Meeting the Challenges of Measuring and Preventing Maternal Mortality in the United States

Accessible version: https://www.youtube.com/watch?v=jAFXdVK0gMU
Maternal Mortality Beyond the Numbers

Eleni Z. Tsigas
CEO, Preeclampsia Foundation
Working with the Media, We Have Put a Face on the Problem of Maternal Mortality

The Last Person You’d Expect to Die in Childbirth

The U.S. has the worst rate of maternal death.

Why Are American Women Dying in Childbirth?

You would be 10 times safer having a baby in Belarus than in the United States.

By Joy Victory Dec 12, 2015

I’m 40 weeks pregnant and nearly 24 hours into labor, and there is vomit everywhere.

Stomach acid and red Powerade splatter across the kitchen floor, up the walls and the...
What is Preeclampsia?

- Rapidly progressive pregnancy and postpartum condition characterized by high blood pressure and, usually, protein in the urine
  - Symptoms may include swelling, sudden weight gain, headache and vision changes

- HELLP syndrome and eclampsia (seizures) are serious forms of preeclampsia
Chris and Megan McKee, Catonsville, MD
Sunflowers with Oliver
Sunflowers with Oliver

First Christmas without Mommy

Christie Polverelli, Upstate New York

It's a Girl!!!! Never been so happy, This May our family will be complete. ily
Denial and Delays
Denial and Delays

Baby Elle born weighing 1 lb 12 oz.
The Aftermath

April 22, 1987–February 27, 2013
The Aftermath

April 22, 1987–February 27, 2013
Mental Health and Quality of Life Consequences

Anger
Failure
Guilt
Anxiety
Fractured families
Post-traumatic stress disorder (PTSD)
Depression
Acute stress disorder

Tia Doster and Daughter Ayah, Miami, Florida
Maternal Morbidity Has Lasting Consequences
Maternal Morbidity Has Lasting Consequences

Tia endured a long emotional recovery from PTSD, in addition to physical therapy and a year on dialysis.

“I will forever be an advocate for people to take control of their health.” ~ Tia Doster
Black Women Are Dying at a Higher Rate

Essence Magazine, Special Report: The Childbirth Crisis No One’s Talking About. October 2017
“I drove to the house, crying all the way there and all the way back. I was grieving the loss of my wife. The reality of her loss became so real the past night, that it was as if it actually occurred.”
Thank you
Accounting for Maternal Deaths: Action Requires Better Data

William M. Callaghan, MD, MPH

Chief, Maternal and Infant Health Branch
Division of Reproductive Health
Centers for Disease Control and Prevention
MATERNAL DEATHS—ONE IN A THOUSAND

The Journal takes pride in announcing that for the first time in history the maternal mortality rate for a large nation—the United States of America—has been pushed slightly below the apparently irreducible minimum of 1 maternal death per 1,000 live births. When

This is, indeed, a story of human as well as medical progress. The fact that the chances of survival for the mother are better than 999 out of 1,000 should bring comfort and consolation in a troubled era to expectant mothers and their husbands, their children and their parents. Childbearing has been made quite safe.
Maternal Mortality Rate, United States

Healthier Mothers and Babies

At the beginning of the 20th century, for every 1000 live births, six to nine women in the United States died of pregnancy-related complications, and approximately 100 infants died before age 1 year (1,2). From 1915 through 1997, the infant mortality rate declined >90% to 7.2 per 1000 live births, and from 1900 through 1997, the maternal mortality rate declined almost 99% to <0.1 reported death per 1000 live births (7.7 deaths per 100,000 live births in 1997) (3) (Figures 1 and 2). Environmental interventions, improvements in nutrition, advances in clinical medicine, improvements in access to health care, improvements in surveillance and monitoring of disease, increases in education levels, and improvements in standards of living contributed to this remarkable decline (1). Despite these improvements in maternal and infant mortality rates, significant disparities by race and ethnicity persist. This report summarizes trends in reducing infant and maternal mortality in the United States, factors contributing to these trends, challenges in reducing infant and maternal mortality, and provides suggestions for public health action for the 21st century.
If Americans Love Moms, Why Do We Let Them Die?

Nicholas Kristof  JULY 29, 2017
Maternal Mortality Rate 1999–2014

cdc.gov/nchs/nvss/deaths.htm
Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.
Vital Statistics: The Basis for Identification

- Based on death certificates sent from the states
- Coded by ICD-10 coding rules
- Information based on cause of death and checkbox indicating recent or current pregnancy status
  - Checkbox introduced in 2003 with incremental uptake over time
  - Not all maternal deaths have a clinically meaningful code
- Historically, maternal deaths were undercounted
- Pilot studies of checkbox suggest misclassification
  - No recent pregnancy
  - Cause of death not related to pregnancy
- Death certificates may paint an incomplete picture
Pregnancy Mortality Surveillance System (PMSS)

- ACOG/CDC Maternal Mortality Study Group (1986)
- Pregnancy-associated
  - All deaths during pregnancy and within the year following the end of pregnancy
- Pregnancy-related
  (subset of pregnancy-associated; causal relationship)
  - Complication of pregnancy
  - Aggravation of an unrelated condition by the physiology of pregnancy
  - Chain of events initiated by the pregnancy
- Pregnancy-related mortality ratio (PRMR)
PMSS: Enhanced Surveillance

- Based on information from states
  - Death certificates AND
  - Linked birth or fetal death certificates
- Independent of ICD-10
- Information includes cause of death (COD) and checkbox indicating recent or current pregnancy status and details concerning pregnancy
  - COD descriptions often unclear
  - If checkbox only and unclear COD, difficult to include or exclude
- Clinical relevance instead of rule-based designation of COD
Comparing Measures

PRMR: Pregnancy-related mortality ratio
MMR: Maternal mortality rate
cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

Deaths per 100,000 births

- Pregnancy-related Mortality Ratio (PRMR)
- Maternal Mortality Rate (MMR)
- PRMR <=42 days

Pregnancy mortality surveillance system, National Vital Statistics System
Cause-specific Proportionate Pregnancy-related Mortality
PMSS, 1987–2013

De-identified State Specific Pregnancy Mortality Ratios

PMSS, 2006–2013

Deaths per 100,000 births

50 States + Washington, DC

PMSS: Pregnancy Mortality Surveillance System
Pregnancy-related Mortality by Race and Hispanic Ethnicity, 2006–2013

Deaths per 100,000 births

- Non-Hispanic White
- Non-Hispanic Black
- American Indian/Alaska Native
- Asian/Pacific Islander
- Hispanic

PMSS: Pregnancy Mortality Surveillance System
What Are the Real Trends in Maternal Mortality?

- The measured maternal mortality rate is increasing
- The pregnancy-related mortality ratio has increased but is now relatively stable
- Disparities are persistent, and some causes of death may be increasing
- There are hints that efforts to improve identification have resulted in misclassification
  - What is the extent of the false positives?
  - What is the extent of the false negatives?
  - Why are mistakes being made?
Beyond Better Data

- We need to aspire to something greater
  - Information needed for prevention will not be found on death certificates

- There is no acceptable rate of maternal mortality
Where Can We Go?

- Surveillance of maternal mortality is driven by information from *state-based* reviews which:
  - Go beyond vital statistics
  - Inform and evaluate local quality improvement initiatives
  - Provide an accurate national picture for trends and causes of death
Building U.S. Capacity to Review and Prevent Maternal Deaths

- Technical assistance for jurisdiction-level maternal mortality review
- Promote identification of interventions with the greatest potential to end preventable maternal mortality
- CDC Division of Reproductive Health initiative supported by funding from Merck
Resource developed by Association of Maternal and Child Health Programs in partnership with the CDC Foundation and CDC

Goals

- Assist states to establish maternal mortality review committees
- Connecting states with committees
- Standardize processes
Policies and Practices to Protect Lives of Pregnant Women, Mothers and Mothers to Be

Lisa M. Hollier, MD, MPH, FACOG
President-elect, American College of Obstetricians and Gynecologists
Chair, Texas Maternal Mortality and Morbidity Task Force
Professor, Baylor College of Medicine
Texas Has the Highest Maternal Mortality Rate in the Developed World. Why?

by ELIZABETH CHUCK
In the Headlines

Maternal Mortality Ratio -- Texas

Maternal Mortality Review Committees

- Verify the accuracy of reported information
  - Case identification
    - O-codes from death certificates (including “late” codes for deaths up to 1 year)
    - Matching each woman's death record with a birth or fetal death within 365 days
  - Case verification
    - Cases with obstetric causes of death without a birth or death certificate match are then matched to inpatient hospital discharge records
    - Medical records are requested
    - Autopsy information, investigative reports
Maternal Mortality Review Committees

➢ Characterize the maternal death

1. Was the death pregnancy-related?
   ☐ If she had not been pregnant, would she have died?
2. What was the cause of death?
3. Was the death preventable?
4. What were critical contributing factors to the death?
Opportunities for prevention

5. What are recommendations and actions to address these factors?
6. What is the anticipated impact of those actions if implemented?
Maternal Mortality Review Committees
Findings and Recommendations

Top causes of maternal death in Texas 2011–2012

- Access to substance use services
- Pregnant women given priority
- Evidence-based screening and referral

Percent of all Maternal deaths

Cardiac event: 20.6
Drug overdose: 11.6
Hypertension/eclampsia: 11.1
Hemorrhage: 9.0
Sepsis: 9.0
Homicide: 7.4
Suicide: 5.3
Maternal Mortality Review Committees: Lessons Learned

- Enhanced data collection processes
  - Educational programs
  - Legislation
  - Appropriations

- Translating data into action
  - Understanding the causes/contributing factors
  - Recommendations to state medical societies
National Agenda on Maternal Mortality

- National Partnership to Eliminate Preventable Maternal Mortality
  - CDC and CDC Foundation
  - Association of Maternal & Child Health Programs (AMCHP)
  - 23 organizations

- Council on Patient Safety in Women’s Health Care
  - American College of Obstetricians and Gynecologists (ACOG)
  - Health Resources and Services Administration (HRSA)
  - Alliance for Innovation on Maternal Health (AIM)
  - 21 organizations
Alliance for Innovation on Maternal Health

- National data-driven maternal safety and quality improvement initiative working to:
  - Reduce maternal mortality
  - Reduce severe maternal morbidity

- Disseminates condition-specific “bundles”—evidence-based action steps to guide best care

Implementation to National Scale

safehealthcareforeverywoman.org
AIM Quality and Safety Bundles

Safety Bundles

- Obstetric Hemorrhage
- Severe Hypertension in Pregnancy
- Maternal VTE Prevention
- Patient, Family and Staff Support
- Safe Reduction of Primary Cesarean Births

Safety Tools

- Maternal Early Warning Criteria
- SMM Case Review Forms
- Maternal Mental Health

For Every Birth

- Reducing Disparities in Maternity Care
- Postpartum Care Basics
- Interconception Care Coming Soon

Obstetric Care of Women with Opioid Dependence

safehealthcareforeverywoman.org/aim-program/
AIM: Alliance for Innovation on Maternal Health
The goal of regional maternal care is for pregnant women to receive care in facilities that are appropriate to their risk, thereby reducing maternal morbidity and mortality in the United States.
Verification Program

Step 1: Complete LOCAtE.

Step 2: Conduct on-site review.

Step 3: Verify level of maternal care.

National Agenda on Maternal Mortality

H.R. 1318 – Preventing Maternal Deaths Act of 2017
S.1112 – Maternal Health Accountability Act of 2017

- Strengthen state efforts to prevent maternal deaths
- Support states in establishing or expanding maternal mortality review
- Promote national information sharing
The Role of Public-Private Partnerships in Generating Evidence for High-Impact Solutions

Mary-Ann Etiebet, MD, MBA
Executive Director
Merck for Mothers
Bringing the best of Merck to create a world where no woman dies giving life

6.6 million women reached, and counting

30 countries
100 partners
50 programs

HER LIFE

2.5m women with improved quality of care
3.7m women with access to modern contraception
638k women empowered to demand quality care

HER HEALTHCARE

51k providers equipped to offer quality care
18.9m people with access to quality facilities
15.4m people with access to lifesaving products
Merck’s Legacy: A Decades-Long Commitment to Improving Global Health Outcomes

“Women are the cornerstone of a healthy and prosperous world. When a woman survives pregnancy and childbirth, her family, community and nation thrive.”

- Ken Frazier, Merck President & CEO
Using Data to Identify Opportunities for Intervention

About 40% of women receive maternal and family planning care from private health providers.

- **Antenatal care**
  - Public: 44%
  - Private: 56%

- **Delivery care**
  - Public: 40%
  - Private: 60%

- **Family planning**
  - Public: 37%
  - Private: 63%

*Private care includes all non-governmental care, including for-profit and not-for-profit individuals and institutions.
**Appropriate care for antenatal care: one or more visits for delivery; giving birth in a facility with a skilled birth attendant at home; for family planning: using a modern contraceptive method.
Nigeria has the largest number of maternal deaths
- Nearly 20% of all maternal deaths globally

Like the United States, Nigeria’s maternal mortality ratio (MMR) is increasing
- In recent years, the MMR increased from 545 to 576 deaths per 100,000 live births

Fewer than 40% of deliveries take place in a health facility
- Of these facility deliveries, 40% are with private providers
Implementing Evidence-Based Solutions in Nigeria

- **Introducing a total market approach**
  - Increase the number of deliveries in health facilities
  - Improve the quality of both public and private maternity care
  - Improve linkage between private and public facilities to ensure access to comprehensive obstetric care

- **Establishing maternal and perinatal death reviews**
  - Initiate routine, multidisciplinary reviews to enable quality improvement at facilities
Understanding the Problem of Maternal Mortality in Our Own Backyard

Based on new maternal mortality review data:

- Nearly 60% of maternal deaths are preventable
- The leading drivers of maternal death differ by race and age
- Mental health has been identified as a leading underlying cause of pregnancy-related death
Understanding the Drivers of Disparities in Maternal Health Outcomes

- Evidence of disrespect and abuse in the global literature
  - Poorest women have the worst maternal outcomes
  - 20% of poor women report being disrespected and abused

- Are negative experiences contributing to the disparities we observe in maternal health outcomes?
  - *Merck for Mothers* has partnered with researchers to answer this question

![Pregnancy-related mortality ratios by race (CDC, 2011–2013)](chart.png)
Understanding the More Prevalent Problem of Severe Maternal Morbidity

- Globally, there are five near-misses for every woman who dies from pregnancy or childbirth
  - There are 20 cases of severe maternal morbidity for every death

- In the United States more than 50,000 women each year suffer severe complications
  - New York City
    - Women with at least one chronic condition are at least three times more likely to suffer from severe maternal morbidity
    - Deliveries complicated by severe maternal morbidity cost $6,000 more than deliveries with no complications
Implementing Evidence-Based Solutions in the United States

- **Addressing direct drivers of maternal mortality**
  - *Merck for Mothers* supported implementation of safety bundles to standardize care for three of the top drivers of maternal mortality in 300+ facilities across five states.

- **Addressing indirect drivers of maternal mortality**
  - We are working with community-based organizations to link pregnant women with chronic conditions to care and social services.
From Awareness to Action

Many Nurses Lack Knowledge Of Health Risks To Mothers After Childbirth

America’s Shocking Maternal Deaths
Thank you
Meeting the Challenges of Measuring and Preventing Maternal Mortality in the United States

November 14, 2017