how to correct these errors
  - Examine existing EDR systems to see if improvements in design could help improve the data
  - Develop web service designed to prompt the cause of death certifier to confirm the information provided in the checkbox item

- Encourage cooperation between state vital records and state maternal and child health agencies
  - Rapid assessment of deaths of women of reproductive age
  - Linkages for deaths of women of reproductive age with birth and fetal death records

- New information derived from the assessment must then be incorporated in the vital statistics system
Maternal Mortality Reports and Products

https://www.cdc.gov/nchs/maternal-mortality/
Additional Mortality Data Releases
Final 2018 mortality data brief

https://www.cdc.gov/nchs/products/databriefs/db355.htm
Mortality Rates for All Causes and the 10 Leading Causes of Death

Source: https://www.cdc.gov/nchs/products/databriefs/db355.htm
Infant Mortality Rates for the 10 Leading Causes of Infant Death in 2018

Source: https://www.cdc.gov/nchs/products/databriefs/db355.htm
2018 Drug Overdose Data Brief

https://www.cdc.gov/nchs/products/databriefs/db356.htm
Age-adjusted drug overdose death rates, by sex

2018 rate = 20.7 per 100,000

Source: https://www.cdc.gov/nchs/products/databriefs/db356.htm
Drug overdose death rates involving opioids, by type of opioid

Deaths per 100,000 standard population

Source: https://www.cdc.gov/nchs/products/databriefs/db356.htm
Drug overdose death rates involving psychostimulants, by type of psychostimulant

Deaths per 100,000 standard population

Source: https://www.cdc.gov/nchs/products/databriefs/db356.htm
Provisional Drug Overdose Death Counts

Recent improvements in timeliness and data quality over the last year have prompted a re-evaluation of the length of time that data quality requirements have had to be met for states to be included in “Figure 2. 12 Month-ending Provisional Number of Drug Overdose Deaths by Drug or Drug Class.” As a result of this re-evaluation, trends for additional states are presented in Figure 2. Additional states will be added as they meet data quality and timeliness requirements. Please see the Technical Notes of the dashboard for more information.

This data visualization presents provisional counts for drug overdose deaths based on a current flow of mortality data in the National Vital Statistics System. Counts for the most recent final annual data are provided for

12 Month-ending Provisional Number of Drug Overdose Deaths

Figure 1a. 12 Month-ending Provisional Counts of Drug Overdose Deaths: United States

Source: https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm

Period showing decline between 2017 and 2018
Changes in Life Expectancy at Birth, 2010–2018

by Kenneth D. Kochanek, M.A., Robert N. Anderson, Ph.D., and Elizabeth Arias, Ph.D., Division of Vital Statistics

# Life Expectancy at Birth, by sex

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>78.7</td>
<td>76.2</td>
<td>81.0</td>
</tr>
<tr>
<td>2011</td>
<td>78.7</td>
<td>76.3</td>
<td>81.1</td>
</tr>
<tr>
<td>2012</td>
<td>78.8</td>
<td>76.4</td>
<td>81.2</td>
</tr>
<tr>
<td>2013</td>
<td>78.8</td>
<td>76.4</td>
<td>81.2</td>
</tr>
<tr>
<td>2014</td>
<td>78.9</td>
<td>76.5</td>
<td>81.3</td>
</tr>
<tr>
<td>2015</td>
<td>78.7</td>
<td>76.3</td>
<td>81.1</td>
</tr>
<tr>
<td>2016</td>
<td>78.7</td>
<td>76.2</td>
<td>81.1</td>
</tr>
<tr>
<td>2017</td>
<td>78.6</td>
<td>76.1</td>
<td>81.1</td>
</tr>
<tr>
<td>2018</td>
<td>78.7</td>
<td>76.2</td>
<td>81.2</td>
</tr>
</tbody>
</table>

## Percent Contribution to the Changes in Life Expectancy, by cause of death and sex, 2014 – 2017

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Percent</th>
<th>Cause of death</th>
<th>Percent</th>
<th>Cause of death</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive contribution</strong></td>
<td></td>
<td><strong>Negative contribution</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>63.4</td>
<td>Cancer</td>
<td>65.3</td>
<td>Cancer</td>
<td>62.7</td>
</tr>
<tr>
<td>Heart disease</td>
<td>8.5</td>
<td>Viral hepatitis</td>
<td>7.2</td>
<td>Heart disease</td>
<td>8.2</td>
</tr>
<tr>
<td>Influenza and pneumonia</td>
<td>6.7</td>
<td>Influenza and pneumonia</td>
<td>7.0</td>
<td>Influenza and pneumonia</td>
<td>6.3</td>
</tr>
<tr>
<td>Viral hepatitis</td>
<td>6.3</td>
<td>HIV disease</td>
<td>4.7</td>
<td>Viral hepatitis</td>
<td>5.3</td>
</tr>
<tr>
<td>HIV disease</td>
<td>4.0</td>
<td>Heart disease</td>
<td>3.7</td>
<td>Perinatal conditions</td>
<td>5.2</td>
</tr>
<tr>
<td>Other causes</td>
<td>11.2</td>
<td>Other causes</td>
<td>12.1</td>
<td>Other causes</td>
<td>12.3</td>
</tr>
<tr>
<td>Positive total</td>
<td>100.0</td>
<td>Positive total</td>
<td>100.0</td>
<td>Positive total</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Unintentional injuries</strong></td>
<td>50.6</td>
<td>Unintentional injuries</td>
<td>52.5</td>
<td>Unintentional injuries</td>
<td>40.1</td>
</tr>
<tr>
<td>Alzheimer disease</td>
<td>10.7</td>
<td>Suicide</td>
<td>8.8</td>
<td>Alzheimer disease</td>
<td>22.7</td>
</tr>
<tr>
<td>Suicide</td>
<td>7.8</td>
<td>Homicide</td>
<td>8.6</td>
<td>CLRD</td>
<td>4.6</td>
</tr>
<tr>
<td>Homicide</td>
<td>7.5</td>
<td>Alzheimer disease</td>
<td>5.9</td>
<td>Stroke</td>
<td>4.3</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2.8</td>
<td>Diabetes</td>
<td>3.3</td>
<td>Suicide</td>
<td>3.9</td>
</tr>
<tr>
<td>Other causes</td>
<td>20.6</td>
<td>Other causes</td>
<td>20.9</td>
<td>Other causes</td>
<td>24.4</td>
</tr>
<tr>
<td>Negative total</td>
<td>100.0</td>
<td>Negative total</td>
<td>100.0</td>
<td>Negative total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Percent Contribution to Changes in Life Expectancy, by cause of death and sex, 2017 – 2018

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Total</th>
<th>Male</th>
<th>Percent</th>
<th>Cause of death</th>
<th>Female</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive contribution</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Negative contribution</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>30.2</td>
<td>32.9</td>
<td>27.9</td>
<td>Influenza and pneumonia</td>
<td>27.4</td>
<td>24.4</td>
</tr>
<tr>
<td>Unintentional injuries</td>
<td>25.4</td>
<td>30.8</td>
<td>16.1</td>
<td>Suicide</td>
<td>12.3</td>
<td>11.6</td>
</tr>
<tr>
<td>CLRD</td>
<td>9.3</td>
<td>8.4</td>
<td>13.3</td>
<td>Nutritional deficiencies</td>
<td>10.5</td>
<td>8.3</td>
</tr>
<tr>
<td>Heart disease</td>
<td>7.0</td>
<td>6.0</td>
<td>12.7</td>
<td>Chronic liver disease</td>
<td>8.5</td>
<td>8.2</td>
</tr>
<tr>
<td>Homicide</td>
<td>4.7</td>
<td>3.0</td>
<td>4.4</td>
<td>Kidney disease</td>
<td>7.2</td>
<td>7.0</td>
</tr>
<tr>
<td>Other causes</td>
<td>23.4</td>
<td>18.9</td>
<td>25.6</td>
<td>Parkinson disease</td>
<td>7.2</td>
<td>7.0</td>
</tr>
<tr>
<td>Positive total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>Other causes</td>
<td>34.1</td>
<td>40.5</td>
</tr>
<tr>
<td>Negative total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>Negative total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Mortality Reports

Questions?

• Please submit your questions via the chat window in the Skype application
• The facilitator will address questions as time allows. Questions not answered may be forwarded to paoquery@cdc.gov

www.cdc.gov/nchs
https://www.cdc.gov/nchs/maternal-mortality/