

Measuring U.S. Maternal Mortality, National Vital Statistics System 2013-2017

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Background

- Pregnancy checkbox was added to the death certificate to better identify maternal deaths; death certificates with a checked pregnancy checkbox are coded to maternal death ICD-10 codes (excluding accidental, suicidal, homicidal deaths) regardless of cause of death
- Checkbox was associated with a large increase in maternal mortality ratio (MMR) for deaths coded to non-specific causes between 2008-9 to 2013-4; non-specific causes accounted for 83% of observed increase in MMR¹
- Non-specific death codes may serve as catch-all for those deaths not easily classified as maternal deaths and merit further examination^{1,2}

Questions:

- 1) What percentage of maternal deaths are coded to non-specific causes of death among states with the checkbox?
- 2) Does the national maternal mortality ratio change when only states with the checkbox are considered?

Methods

Maternal mortality ratio:

Number of maternal deaths / 100,000 live births

Maternal deaths include deaths from any cause related to, or aggravated by, pregnancy or its management excluding accidental or incidental causes during pregnancy and childbirth, or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy. ICD codes included A34 and O codes, excluding late maternal deaths (O66 and O67).

Maternal mortality ratios were calculated two ways using National Vital Statistics System (NVSS) 2013-2017 data accessed through CDC WONDER:

- 1) 50 states and D.C.
- 2) 39 states and D.C. which used the standard pregnancy checkbox by January 1, 2013

Non-specific causes of death included ICD-10 codes

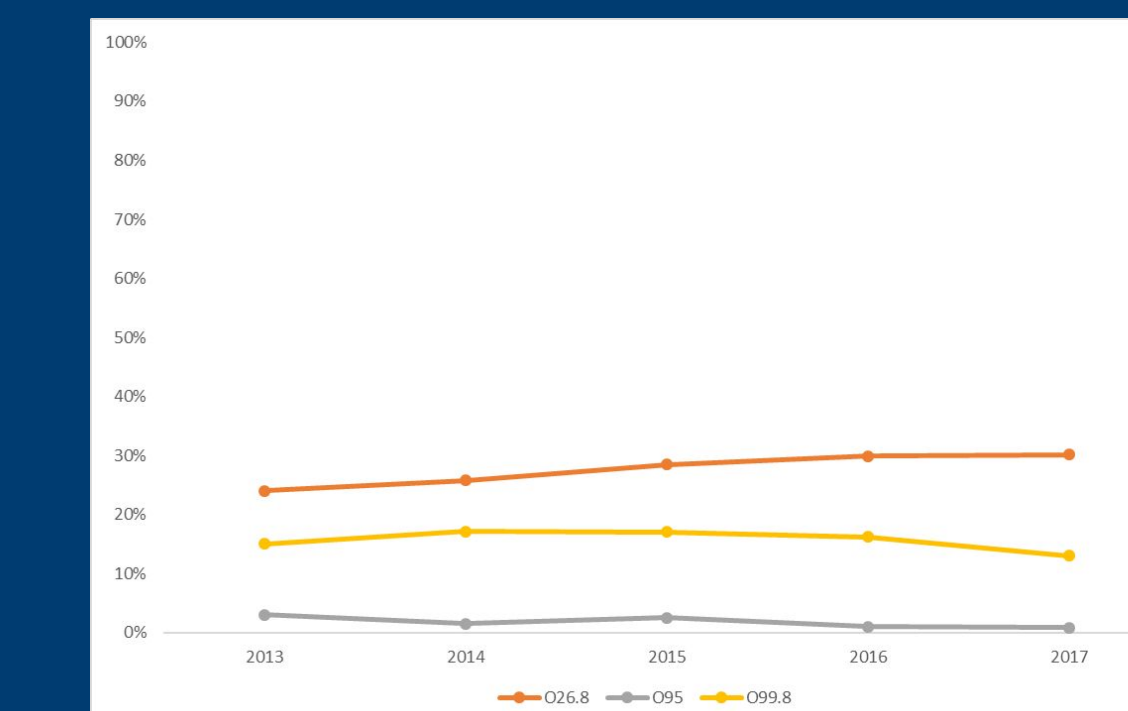
- **O26.8** (other specified pregnancy-related conditions)
- **O95** (obstetric death of unspecified cause)
- **O99.8** (other specific diseases and conditions)

Data quality issues related to the pregnancy checkbox are still affecting the national data system used to measure maternal mortality.

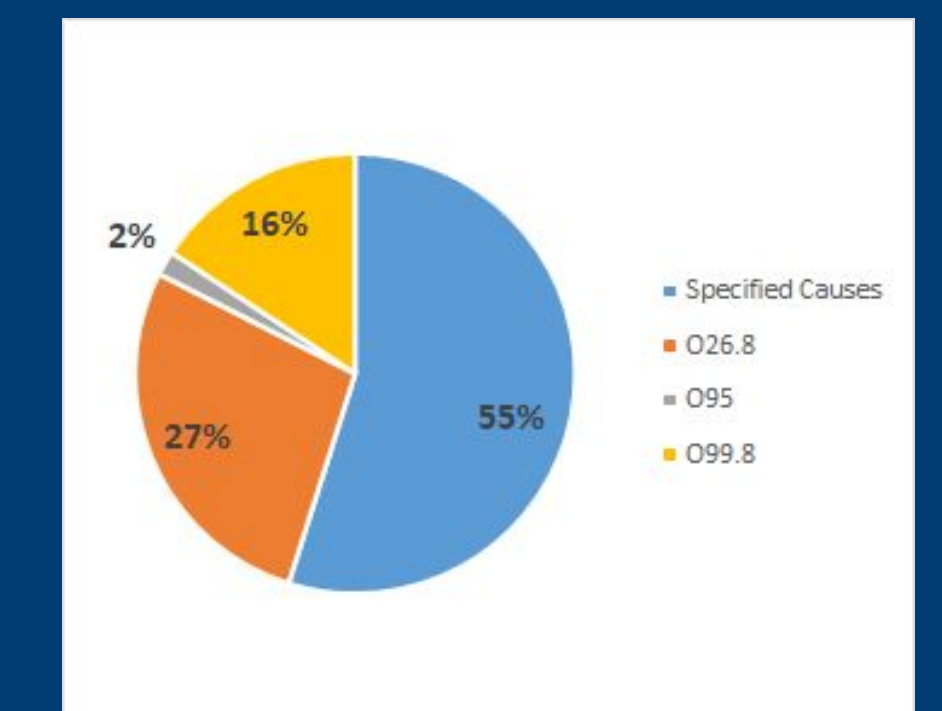
Findings

- 45.1% of deaths were coded to non-specific codes
- O26.8 was the largest non-specific cause accounting for 27.6% of deaths while O95 was the smallest (1.8%)
- The percentage of deaths coded to O26.8 increased from 24% to 30% between 2013-2017 among the 39 states and D.C. with the checkbox
- MMR increased 20% when calculated with only states with the checkbox (25.3 deaths) compared with all states (21.6 deaths)

Trend in percent of deaths coded to non-specific causes



Percent of deaths coded to non-specific causes



Discussion

- Non-specific causes of death made up almost half of maternal deaths
- Improving use of the checkbox and non-specific codes are next steps towards improving NVSS maternal mortality data
- Adoption of the standard death certificate should be considered when calculating MMRs from CDC WONDER database; statistics generated using NVSS data should be reported with caution
- NVSS is the nation's main death reporting system; yet in-depth case review is likely best approach for maternal mortality data
- Further research needed on what O26.8 represents³

Limitations

Analysis does not:

- Account for reporting differences between states other than checkbox
- Quantify the extent of misclassification of maternal deaths

1 MacDorman, M. F., Declercq, E., & Thoma, M. E. (2017). Trends in maternal mortality by socio-demographic characteristics and cause of death in 27 states and the District of Columbia. *Obstetrics & Gynecology*, 129(5), 811.
2 Creanga, A. A., & Callaghan, W. M. (2017). Recent increases in the US maternal mortality rate: disentangling trends from measurement issues. *Obstetrics & Gynecology*, 129(1), 206-207.
3 Joseph, K. S., et al. (2017). Factors underlying the temporal increase in maternal mortality in the United States. *Obstetrics & Gynecology*, 129(1), 91.

Acknowledgments

We thank the advisory committee, who provided guidance in the development of the *Health of Women and Children Report*, and United Health Foundation for their continued support of this project.

Disclosure

Arundel Metrics receives funding from United Health Foundation to produce America's Health Rankings. Arundel Metrics (arundelmetrics.com) is a small, data-driven consulting firm specializing in public health measurement and index generation.

