Maternal Mortality and Morbidity Review

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Millennium Development Goals

1. Eradicating extreme poverty and hunger
2. Achieving universal primary education
3. Promoting gender equality and empowering women
4. Reducing child mortality rates
5. Improving maternal health
6. Combating HIV/AIDS, malaria and other diseases
7. Ensuring environmental sustainability
8. Developing a global partnership for development
Maternal Mortality – maternal deaths /100,000 live births during pregnancy or within 42 days of termination of pregnancy.

A ratio not a rate: cannot count total # pregnancies.

Pregnancy related – maternal deaths /100,000 birth within 1 year of termination of pregnancy.

Pregnancy Related

OB complications, management, or disease exacerbated by pregnancy

Pregnancy Associated

When pregnancy and death may or may not be causally related

Direct

OB complications or management

Indirect

Preexisting disease aggravated by pregnancy
Maternal health

Maternal mortality ratio (per 100,000 live births), 2008

http://www.who.int/gho/maternal_health/en/

Data //Source: http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/PMSS.html#5
Maternal Mortality Ratio, US and Texas 1996-2010

Source: Texas Department of State Health Services, July 2012
Maternal Death Harris County 2001 - 2010, 3 year averages
Maternal Mortality Ratio (deaths during pregnancy or within 42 days)
Pregnancy Related Deaths (During or within 1 year of pregnancy & caused by pregnancy complications)
Maternal Deaths in Harris County, 1999 - 2010

Maternal Deaths
- No deaths
- Lowest number of deaths
- Highest number of deaths

Number of Maternal Deaths in Harris County 1999 - 2010.
Data Codes used for data pull:
- Pregnancy with abortive outcome: O00-O07
- Other complications of pregnancy, childbirth and the puerperium: O10-O99

Data Source: Texas Department of State Health Services.
March 2010
Why are Maternal Mortality rates Rising?

- Improved vital statistics – ICD 10 codes
- Death certificate check boxes
- Increasing age or increasing prevalence of maternal chronic conditions
  - Hypertension
  - Diabetes
  - Obesity
- Social factors
- Factors related to health care system & access to quality care
Maternal Morbidity

• Maternal Mortality is a sentinel event for maternal morbidity.
• Severe morbidity can effect a woman’s lifelong wellbeing.
• For every one maternal death there are approximately 50 women who experience severe morbidity.
• In 2010:
  – Texas about 5,050 women affected

A Continuum of Maternal Health
NORMAL PREGNANCY→ MORBIDITY→ NEAR MISS→ DEATH

- Morbidity is an important outcome
- Morbidity affects many women
- Morbidity provides more cases for clinical review/monitoring of care
- Knowledge gained can improve treatment & prevent progression to more severe morbidity or death

Geller, S., Cox S., Callaghan, W., Berg, C. Morbidity and Mortality in Pregnancy: Laying the Ground work for Safe Motherhood,
Financial Costs

- To family
- To community
  - Financial cost of premature death, 3 – 5 million / woman
- To Medical system
  - Mother’s pregnancy and delivery most expensive condition treated in US hospitals in 2008
  - Rising C-Section rate = increased costs
  - High blood pressure in pregnancy associated with 3.5 days average stay, and average total cost $9,800/stay vs $5,774 for normal delivery.
  - California: 1996 -2006 PP hemorrhage increased 36% and increased expenditures of $3,277 per woman affected

In Texas in 2009, of the top 20 most expensive conditions billed to Medicaid,
- eight were related to pregnancy and
- four were for complications related to pregnancy.
- The four complication categories resulted in hospital charges of approximately $1.35 billion dollars.
WE NEED TO KNOW ‘WHY’ TO BE ABLE TO ADDRESS THE CAUSES
DEADLY DELIVERY

THE MATERNAL HEALTH CARE CRISIS IN THE USA
Maternal Mortality and Morbidity Review Boards
History and Purpose/Concerns

States without a maternal mortality review board

Deadly Delivery, Amnesty international
CURRENT APPROACHES TO ADDRESS MATERNAL MORTALITY
The Joint Commission: Preventing Maternal Death

- 2010 Sentinel Event
- Suggested actions:
  Case identification, review, and report
  Development of strategies for prevention
  Multi-disciplinary participation and collaboration

Joint Commission Sentinel event Alert January 26, 2010 http://www.jointcommission.org/assets/1/18/SEA_44.PDF
Hospital Corporation of America

- Data from six years root cause analysis: 2000 – 2006
- 124 hospitals throughout the USA
- 1.5 million births
- Approach: eliminate variability in provision of care
  specificity in treatment protocols
  increase reliance on check-lists
  ready use of consultants
  quality improvement emphasis on ‘systems change’
- Maternal mortality rate: 6.5/100,000 live births
American College of Obstetrics & Gynecology (ACOG)

- Pregnancy Risk Assessment Monitoring System - 1987
- MOMS program (Making Obstetrics and Maternity Safer) – 2010
- 2011 – lobbying and promotion for passage of federal House Bill 894
- Encouragement of member promotion and involvement in state maternal mortality review boards
Pregnancy Mortality Surveillance System (PMSS)

- Located within the CDC Division of Reproductive Health
- Inception: 1986
- Collaboration of Center for Disease Control and Prevention, ACOG and state health Departments
- **Purpose**: Address ICD restrictions and incomplete or inaccurate information on death certificates
- Definitions ‘pregnancy-related mortality’ and ‘pregnancy-associated mortality’ came from this collaboration
- Every year, state death certificates for women who die during or within 1 year of pregnancy, along with birth or fetal death report are sent to a Maternal Mortality Study Group within CDC’s Reproductive Health Division
- Data probably more accurate than ICD codes or state death certificates

(Callaghan, 2012)
Maternal Mortality Review Boards (MMRB)

- What: Multi-disciplinary group to address state maternal mortality and morbidity
- Why: High and rising maternal death rates; increasing medical care cost; MDG global push
- Benefits/contributions: State specific identification of maternal mortality and morbidity etiologies; capture more cases and the ‘broad picture’
Findings and Interventions from Review of Maternal Mortality
California- leading causes of Pregnancy related death

**Before review**
- 17% Preeclampsia / eclampsia
- 15% Hemorrhage
- 14% Amniotic Fluid embolism
- 7% Sepsis/infection
- 6% Venous embolism complications
- 41% Other complications

**After review**
- 20% Cardiovascular disease
- 15% Preeclampsia / eclampsia
- 14% Amniotic Fluid embolism
- 10% Obstetrical Hemorrhage
- 8% Sepsis / infection

California Pregnancy associated mortality review Report from 2002 and 2003 death reviews, April 2011
Other states

- **New York: 2002-2003**
  - Embolism
  - Hemorrhage
  - Hypertension

- **Florida: 2009**
  - 25.9% Infection (87% included Flu like symptoms - 58% NIH1)
  - 20.7% Hemorrhage
  - 12.1 Cardiovascular
  - other

- Being obese, class III (morbidly obese) BMI of 40.0 or above (RR 9.0).
- Not receiving any prenatal care (RR 6.9).
- Having a cesarean delivery (RR 4.6).
- Being 35 years or older (RR 4.1).
- Less than a high school degree (RR 3.7).
- Black race (RR 3.3)
- Other risk factors – chronic disease
Timing of Maternal Deaths

- **California:**
  - 93% of deaths within 6 weeks postpartum

- **Florida:**
  - 17% prenatal
  - 6% L&D
  - 42% Postpartum not discharged
  - **35% Postpartum after discharge**
Insurance coverage

California:

- Of women who died that were covered by MediCal, 11% died after 42 days.
- No deaths occurred after 42 days for women with private insurance.
Why Mothers Die 1997 - 1999, CEMD

Maternal Deaths per 100,000 maternities

- PIH
- Hem
- AFE
- Sepsis
- TE

Intervention !!!
Managing Maternal Hemorrhage

**Vital Signs** Normal vitals don’t guarantee patient stability
- Airway—intubate
  If inadequate ventilation or to assist airway protection
- Breathing
  Supplemental O2, 5-7 L/min by tight face mask to assist O2 carrying capacity
- Circulation
  Pallor, delayed capillary refill and decreased urine output can indicate compromised blood volume without change in BP or HR.
  Late signs of compromise are: decreased urine output, low BP and tachycardia.

**Infusions**
- Start 2nd large bore (16 gauge or larger)
- RL or NS replaces blood loss as 3:1
- Volume expanders 1:1 (albumin, hetastarch, dextran)
- Transfusion (PRBC, Coagulation factors)
- Warm blood products and infusions to prevent hypothermia, coagulopathy and arrhythmias

**Medication for uterine atony**
- **Oxytocin**
  10-40 units in 1 liter NS or RL IV rapid infusion
  *30-40 unit/titler most commonly used dose for hemorrhage
- **Methylergonovine (Methergine)**
  0.2 milligrams intramuscular q 2-4 hrs maximum 5 doses; avoid with hypertension
- **Prostaglandin F2 Alpha (Hemabate)**
  250 micrograms intramuscular, intramyometrial, repeat q 15-90 minutes, maximum 8 doses; avoid with asthma or hypertension
- **Prostaglandin E2 suppositories (Dinoprostone, Prostin E2)**
  20 milligrams per rectum q 2 hrs; avoid with hypotension
- **Misoprostol (Cytotec)**
  1000 micrograms per rectum or sublingual (ten 100 microgram tabs or five 200 microgram tabs)
- **Surgical interventions**
  May be a life-saving measure and should not be delayed
Illinois

- Problem: Hemorrhage
- Intervention: hemorrhage education program.
- Mandated participation
- Ambulances directed to hospitals with obstetric care.
What we did in Texas!

Legislative Advocacy
Public Awareness
Quality of Care/Service Delivery
Resource Enrollment
Why Texas Needs an MMRB

- Identify reasons for maternal mortality and morbidity
  (Preventable deaths range from 40 - 75%)
- Determine plan of action to improve the death rate, and eventually the morbidity
- Implement the plan
- Evaluate for positive outcomes.
- Continue to track and trend (CQI)
Texas 2011
HB 1133 MMMR Taskforce

- Legislation proposed by Rep Walle and coauthored by Rep Farrar
- Heard in Public Health Committee – failed to receive required votes.
- Went to special Study status from the Senate
- Healthy Texas Babies Expert Panel
  - Maternal Mortality Review Committee
Texas 2013 Legislative Session

- HB 1085 - Rep Walle sponsor and co-sponsored by Rep Davis, Rep Collier

- SB 495 – Senator Huffman and co-sponsored by Senator West
What are we doing about it nationally?

- Federal bill HR 894 Maternal Health Accountability Bill of 2011
What Can We Do?

- Get involved ‘right where you are’
- Educate yourself
- Educate others
Web sites

Women Deliver http://www.womendeliver.org

World Health Organization (WHO)

http://www.who.int/reproductivehealth/publications/en/

http://www.who.int/maternal_child_adolescent/en/

Every mother counts http://www.everymothercounts.org/

Center for Disease Control (CDC)

http://wonder.cdc.gov/

http://www.cdc.gov/reproductivehealth/

The California Maternal Quality of Care Collaborative

http://www.cmqcc.org/

United Nations Population Fund UNFPA

http://www.unfpa.org/public/mothers/

United Nations Development Program (UNDP)

http://www.undp.org/content/undp/en/home/mdgoverview.html
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