Women’s Health in the Developing World

http://www.dphotojournal.com/imagesinspirations/mother-child.jpg
Objectives:

- Define Maternal Mortality.
- Name the five major causes of Maternal Mortality in the Developing World.
- Describe 2 services offered in each clinical level: Basic Emergency Obstetric Care and Comprehensive Emergency Obstetric Care.
- Name 2 medication interventions that can decrease maternal mortality.
- Consider other threats to women’s health.
Maternal Mortality: “The death of a woman within 42 days of termination of pregnancy, irrespective of the duration or site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.” (ICD-10)

Maternal Mortality Ratio:
- # Maternal deaths/100,000 live births in a given period of time
- What does the denominator miss?
MDG 5

- 5A: Reduce MMR by 75% between 1990 and 2015
- 5B: Achieve universal access to reproductive health by 2015
- Only achievable in combination with other MDGs
  - MDG #1 Eradicate extreme poverty
  - MDG #2 Education of women
  - MDG #3 Value of women in society as social and economic contributors

Robert Yates: DFID.gov.uk
Maternal mortality ratio, by country, 2005

Maternal deaths per 100,000 live births

- < 10
- 10 - 199
- 200-499
- 500-999
- ≥ 1000
- not available

MDG performance

Source: World Bank staff calculations based on data from the World Development Indicators database.

2011 World Bank Monitoring Report
Not Good Enough

No moms mean:

• No one to breastfeed
• No one to care for other kids
• No one to cook and maintain the family
• No one to care for sick
• Extremely high neonatal, infant, and childhood mortality for children of mothers who die

• YOU CANNOT ACHIEVE MDG 4!! (and arguably any other MDG)
How do maternal health and neonatal health intersect?

Major Causes of Maternal Mortality:

- Hemorrhage
- Hypertensive Disorders
- Obstructed Labor
- Sepsis
- Unsafe Abortion
Other causes of Maternal Mortality

- Anemia
- Embolism
- Ectopic Pregnancy
- Other direct or indirect causes
  - Malaria
  - HIV
  - Tetanus
- Unclassified deaths
  - Domestic Violence
CAUSES OF MATERNAL DEATH: A SYSTEMATIC REVIEW

The Lancet 2008; 367: 1066-74

- Evidence-based health policies and programmes aiming to reduce maternal deaths need reliable and valid information.
- We selected datasets using prespecified criteria, and recorded dataset characteristics, methodological features, and causes of maternal deaths.
- All analyses were restricted to datasets representative of populations.
- Haemorrhage and hypertensive disorders are major contributors to maternal deaths in developing countries.
- These data should inform evidence-based reproductive health-care policies and programmes at regional and national levels.
- Capacity-strengthening efforts to improve the quality of burden-of-disease studies will further validate future estimates.

HAEMORRHAGE as cause of maternal death

HYPERTENSIVE DISORDERS as cause of maternal death

SEPSIS OR INFECTION as cause of maternal death

ABORTION as cause of maternal death

UNICEF - UNFPA - WHO - World Bank
Special Programme of Research, Development and Research Training in Reproductive Health and Population
How pregnancy kills...

3 Delays:

- **First Delay**: Delay of woman and her family in seeking care in an emergency
- **Second Delay**: Physical, cultural, or financial constraints that prevent access to care
- **Third Delay**: Lack of skilled or effective interventions to treat the condition
Basic vs. Comprehensive EmOC

- **BASIC EMERGENCY OBSTETRIC CARE**
  - Parenteral Antibiotics, Oxytocics, anticonvulsants
  - Manual placental removal, retained products
  - Assisted delivery (vacuum, forceps)

- **COMPREHENSIVE EMERGENCY OBSTETRIC CARE**
  - Access to Cesarean section, hysterectomy
  - Blood banks, transfusions
Continuum of perinatal care

household to health system

Hemorrhage

Photo by Lisa Marshall
Pregnancy physiology:

- Maternal blood volume: 5-6 liters due to expansion of plasma volume in pregnancy
- >15% of cardiac output goes to pregnant uterus (~1liter/min)
- Normal blood loss for vaginal delivery <500cc
- After delivery the uterus contracts to mechanically close blood vessels within uterine wall
- What is the #1 cause/mechanism of hemorrhage?
# 1 cause of hemorrhage:

Uterine Atony
Other causes of hemorrhage

Peripartum:
- Obstructed labor, uterine rupture
- Infection/sepsis
- Lacerations (particularly in setting of FGM)
- Coagulopathy
- Placenta previa/abruption

Early pregnancy:
- Ectopic pregnancy
- Miscarriage/septic abortion
PPH: Diagnosis and Danger

- Fairly obvious?
- BRASSS-V drape
- Use of local garments
- ANY blood loss can be life threatening in setting of severe anemia
Condom catheter: uterine tamponade
Photo by Lisa Marshall
Side note: Female Genital Mutilation

- Affects 100-140 Million girls and women worldwide
- Health implications: UTI, Pelvic infections, pelvic pain, endometriosis, dyspareunia, cysts in scar tissue
- Recent Trends since anti-FGM legislation introduced:
  - Medicalization of procedure
  - Younger age at time of procedure
  - Fewer women choosing for daughters

En.wikipedia.org, WHO Female Genital Mutilation Fact Sheet, 2011
A. Normal

B. Type I

C. Type II

D. Type III

A. Prepuce removal only or B. Prepuce removal and partial or total removal of the clitoris.

Removal of part or all of the labia minora, with the labia majora sewn together, covering the urethra and vagina and leaving a small hole for urine and menstrual fluid.
21 yo primip 32 wks gestation presents with:

- Headache
- Hasn’t felt well for 2 days
- Nausea
- VS: T 37.6, 142/93, 92, 18, 94% RA
- Gen: NAD, RRR, CTA B, Abd mild RUQ ttp, Ext 1+ edema Bilat, 3+ reflexes
- UA: 2+ protein, ketones
**Hypertensive Disorders**

- Leading cause of Maternal Mortality in Latin America and the Caribbean
- Preeclampsia and Eclampsia
- Hypertension in pregnancy causing seizures, hypoxia, stroke, MI, blindness, liver, kidney, and clotting dysfunctions, death

http://www.nature.com/eye/journal/v20/n8/images/6702065f1.jpg
**Fast facts:**

**Symptoms:**
- HA, scotomata, RUQ pain

**Oliguria:**
- <30cc/hr x 2 hrs

**HELLP:**
- Hemolysis, Elevated Liver Enzymes, Low Platelets

**Treating Eclampsia:**
- Magnesium: 5g IM each buttock for seizures
- -OR- 4 g IV Load (30 min), 2g/hour continuous infusion
- BP meds safe in preg:
  - Labetolol 10mg IV q 10 min
  - Hydralazine 5mgIV q10 min
  - Nifedipine (if not on Magnesium)
- Antiseizure meds less effective
How do you manage preterm preeclampsia in a low resource setting?

Careful monitoring of blood pressure, Severe: >160/110, Mild >140/90

Labs if you can get them (CBC, Cr, AST, ALT, UricAcid)

Prior to viability/34 weeks carefully monitor, treat with BP meds (Labetolol, Nifedipine), bed rest in hospital

Betamethasone/ dexamethasone for FLM

Deliver if seizure, persistent oliguria, HELLP, or symptoms that persist despite tylenol
Child Brides

11 year old girl in Afghanistan preparing to marry 40 year old man
http://marcsteinerblog.wordpress.com/2008/02/21/221-child-brides-stolen-lives/
Obstructed Labor

• Caused by inadequate pelvic size for baby to deliver

  • Results from young age at pregnancy, malnutrition

• Without access to C/S women labor for days, baby dies and woman may die due to uterine rupture, hemorrhage or sepsis
Obstetric Fistula

- A few days later woman begins to leak urine or feces or both
  - Pressure necrosis of pelvis
  - Permanent incontinence
- 33,000 women in Sub-Saharan Africa per year
- Outcast from family and community
A. Vesicocervical
B. Juxtacervical
C. Midvaginal
vesicovaginal
D. Suburethral
vesicovaginal
E. Urethrovaginal
Treating obstructed labor

- Fistula treatment: Surgical repair by specially trained individual
- Treatment/Prevention: be able to offer C/S or facilitate access to C/S
  - Programs cataloging pregnant women in each village
  - Creating a delivery plan and emergency plan between HCW and women
  - Transportation
  - Education/warning signs
Community Transport Plan for Emergencies
19 yo woman presents with fever 3 days after vaginal delivery of liveborn infant

- Ill appearing female, NAD
- T 38.9, 96/60, 110, 24
- Pale, clammy skin, CV tachycardia, Lungs CTA, Abdomen TTP uterine fundus, foul smelling lochia, 1+ peripheral edema
- DDX?
Sepsis

• Urinary pathogens
  • UTI
  • Pyelonephritis
  • ARDS
• Pneumonia
• Post trauma infections
• Post abortal infections
• Sexually Transmitted Infections
  • Pueriperal infections
  • Chorioamnionitis
  • Endometritis

GH: Necrotic Uterus 2009: Rwanda
Unsafe Abortion

- Defined by WHO as “procedure for terminating an unintended pregnancy either by individuals without the necessary skills or in an environment that does not conform to minimum medical standards, or both”

- 1995 Estimates: 20 Million illegal abortions

- 97% of unsafe abortions occur in developing countries

- 68,000 women/yr die from unsafe abortions, millions are injured (8 women per hour)

- Studies have demonstrated repeatedly that abortion related deaths fall after legalization
Unsafe abortions worldwide

http://www.who.int/reproductive-health/unsafe-abortion/map.html
Complications of Unsafe Abortion

- *Clostridium perfringens* causing Gas Gangrene
- Bowel perforation by instruments causing sepsis
- Uterine perforation and hemorrhage
- Tetanus in unimmunized women, secondary to foreign body penetration
- Damage to reproductive tract, fistula formation
- Sex is not always a woman’s choice, especially where women are not valued
Prevention of Unsafe abortion: Legalization!!

The Romanian Natural Experiment

- Deaths Related to Abortion
- Deaths from Other Pregnancy Related Causes

Indirect Causes of Maternal Mortality

- Tetanus
- HIV
- Malaria
- DV
Tetanus

- Bacteria *Clostridium tetani*
- Spores universally present in soil
- Environmental exposure through any open skin/organ or dead tissue to spores
- Poverty, poor hygiene, lack of access to health services
- 110/160 developing countries eliminated NT to <1/1000 live births
Childhood Tetanus

Rwandan child with tetanus after a vaccination, photo by C. Nyquist MD, MPH
Preventing Tetanus

Immunize Pregnant Women + Clean Delivery and Umbilical Cord Care = Eradication of MN Tetanus
### Preventing Maternal and Neonatal Tetanus

**Cheapest:** Vaccinate pregnant women, 80% of women have adequate antibody levels after 2 doses

**Requires:** Antenatal Care structure

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### Table 1: Tetanus toxoid immunization schedule for women of childbearing age and pregnant women without previous exposure to TT, Td or DTP

<table>
<thead>
<tr>
<th>Dose of TT or Td (according to card or history)</th>
<th>When to give</th>
<th>Expected duration of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>At first contact or as early as possible in pregnancy</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>At least 4 weeks after TT1</td>
<td>1-3 years</td>
</tr>
<tr>
<td>3</td>
<td>At least 6 months after TT2 or during subsequent pregnancy</td>
<td>At least 5 years</td>
</tr>
<tr>
<td>4</td>
<td>At least one year after TT3 or during subsequent pregnancy</td>
<td>At least 10 years</td>
</tr>
<tr>
<td>5</td>
<td>At least one year after TT4 or during subsequent pregnancy</td>
<td>For all childbearing age years and possibly longer</td>
</tr>
</tbody>
</table>

Indirect causes of MM:

- HIV:
  - Immune suppression in setting of HIV increases morbidity of other ID (TB, anemia, HIV progression)
  - MM 4-5x higher in HIV infected mothers

Treating the indirect causes

- **HIV:**
  - Antenatal care, testing, treatment with ARVs
  - Maternal to child transmission prevention programs
  - Breastfeeding?
  - Careful monitoring for co-morbid illnesses

Site of MTCT projects, UN and Glaser Foundation

Sources: UNICEF, PMTCT News, No. 2, August 2001
Elizabeth Glaser Pediatric AIDS Foundation
Indirect Causes of MM: Malaria

- 30 Million preg/yr Sub-Saharan Africa
- Most severe maternal cases due to *Plasmodium falciparum*
- Increased risk of SAB, stillbirth, preterm birth and low birth weight infants
- Anemia
- 2-3x increased risk of severe malarial illness (Jaundice, HSM, hemolytic anemia, hyperpyrexia, hypoglycemia, pulmonary edema)
Malaria Prevention Measures

- Use of insecticide treated bed nets for mothers and newborns
- Intermittent preventive treatment (two doses of effective antimalarial during pregnancy)
- Large scale insect spraying, vector prevention
Additional Target Interventions:

- Widespread Health Facilities
- Skilled Birth Attendants
- Antenatal Care Delivery
- Emergency medical transport
- Surgical training for non-physicians
Skilled Birth Attendants: Education and Training

Photo by Lisa Marshall
Skilled birth attendants and Antepartum care

http://www.cafod.org.uk
WHO recommends 4 visits during pregnancy—3 after quickening

- Tetanus vaccination, iron supplementation, malaria prophylaxis
- Screening: STDs, anemia, malaria, bacteruria, malpresentation, diabetes, HTN, rubella, stress, DV
- Contraceptive education/family planning
- Bed net usage
- Emergency delivery plan
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Sources:


Google Images
Lets HOPE!!! Lets WORK!!!