

MOTHER

Maternal and Child Health L-2/23-24  
Maternal Mortality

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**While pregnancy should be a time of great hope and a positive experience for all women, it is tragically still a shockingly dangerous experience for millions around the world who lack access to high quality, respectful health care**

**When a woman dies in pregnancy, childbirth, or the postpartum period, it means there is an infant who will never know his or her mother. There is a tremendous sense of loss, grief, fear, and blame, as well as new, unexpected responsibility for the other parent and the family's extended community.**



There were an estimated **287,000** maternal deaths in 2020



Most were in low- and middle-income countries

A woman dies of pregnancy-related causes every



**2** minutes

Most of these deaths are preventable with the **right care** at the **right time**



## **Objectives :**

- Define maternal death**
- Describe the three delays model for maternal death**
- Classify the causes of maternal death**
- Identify the measures for maternal mortality.**
- Recall heads for prevention of maternal death, including Emergency obstetric care (EmOC)**

# What is a Maternal Mortality?

**It is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of duration and site of pregnancy from any cause related or aggravated by the pregnancy or its management and NOT due to any accidental or incidental cause.**

**Maternal death:** the death of a woman while pregnant, (or within 42 days of termination of pregnancy).

*Accidental or incidental causes of death are not classified as maternal deaths.*



**Maternal death:** the death of a woman while pregnant, (or within 42 days of termination of pregnancy).

*- irrespective of the duration and the site of the pregnancy*





# WHY DO WOMEN DIE?

**Maternal deaths occur when women with life – threatening complications do not have timely access to emergency obstetric care. The delays may occur at one or more stages.**



# Three Delays Model

- Identifies three groups of factors which may stop women and girls accessing the maternal health care they need

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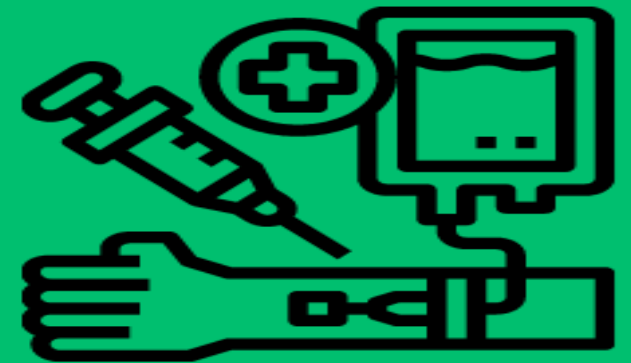
Recognising  
a need to  
seek care

2



Reaching  
facilities

3



Receiving  
care at  
facilities

## Delay 1

### Delay in decision to seek care due to

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- Warning signs.
- Poor understanding of complications and risk factors in pregnancy and when to seek medical help
- Ignorance of sexual and reproductive health right

## Delay 2

### Delay in reaching care due to

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- Request help and attention in a timely manner.
- Distance to health centres and hospitals, poor roads and infrastructure
- Delay in the search for care by the pregnant woman.

## Delay 3

### Delay in receiving adequate health care due to

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- Delay in the availability and cost of transportation
- Poor facilities and lack of medical supplies
- Inadequately trained and poorly motivated medical staff. Inadequate referral systems

## Delay 4

### Lacks in quality health care

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- Events that cause poor attention in health services.
- Medical act and / or inadequate administrative work.



## Factors affecting utilisation and outcome

Socioeconomic and cultural factors

Accessibility of facilities

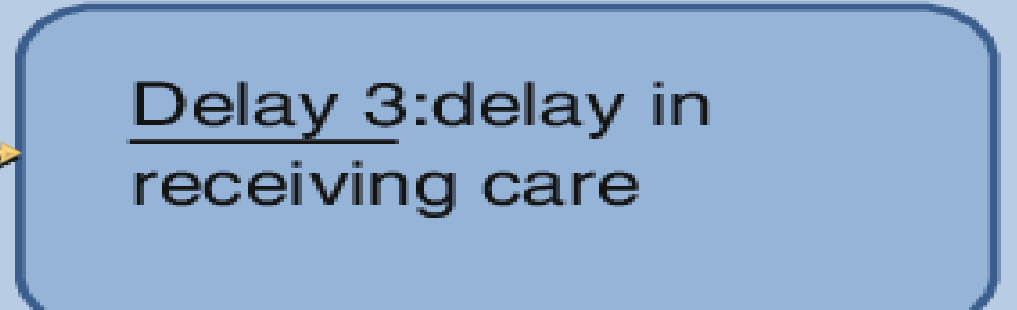
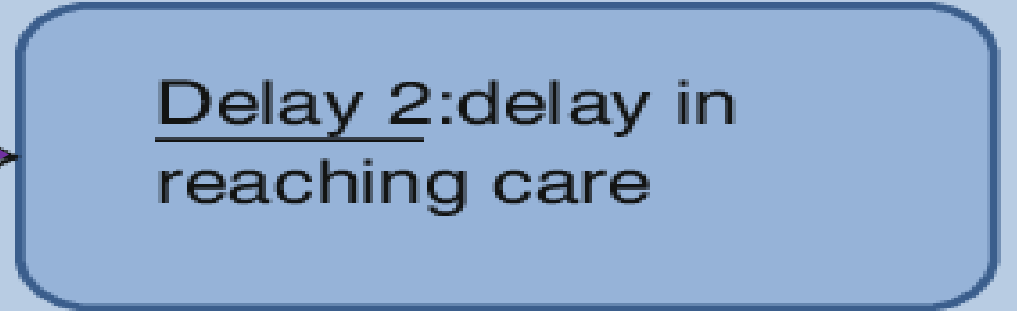
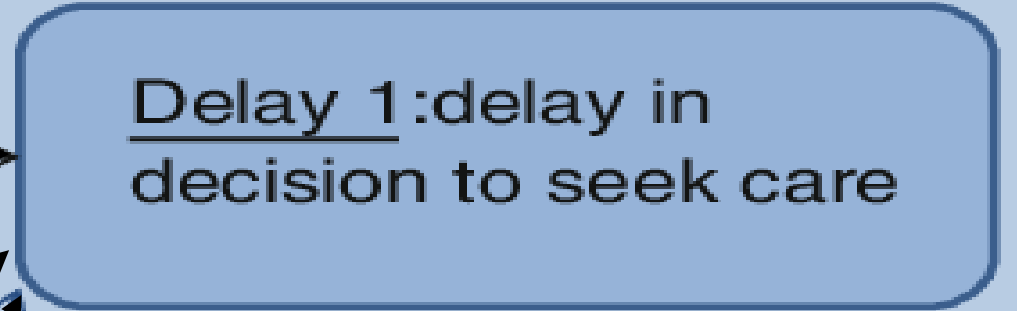
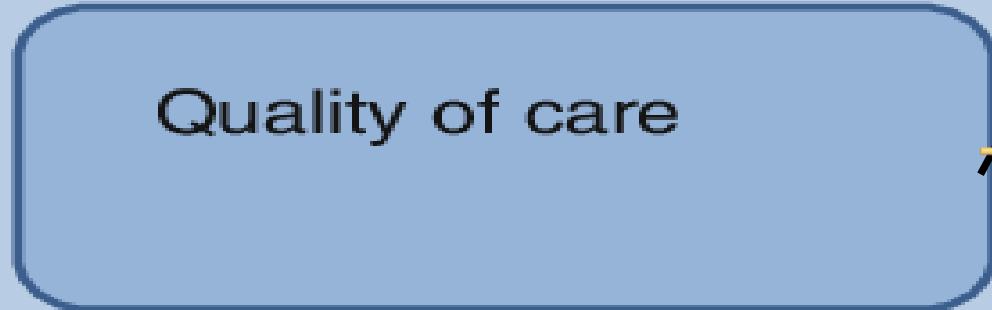
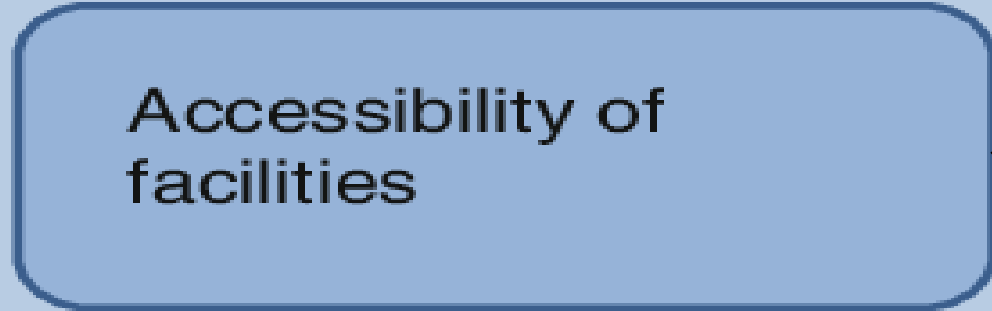
Quality of care

## Phases of delay

Delay 1: delay in decision to seek care

Delay 2: delay in reaching care

Delay 3: delay in receiving care



- **D1 Delay in decision to seek care due to (socioeconomic and cultural factors :**
  - 1- Lack of understanding of complications**
  - 2- Acceptance of maternal death**
  - 3- Low status of women**
  - 4- Socio-cultural barriers to seeking care**
  - 5- Previous poor experience of health care**
  - 6- Financial implications**

## **D2**

- **Delay in reaching an institution that can provide emergency obstetric care [EmOC]. Due to**

**1-Distance to health centers and hospitals**

**2-Availability of and cost of transportation**

**3-Poor roads and infrastructure**

**4-Geography e.g. mountainous land, rivers.**



**D3 - Delay in receiving adequate health care due to**

**1-Poor facilities and lack of medical supplies**

**2-Inadequately trained and poorly motivated medical staff**

**3-Inadequate referral systems**

## **Solution for D1**

- **Training community health workers and birth attendants**

## **Solution for D2**

- **Providing reliable transportation and referral system .**

## **Solution for D3**

- **Setting up health facilities with trained personnel and equipments.**

**Women die as a result of complications during and following pregnancy and childbirth.**

**Most of these complications develop during pregnancy.**

**Other complications may exist before pregnancy but are worsened during pregnancy.**



**Factors Identified in maternal mortality are categorized into four groups :**

**1. Reproductive Factors**

**2. Obstetric Complications**

**3. Health Service Factors**

**4. Socioeconomic Factors**

# **1.Reproductive Factors include**

## **☐ Maternal age**

**Young adolescents (ages 10-14) face a higher risk of complications and death as a result of pregnancy than other women.**

## **☐ Parity**

## **☐ Unwanted Pregnancy**

## **2-Obstetric Complications**

- 1-Hemorrhage : APH,PPH, Spontaneous abortion**
- 2- Ectopic pregnancy**
- 3- Multiple pregnancy**
- 4- Puerperal infection**
- 5- Toxemia**
- 6- Obstructed labour**
- 7- Induced abortion**



### **3-Health Service Factors**

- **Lack of access to maternity services**
- **Poor medical care**
- **Inadequate trained personnel**
- **Lack of essential supplies :drugs , Instruments .**

## **4-Socioeconomic Factors**

### **A. Status of women**

- **Low status**
- **Gender discrimination**
- **Unequal opportunity for nutrition , health , education**

### **B. Cultural practice**

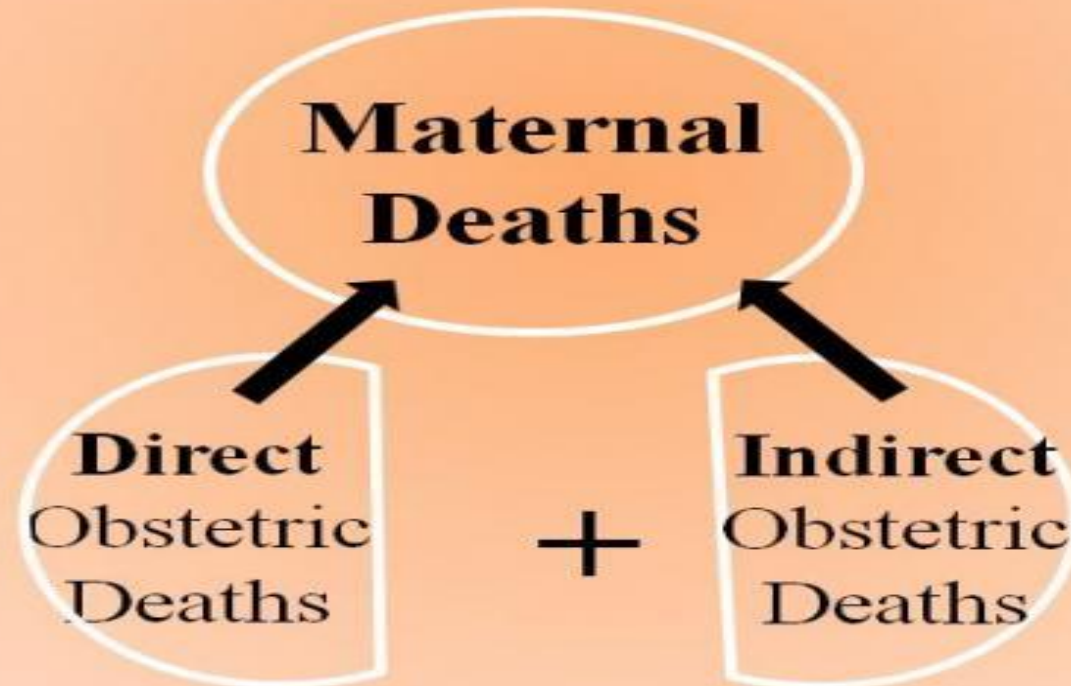
- **Cultural acceptance of large family**
- **Social status and NO. of children**
- **Traditional preference for boys**

**C-Requirement of permission to go to health care facility from husband or mother in law.**

# CAUSES OF MATERNAL DEATH

**Maternal death:** the death of a woman while pregnant, (or within 42 days of termination of pregnancy).

*- All maternal deaths are either direct obstetric deaths or indirect obstetric deaths*



# Direct Causes of MM

**Direct Obstetric Death:** those deaths resulting from:

- obstetric complications of the pregnant state (pregnancy, labor and post-partum)
- interventions, omissions, or incorrect treatment
- or from a chain of events resulting from any of the above.



**Deaths due to, for example, hemorrhage, pre-eclampsia/ eclampsia or those due to complications of anaesthesia or Caesarean section are classified as direct obstetric deaths, they are usually due to:**

**one of five major causes- hemorrhage( usually occurring post partum), sepsis, eclampsia, obstructed labour, or complications of unsafe abortion.**

**These are all largely preventable and treatable with access to high-quality and respectful healthcare.**

**PPH is responsible for approximately 27 percent of all maternal deaths.**

**Hypertensive disorders are responsible for 14 percent of pregnancy-related deaths.**

**About 11 percent of maternal deaths are the result of an infection.**

**Termination of pregnancy accounts for 8 percent of the maternal deaths.**

**About 3 percent of maternal deaths are due to a pulmonary embolism.**



## **Other Direct Complications**

**Approximately 10 percent of women die from other direct pregnancy-related issues. Conditions such as placenta previa, uterine rupture, and ectopic pregnancy can lead to complications and death without the proper care and treatment.**

**In developing countries [ $\frac{3}{4}$ ] of maternal deaths are due to direct causes.**

# Indirect Causes of MM

**Indirect Obstetric Death:** those deaths resulting from previous existing disease (or from a disease that developed during pregnancy) and which was *not* due to **direct obstetric causes**, but which was *aggravated by* physiologic effects of pregnancy.



**Deaths due to aggravation of an existing cardiac or renal disease, malaria and anemia are indirect obstetric deaths.**

**On average, [1/4] of maternal deaths in developing countries are classified as indirect causes.**

**Almost half of all postpartum deaths take place within one day of delivery and 70% within 1st week .**

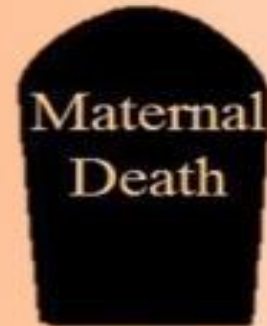
**According to WHO, In Iraq the main reasons for maternal death are:**

- Poor birth practices**
- Inadequate referral and emergency obstetric care**
- High level of anaemia among pregnant women**

**Measures of Maternal Mortality: the number of maternal deaths in a population is essentially the product of two factors: the risk of mortality associated with a single pregnancy or a single live birth, and the number of pregnancies or births that are experienced by woman of reproductive age.**

**Maternal mortality ratio:**  
the number of maternal  
deaths per *live births*

**Numerator:** Maternal deaths



**Denominator:** Live births



## **The Maternal Mortality Ratio (MMR)**

**is defined as the number of maternal deaths in a population divided by the number of live births [per 100000]**

**It is representing the risk associated with each pregnancy, it is the obstetric risk.**

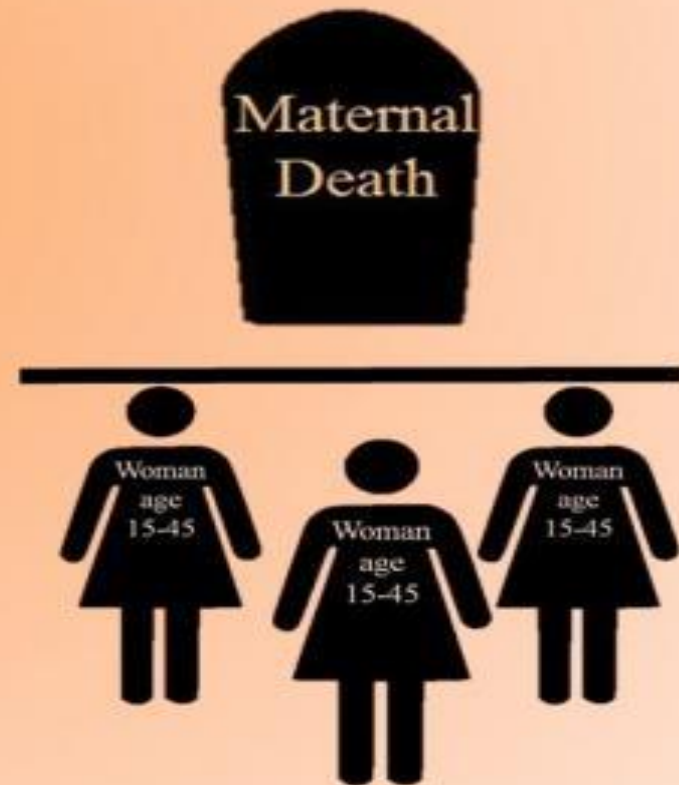


# Maternal mortality rate:

the number of maternal deaths in a given period per population of *women who are of reproductive age*

**Numerator:** Maternal deaths

**Denominator:** Women of reproductive age



## **The Maternal Mortality Rate**

**Is defined as the number of maternal deaths in a population divided by the number of women of reproductive age( usually 15-49years)[ per 100000]**

**Measured both the (obstetric risk) and the (frequency with which women are exposed to this risk) as well as the (level of fertility in the population).**

# Lifetime risk of maternal death:

The cumulative probability over your whole life of becoming pregnant *and* of dying from the pregnancy.

$$= \text{Summation over all ages of } \left( \begin{array}{c} \text{Age-} \\ \text{specific} \\ \text{chance of:} \end{array} \right) \times \left( \begin{array}{c} \text{Age-} \\ \text{specific} \\ \text{chance of:} \end{array} \right) \text{ Maternal Death}$$


# **Adult lifetime risk of maternal death**

**The lifetime risk of maternal death is the probability that a 15-year-old girl will die from complications of pregnancy or childbirth over her lifetime; it takes into account both the maternal mortality ratio and the total fertility rate (average number of births per woman during her reproductive years under current age-specific fertility rates).**

**Women in developing countries have on average many more pregnancies than women in developed countries, and their lifetime risk of death due to pregnancy is higher.**

**the lifetime risk of maternal death varies largely across countries. In 2020, the lifetime risk of maternal death in low income countries as a whole was 1 in 49, compared to 1 in 5,300 in high-income countries.**

**A late maternal death is “the death of a woman from direct or indirect obstetric causes, more than 42 days but less than one year after termination of pregnancy”.**

- **Like maternal deaths, late maternal deaths also include both direct and indirect maternal/obstetric deaths.**
- **Complications of pregnancy or childbirth can lead to death beyond the six-week (42-day) postpartum period**

**Between 2000 and 2017, the maternal mortality ratio dropped by about 38% worldwide.**

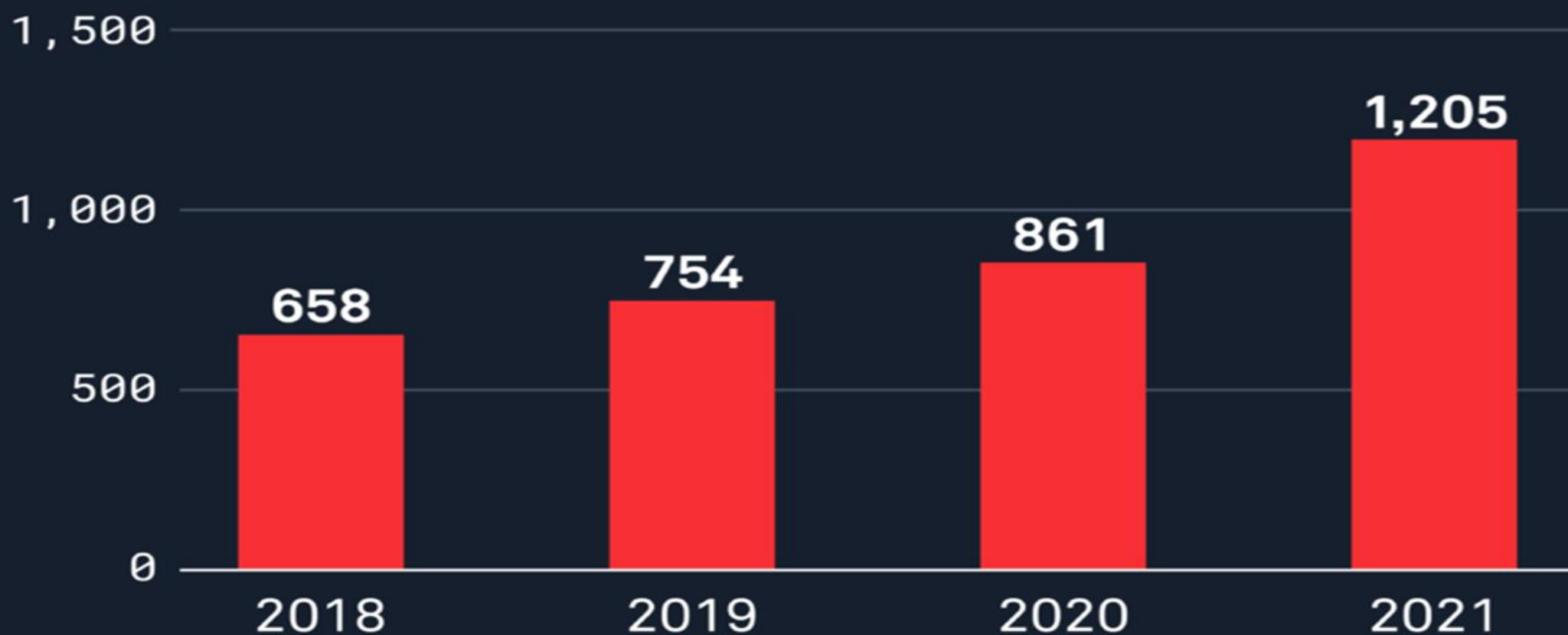
**94% of all maternal deaths occur in low and lower middle-income countries.**

**Between 2016 and 2030, as part of the Sustainable Development Goals, the target is to reduce the global maternal mortality ratio to less than 70 per 100 000 live births.**



# U.S. maternal mortality increased sharply in 2021

## U.S. deaths with maternal causes



Source: Centers for Disease Control and Prevention

## Near miss

**World Health Organization (WHO) defines the criterion of **severe maternal morbidity or Maternal Near Miss (MNM)** as a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within six weeks after pregnancy**

**The incidence of MNM varied widely from 3.9 to 379.5 per 1000 live births and 7.6-60.4 per 1000 deliveries.**

# **Maternal Mortality Reduction: Targets**

- **Primary prevention**
  - **Reduce unwanted pregnancies**
- **Secondary prevention**
  - **Reduce obstetric complications**
- **Tertiary prevention**
  - **Reduce death after complications occur**
  - **“3 delays” – decide to seek care, access to care, quality / timeliness of care**

**Maternal mortality can greatly be reduced by ensuring prompt and quality obstetric care services supported with an equally effective family planning services.**

How obstetric care services and family planning services can reduce maternal mortality?

- ❑ **Family planning services reduces mortality through reduction in proportion in high risk , unwanted , untimed , too early and to many pregnancies.**
- ❑ **Good obsteteric care : reduces mortility and morbidity arising from complications during pregnancy and child birth.**
- ❑ **As many of these complications are unpredectible , may occur at any time during pregnancy , child birth and post partum period----- **Obstetric emergancies****



# Obstetric emergencies DEFINES AS:

- > are life threatening medical conditions that occur in pregnancy or during or after labor and delivery.

□ **Therefore every woman , irrespective of her risk status , may require emergency obstetric care (EmOC)**





- ❑ **Emergency obstetric care (EmOC)** refers to the care of women and newborns during pregnancy, delivery and the time after delivery.

**Women in emergency situations must have access to EmOC, as it is essential to saving lives everywhere in the world.**

### **Components of basic EmOC include:**

- ❖ **Treatment for sepsis**
- ❖ **Treatment for eclampsia**
- ❖ **Treatment for prolonged or obstructed labour**
- ❖ **Post-abortion care (PAC)**
- ❖ **Treatment for incomplete miscarriage**
- ❖ **Removal of the placenta**
- ❖ **Assisted delivery using forceps or suction**
- ❖ **New born care**

**Comprehensive EmOC services include** the services listed above, in addition to:

- ❖ **Surgery (specifically, Caesarean section)**
- ❖ **Anesthesia**
- ❖ **Safe blood transfusion observing universal HIV precautions**
- ❖ **Care to the sick and LBW new borns**

## Emergency Obstetric and Neonatal Care

### BASIC

- **Antibiotics IV**
- **Oxytocics IV**
- **Anticonvulsivant**
- **Manual removal of placenta**
- **Post abortion care (MVA)**
- **Assisted vaginal delivery (vacuum extraction)**
- **Newborn care**

### COMPREHENSIVE *all Basics plus:*

- **Surgery (caesarean - section)**
- **Blood transfusion**
- **Care to the sick and LBW newborns**



# Preventing Maternal Deaths

**The 5 steps that a physician can take to prevent many maternal deaths are :**

- 1. Provide good antenatal care.**
- 2. Conduct/supervise delivery in clean safe environment by a trained birth attendant.**
- 3. Prevent prolonged labor; refer early any delay in labor (in primi gravida beyond 12 hours, and in multi parae delay beyond 8 hours) for appropriate management.**
- 4. Provide emergency care on time to women with postpartum bleeding and refer them early to hospital, (good referral system)**
- 5. Counsel couples on adopting contraception to avoid unnecessary pregnancies through contraception rather than taking route to unsafe abortion.**

## Maternal deaths

### Potentiating factors

- Poor antenatal care
- Poor infrastructure
- Lack of skilled personnel
- Poor transport facilities
- Delayed referrals

Near miss

General pregnant population

### Correctable measures

- ✓ Good antenatal care
- ✓ Early identification of risk factors
- ✓ Timely delivery
- ✓ Magnesium sulphate for prophylaxis of eclampsia
- ✓ Good blood bank facilities





ANY QUESTION ?

**References :**

**1-Trends in maternal mortality: 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva: World Health Organization; 2019.**

**2-Levels and trends in child mortality report 2019**

**Estimates developed by the UN Inter-agency Group for Child Mortality Estimation**

**Authors:**

**UNICEF, WHO, World Bank, UN-DESA Population Division**