Maternal and Child Health L-2/24-25

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Objectives :

- Define maternal morbidity

-Define maternal death

- Describe the fourth 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)

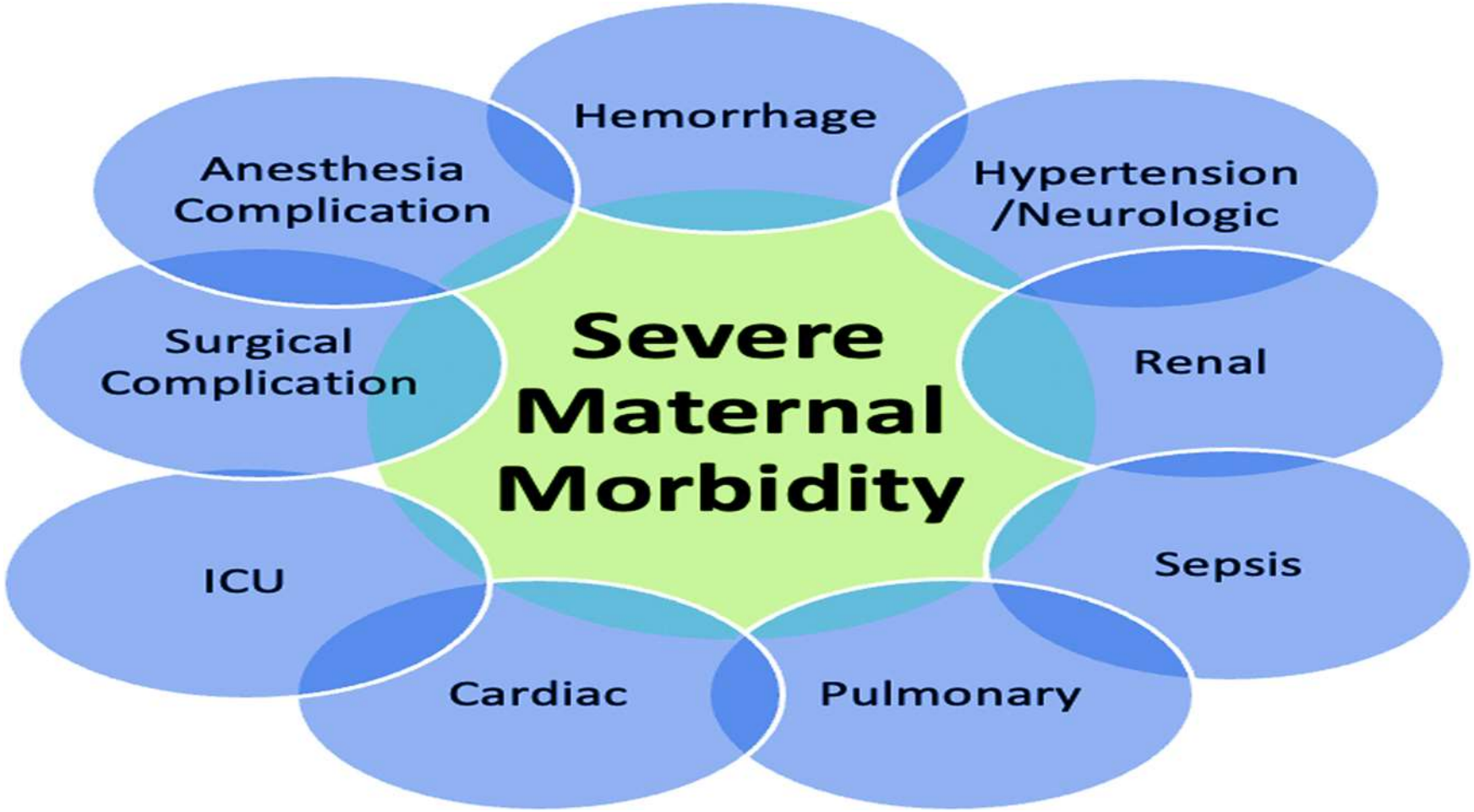
While pregnancy should be a time of great hope and a positive experience for all women, it is tragically still a shockingly dangerous experience for millions around the world who lack access to high quality, respectful health care

Maternal morbidity includes a range of different health conditions. Some of them start during pregnancy and last only a short time, while others do not develop until years after a pregnancy and continue throughout the woman's life.

Some common examples of maternal morbidity include the following:

- Cardiovascular problems, such as heart disease and blood vessel problems
- Diabetes
- High blood pressure
- Infections, especially from cesarean section
- Blood clots
- Hemorrhage
- Anemia
- Nausea and vomiting (morning sickness) and hyperemesis gravid arum (severe morning sickness)
- Depression and anxiety

Severe maternal morbidity (SMM) includes unexpected outcomes of labor and delivery that can result in significant short- or long-term health consequences. SMM has been steadily increasing in recent years.



Some SMM examples include heart attack, heart failure, eclampsia, sepsis/blood infection, and hysterectomy. If a woman needs breathing assistance, such as a ventilator, or needs a blood transfusion, it is also considered SMM.

How to measure severe maternal morbidity?

It is recommend using two criteria to screen for severe maternal morbidity:

1- **Transfusion of 4 or more units of blood**
2- **Admission of a pregnant or postpartum woman to an ICU.**

What is the maternal near-miss concept?

Maternal near-miss (MNM) is defined by the World Health Organization (WHO) working group as a woman who nearly died but survived a life-threatening condition during pregnancy, childbirth, or within 42 days of termination of pregnancy due to getting quality of care or by chance.

Its primary causes : are hemorrhage, hypertensive disorders of pregnancy, postpartum sepsis, obstructed labor, uterine rupture, abortion, and anemia

The near-miss approach is comprehensive and works on the concept of standard-based clinical audit, which is considered a practical and beneficial method of auditing the quality of maternal health care

It assumes that women who survived life-threatening complications related to pregnancy and childbirth had many similarities with those who died

The ultimate goal of the near-miss approach is to improvement in clinical practice and reduce preventable morbidity and mortality using the best evidence-based practices

The global estimated figure of near-miss in 2022 was 18.67/1000 LB, with continental variations; 3.10/1000 in Europe to 31.88/1000 LB in Africa.


MOTHER

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**

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SUSTAINABLE DEVELOPMENT GOALS

#HealthForAll

A woman dies of pregnancy-related causes every

minutes

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

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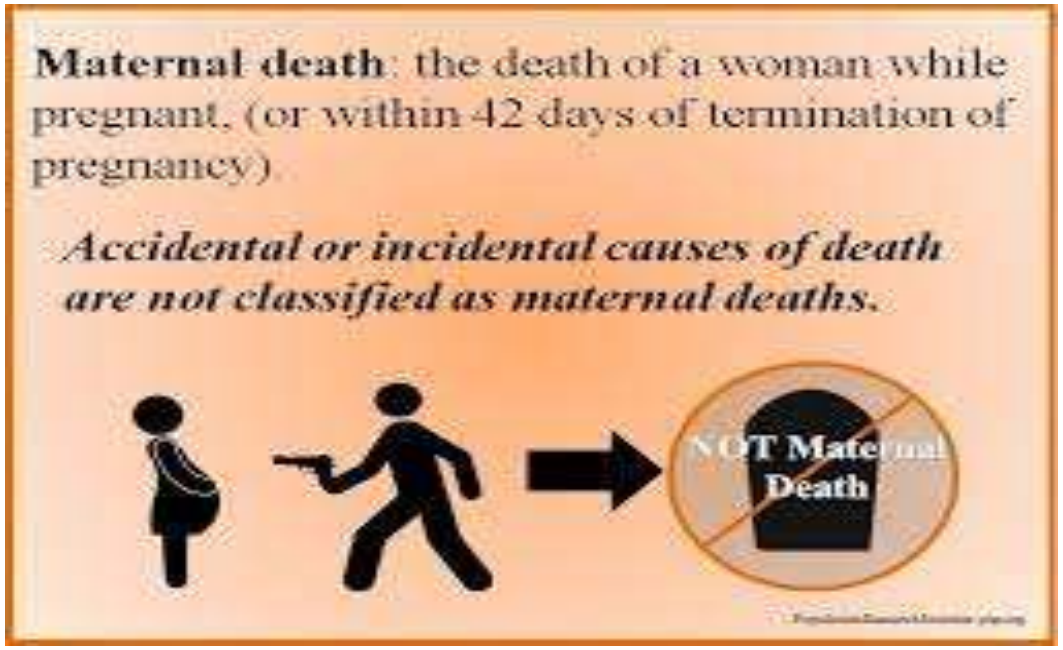
SUSTAINABLE DEVELOPMENT GOALS

#HealthForAll

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 <u>NOT</u> due to any accidental or incidental cause.



A pregnancy-related death

Is defined as a death during pregnancy or within 1 year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy. The death may happen because:

- ❑ **The pregnancy causes a new medical (including mental) health problem.**
- ❑ **The pregnancy starts a chain of events that lead to death.**
- ❑ **The pregnancy makes an unrelated condition worse.**

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**

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**

- **D1Delay in decision to seek care**

which includes:

1- Socio-cultural factors such as recognition of complications and perceived severity of illness, the factors involved in decision-making and the status of women

2- Perceived accessibility around distance, transport and the associated costs

3- Perceived quality of care.

D2 Delay in reaching an institution that can provide emergency obstetric care [EmOC].

The second delay is in identifying and reaching a health facility, which includes issues around

1-Distribution and location of facilities

2- Distance and travel time

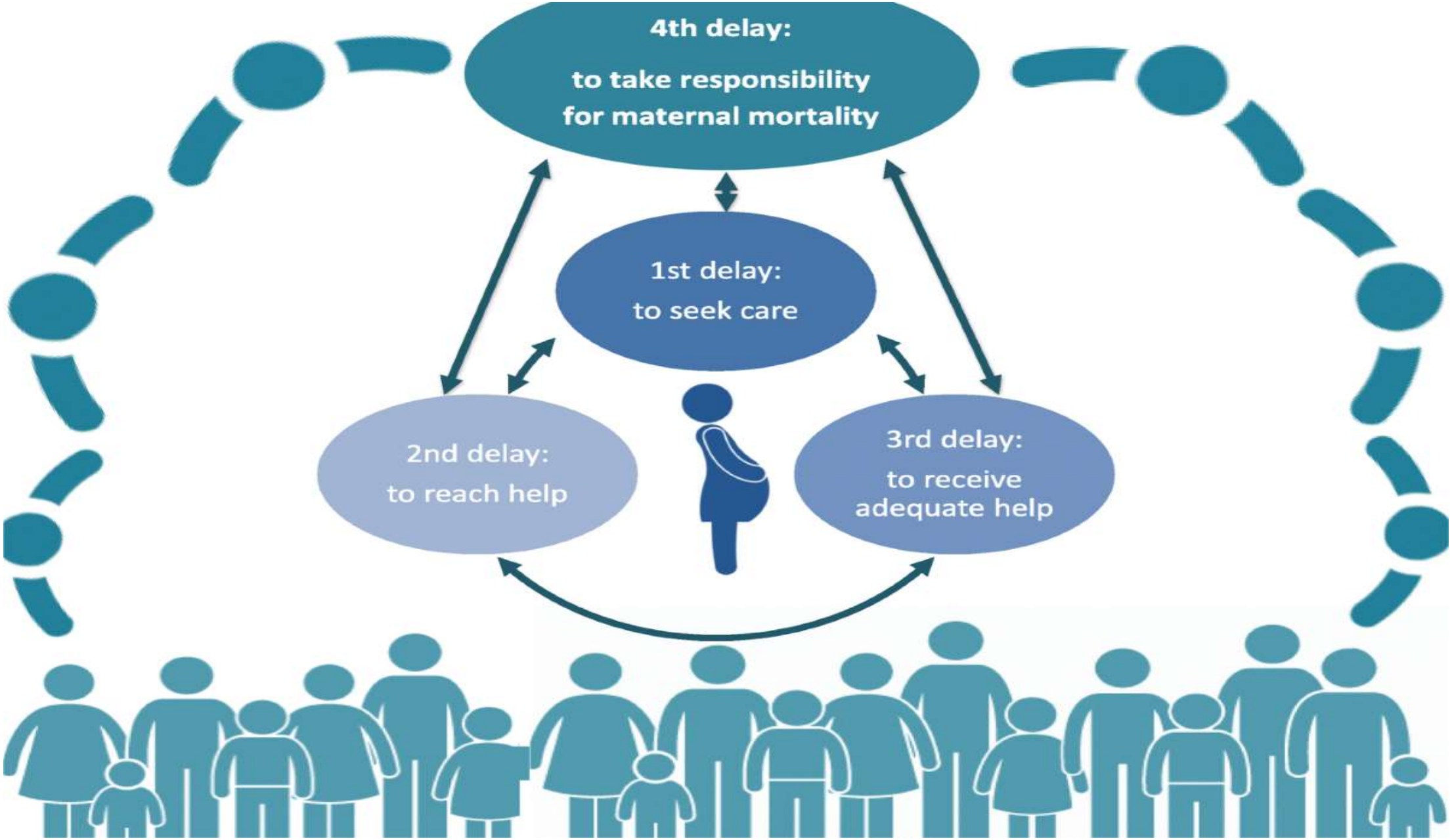
3- Availability of transport and road conditions

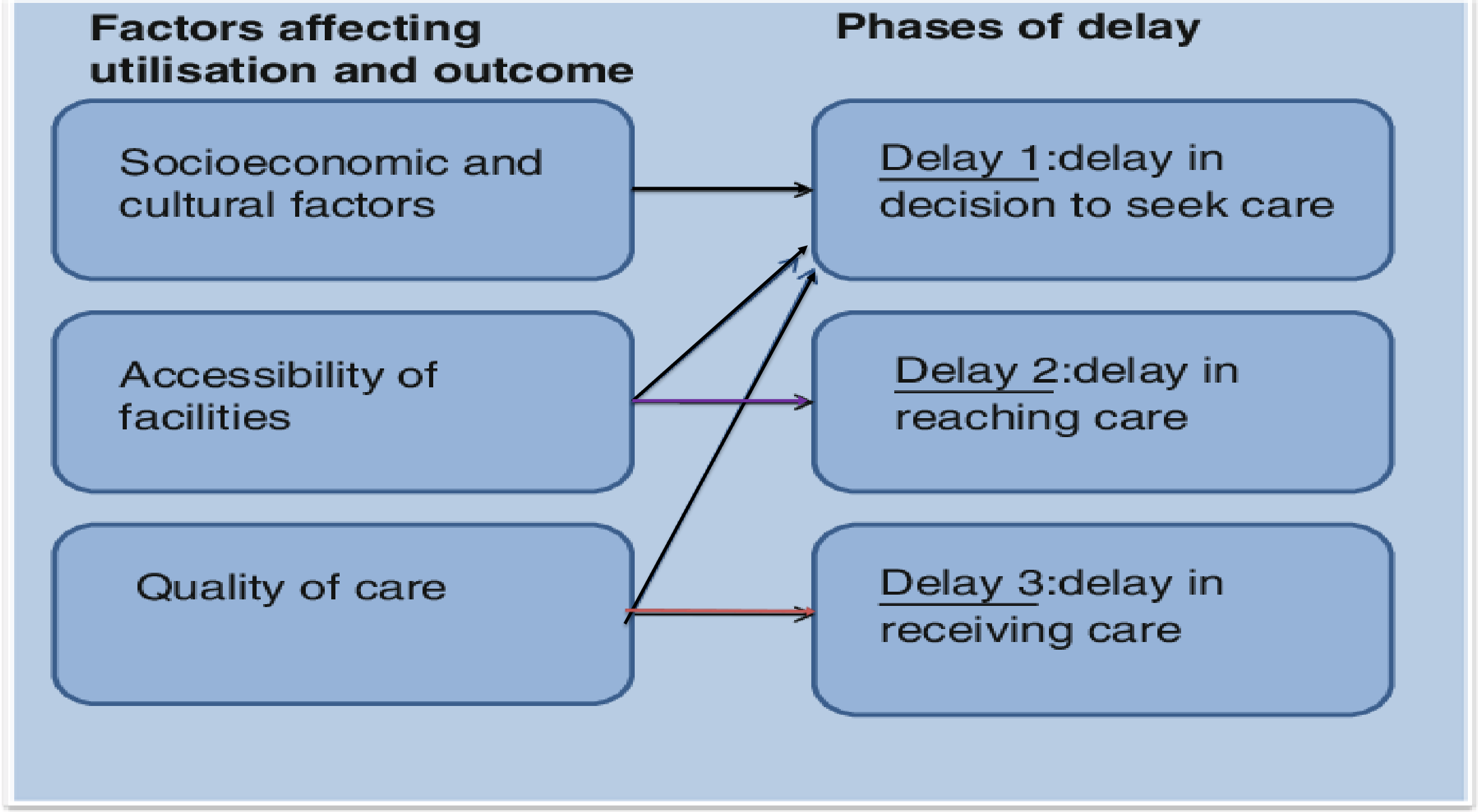
4- Costs of transport.

D3 - Delay in receiving adequate health care

The third delay is receiving adequate care at the facility, which includes issues around
1-Poorly staffed facilities and competence of personnel
2- Shortages of supplies and equipment
3-Inadequate management.

D4 -fourth delay to include the community's role in preventing maternal deaths and collective engagement to mobilize resources


4th delay:
to take responsibility
for maternal mortality
1st delay:
to seek care
2nd delay:
to reach help
3rd delay:
to receive
adequate help


Factors affecting utilisation and outcome
Phases of delay
Socioeconomic and cultural factors
Accessibility of facilities
Quality of care
Delay 1:delay in decision to seek care
Delay 2:delay in reaching care
Delay 3:delay in receiving care

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-Hemmorrhage : 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

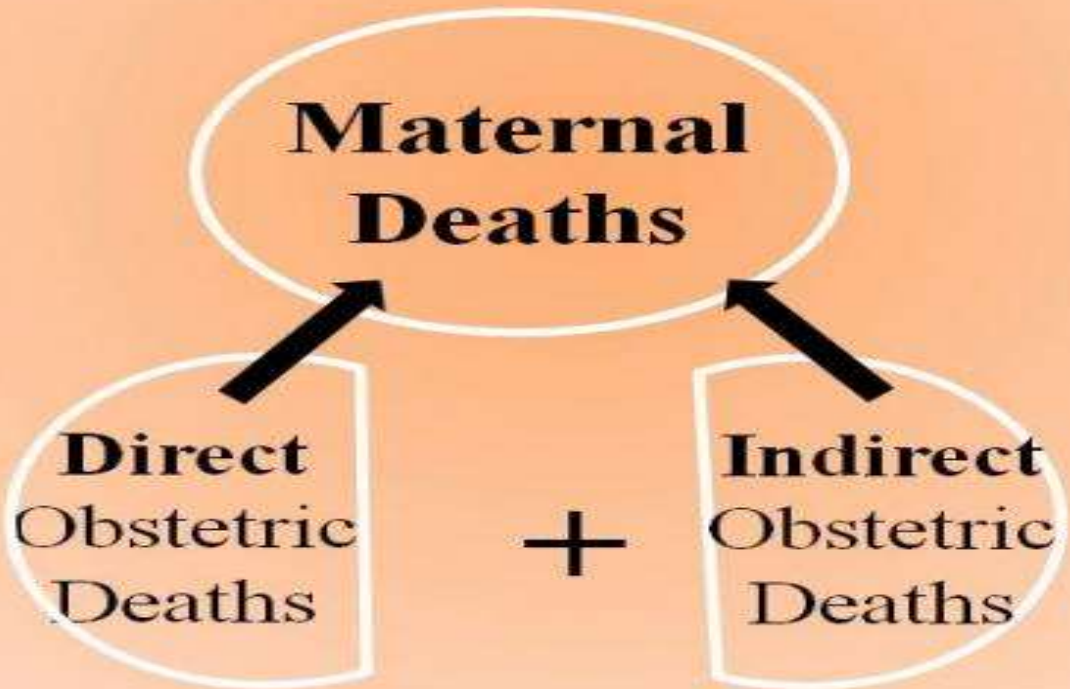
- Cultural acceptance of large family
- Social status and NO. of children
- Traditional preference for boys

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

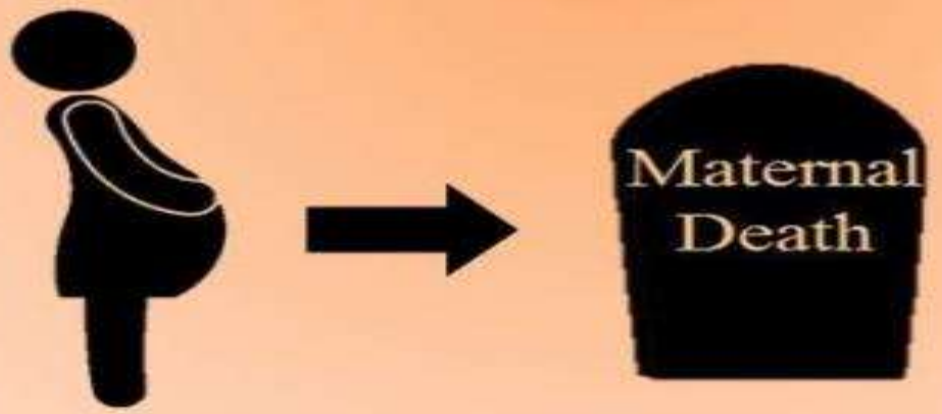


Population Research Institute: pop.org

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.



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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 [¾] 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.

Population Research Institute: pop.org

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

On average, [¼] 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**

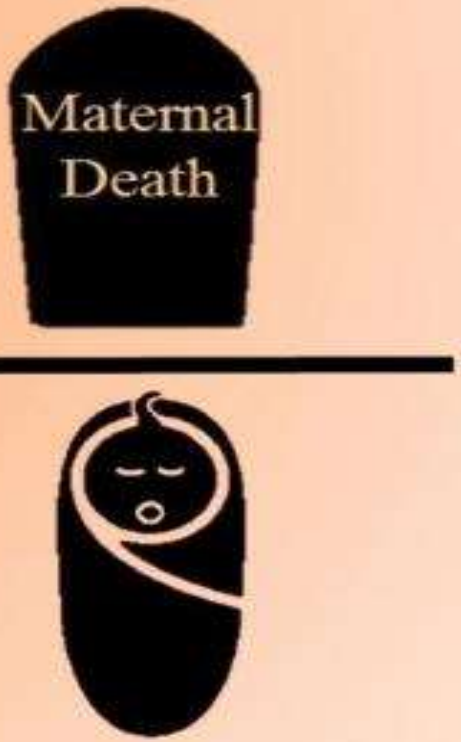
Statistical measures of maternal mortality

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



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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]

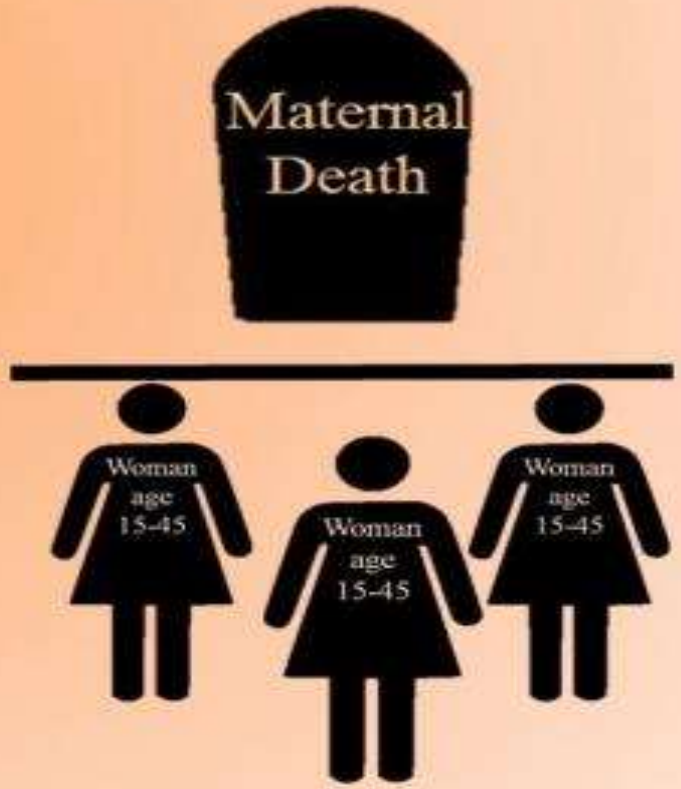
It is representing the risk associated with each pregnancy, it is the obstetric risk.

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



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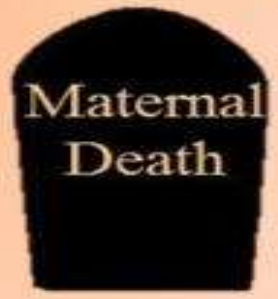
The Maternal Mortality Rate

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.

$$= \text{Summation over all ages of } \left(\text{Age-specific chance of: } \text{  } \times \text{Age-specific chance of: } \text{  } \right)$$

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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.

The proportion of deaths among women of reproductive age that are due to maternal causes (PM) :The number of maternal deaths in a given time period divided by the total deaths among women aged 15–49 years.

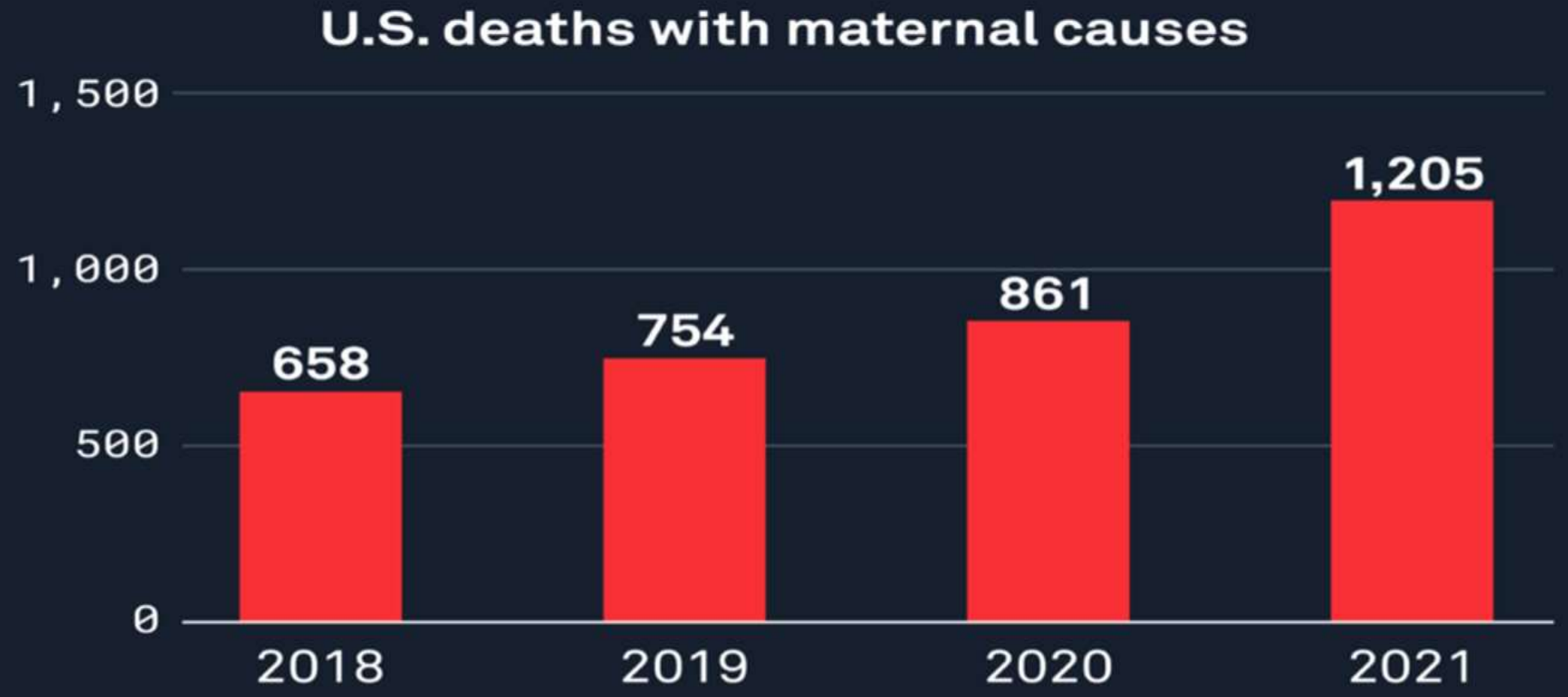
Between 2000 and 2017, the maternal mortality ratio dropped by about 38% worldwide.
94% of all maternal deaths occur in low and lower middle-income countries.

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.

76 women die per 100,000 live births due to pregnancy-related causes in Iraq
The maternal mortality ratio in Iraq has improved from 117 in 2000 to 76 in 2020. Maternal mortality in Iraq is higher than its regional average.

U.S. maternal mortality increased sharply in 2021

PBS NEWS HOUR



Source: Centers for Disease Control and Prevention

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 emergancy 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 born**

Emergency Obstetric and Neonatal Care

UNFPA

BASIC

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

COMPREHENSIVE

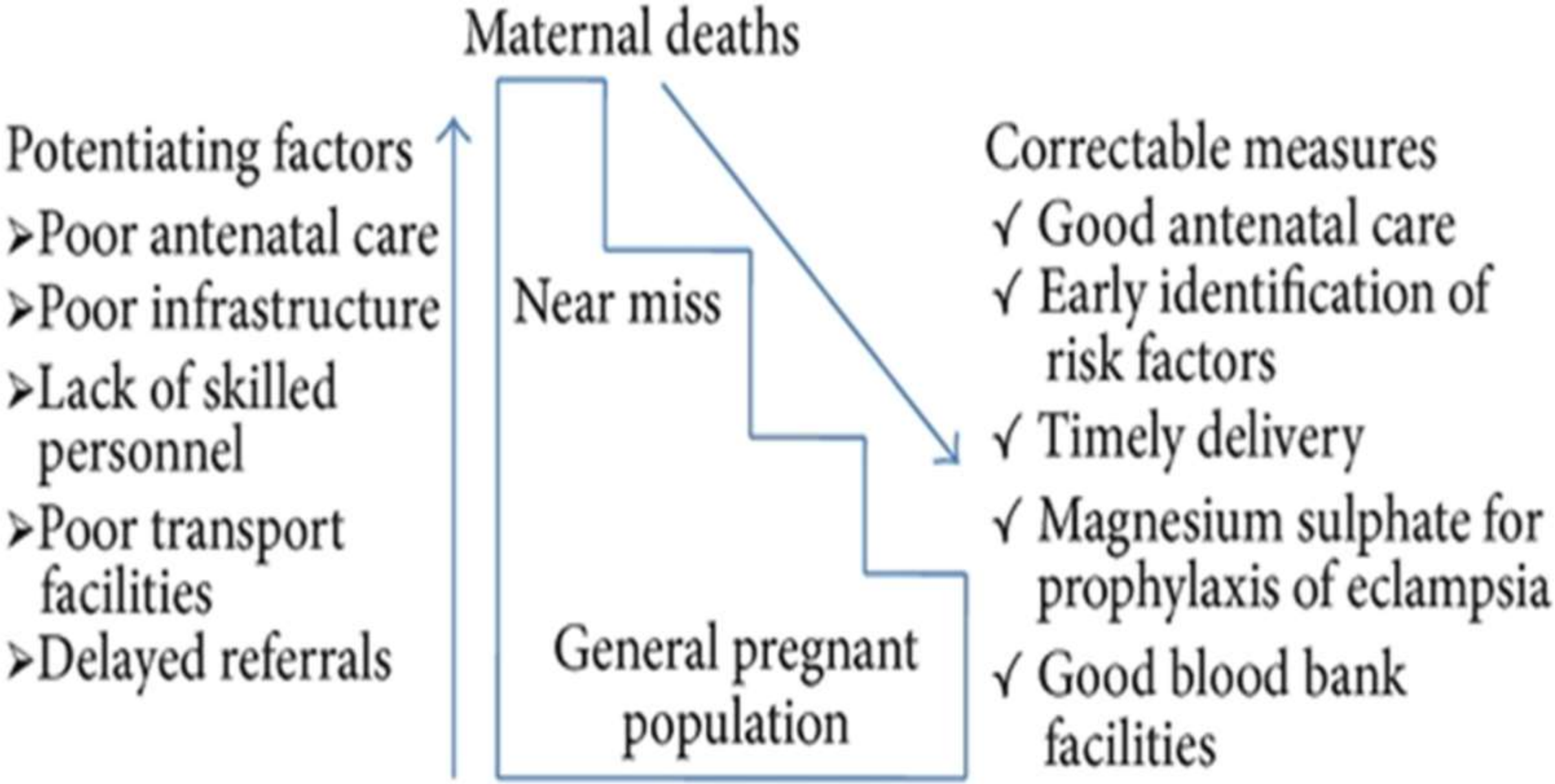
all Basics plus:

- 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

3-Road to maternal death: the pooled estimate of maternal near-miss, its primary causes and determinants in Africa: a systematic review and meta-analysis

https://bmcpregnancychildbirth.biomedcentral.com/24, Article number: 144 (2024)