

Title:

An Analysis of Maternal Near Misses and Failure to Rescue Using Two National Data Sets

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Session Title:

Research Poster Session 1

Slot (superslotted):

RSC PST 1: Friday, 28 July 2017: 10:00 AM-10:45 AM

Slot (superslotted):

RSC PST 1: Friday, 28 July 2017: 12:00 PM-1:30 PM

Keywords:

Failure to Rescue, Maternal Mortality and Maternal Near Misses

References:

MacDorman, M. F., Declercq, E., Cabral, H., & Morton, C. (2016). Recent increases in the U.S. maternal mortality rate: Disentangling trends from measurement issues. *Obstetrics & Gynecology*, 128, 1-10. doi: 10.1097/AOG.0000000000001556

Friedman, A., M., Ananth, C. V., Huang, Y., D'Alton, M. E., & Wright, J. D. (2016). Hospital delivery volume, severe obstetrical morbidity, and failure to rescue. *American Journal of Obstetrics & Gynecology*, pii: S0002-9378(16)30474-4. doi: 10.1016/j.ajog.2016.07039

World Health Organization. (2012). *The WHO application of ICD-10 to deaths during pregnancy, childbirth, and the puerperium: ICD-MM*. Geneva: WHO Press.

Abstract Summary:

The U.S. is experiencing an increase in maternal mortality. This study analyzes Birth and Multiple-Cause of Death records to identify where failure to rescue occurs.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
<ul style="list-style-type: none">• The learner will be able to discuss factors related to maternal near miss experiences and subsequent failure to rescue.	<ul style="list-style-type: none">• Overview of maternal mortality worldwide and in the United States. • Synthesis of evidence for maternal near misses and failure to rescue.
<ul style="list-style-type: none">• The learner will be able to describe the sample characteristics of women who delivered a live-born infant in the United States in 2014 and died in that period as a result of the pregnancy, a condition occurring	<ul style="list-style-type: none">• Discussion of preliminary study findings on the cohort from 2014 national data set. • Review of methods to calculate failure to rescue from 2012 to 2015 national data.

during the pregnancy, the birth, or during the postpartum period.	
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Abstract Text:

Purpose: The aim of this study is to use a population-level approach to identify and quantify maternal near misses and failure to rescue in the United States from 2012 through 2015 with data derived from 96.2% of deliveries and maternal deaths during the period.

Methods: We will use a descriptive, epidemiological, cohort design and will analyze Birth and Multiple-Cause of Death records available from the U.S. National Center for Health Statistics to identify vulnerable groups and vulnerable locations where failure to rescue occurs. We will calculate failure to rescue using an approach endorsed by the National Quality Measure Clearinghouse and the Agency for Healthcare Research and Quality, but tailored to fit the care of mothers during pregnancy, birth, and the puerperal period. Data documenting seven specific complications (maternal morbidities) will be extracted from national birth records for 2012-2015. These records describe births in 47 states, the District of Columbia, Guam, Puerto Rico, and the Northern Marianas. While some states do not use the 2003 revised birth certificate, variables that are comparable across various versions of the birth certificate are included and flagged. These data represent approximately 4 million births, annually (16 million births over the four-year period). All deaths processed by the National Center for Health Statistics are included in the national multiple-cause death files. We will analyze only death records having ICD-10 Maternal Death codes (O001-O999) as the underlying cause of each maternal death as well as the Record Axis codes corresponding to the maternal morbidities in the birth records. Each of the four years will include approximately 1000 maternal deaths for a total of 4000 cases analyzed during the study period.

Results: Preliminary analyses are derived from a population cohort comprised of all women who delivered a live-born infant in the U.S. in 2014 and died in that period as a result of the pregnancy, a condition occurring during the pregnancy, the birth, or in the postpartum period. The 2014 birth data were comprised of 3,998,175 births representing mothers for whom a U.S. certificate of live birth was submitted. Mothers giving birth in 2014 ranged in age from 12 to 50 years, with the greatest percentage of births occurring to women in the age range of 25 – 29 years and the least percentage occurring to those under 15 and in the 50-54 year range (0.1% and 0.0%, respectively). Race/ethnicity data indicate that for 3.3% of the maternal population, these data are missing. For the remaining mothers in the data, 23.0% were Hispanic and 76.3% were non-Hispanic (including origin unknown). Regarding marital status, 59.8% of the mothers were married and 40.2% were unmarried at the time of the birth. Mothers in 2014 had from 1 through 17 children still living from previous births. The majority of mothers (39.1%) had no living children at the time of the birth in 2014. Thirty two percent had one living child at the time of the birth, 16.7% had two living children, 7.0% had three living children, and 2.7% had four living children. Two percent of mothers had from 5 to 17 children alive at the time of the birth in 2014, and for 0.3% of the mothers, the number of children living at the time of the birth is unknown or unstated. For mothers giving birth in 2014, 98.3% had no children dead from a previous live birth, 1.0 % had one child dead from a previous live birth, and 0.1% had two children dead. The remaining mothers (0.0%) had between 3 and 12 children dead from a previous live birth. For 0.5%, it is unknown or unstated as to whether the mother had children dead from previous live births.

Regarding other terminations of pregnancy, 73.5% of mothers did not have a prior other termination of pregnancy, while 16.5% had one prior other termination of pregnancy, 5.5% had two prior other terminations, and 1.9% had three. The remaining 2.6% of mothers had between 5 (0.3%) and 29 (0.0%) prior other terminations. For 1.4%, information for prior other terminations is unknown or not stated. For approximately 3.6% of the population, data for the month of pregnancy in which prenatal care began are missing. For the 96.4% of mothers who had prenatal care data, the breakdown by month prenatal care began indicated that 1.5% of the mothers had no prenatal care. The plurality of mothers began prenatal care in the second month of pregnancy (38.4%). Regarding participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), approximately 41% of the mothers received

WIC. Concerning the socioeconomic indicator, principal payment source for the delivery, 3.6% of the maternal population had missing data. Removing the missing data from consideration, the principal payment source for the delivery was private insurance (47.3%) or Medicaid (43.2%). Regarding place of birth, the majority of the population (98.5%) gave birth in a hospital. Another 1% gave birth in a residence, and 0.5 % gave birth in a free-standing birthing center.

Conclusion: This will be the first population-level study to identify and quantify maternal near misses and failures to rescue across ethnic and sociodemographic groups and across counties and states - focusing especially on Medically Underserved Areas and Health Professional Shortage Areas in the U.S.