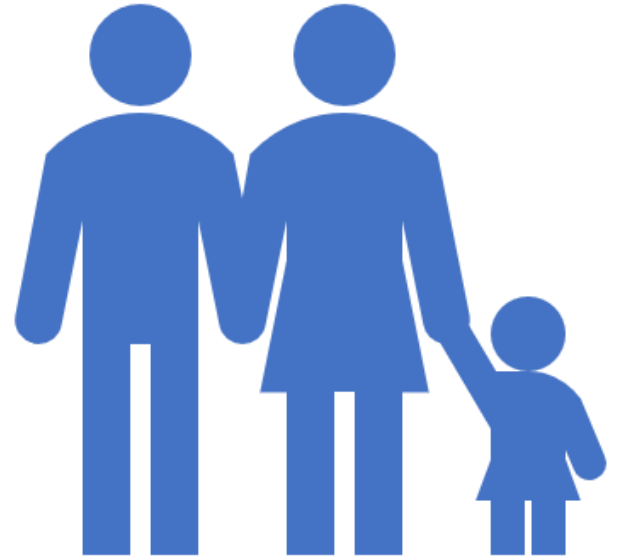# Maternal Health

Definitions

- **Maternal health:** refers to the health of women during pregnancy, childbirth and the postpartum period.

- **Health indicators:** a measurable characteristic that describes the health of a population (e.g., life expectancy, mortality, disease incidence or prevalence, or other health states)
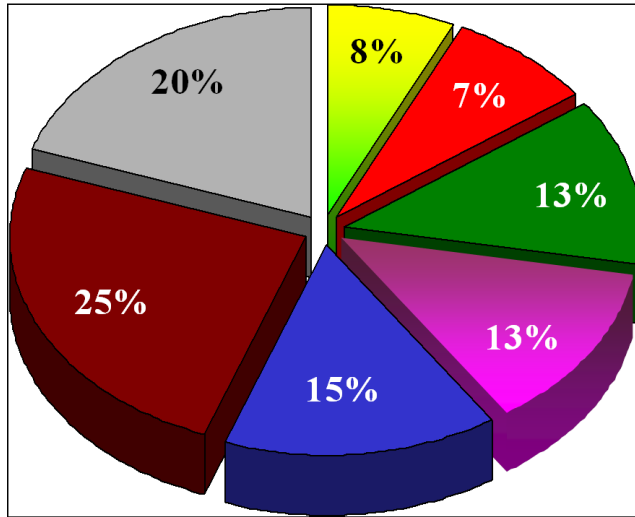
World Health Organization

Fact 1

Nearly 830 women die every day due to complications during pregnancy and childbirth.

Fact 2

Women die in pregnancy and childbirth for 5 main reasons

MAJOR CAUSES OF MATERNAL MORTALITY:

Facts:

Fact 3

More than 135 million women give birth per year

About 20 million of them are estimated to experience pregnancy-related illness after childbirth. The list of morbidities is long and diverse, and includes fever, anaemia, fistula, incontinence, infertility and depression. Women who suffer from fistula are often stigmatized and ostracized by their husbands, families and communities.

Fact 4

About 16 million girls aged between 15 and 19 give birth each year

They account for more than 10% of all births. In the developing world, about 90% of the births to adolescents occur in marriage. In low- and middle-income countries, complications from pregnancy and childbirth are the leading cause of death among girls 15-19.
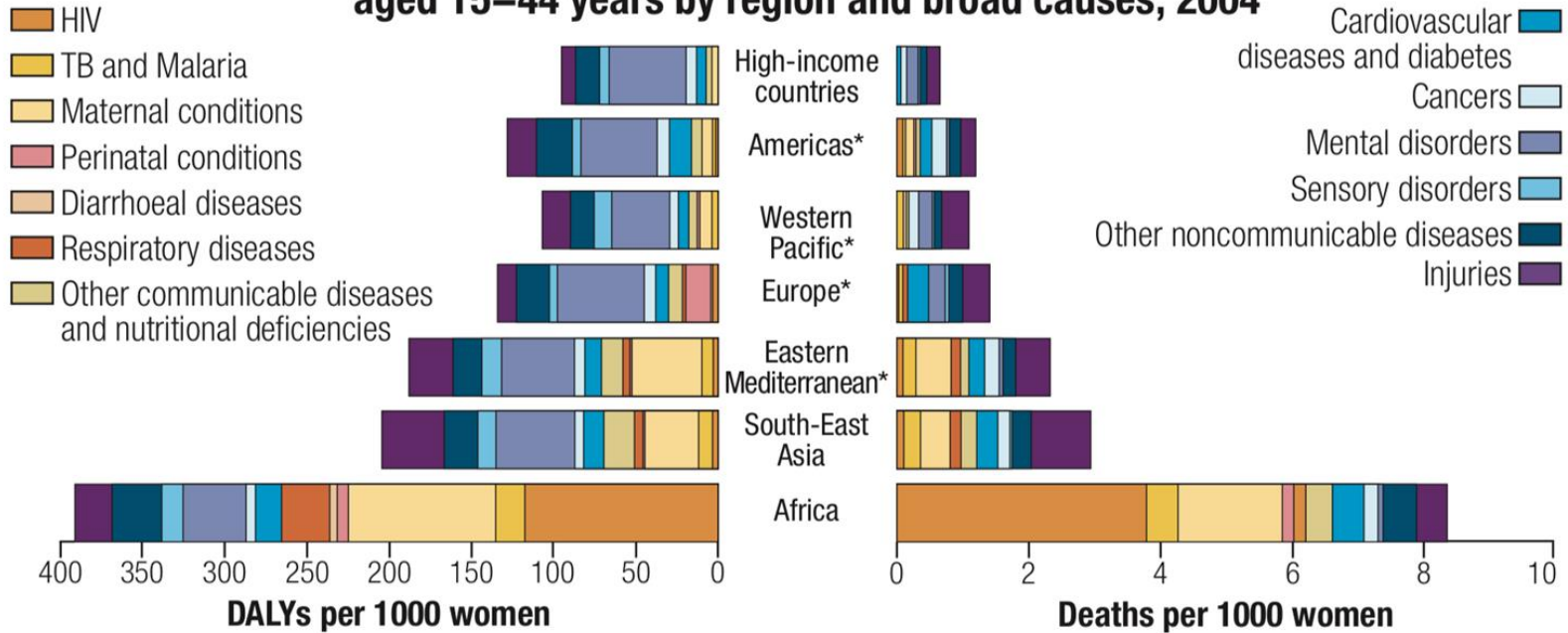
Fact 5

Maternal health mirrors the gap between the rich and the poor

Fact 6

Most maternal deaths can be prevented

Figure 1 **Mortality and disease burden (DALYs) in women aged 15–44 years by region and broad causes, 2004**

Legend:
- HIV
- TB and Malaria
- Maternal conditions
- Perinatal conditions
- Diarrhoeal diseases
- Respiratory diseases
- Other communicable diseases and nutritional deficiencies
- Cardiovascular diseases and diabetes
- Cancers
- Mental disorders
- Sensory disorders
- Other noncommunicable diseases
- Injuries

Regions: High-income countries, Americas*, Western Pacific*, Europe*, Eastern Mediterranean*, South-East Asia, Africa

DALYs per 1000 women (scale: 400, 350, 300, 250, 200, 150, 100, 50, 0)

Deaths per 1000 women (scale: 0, 2, 4, 6, 8, 10)

* High-income countries are excluded from the regional groups.
Source: World Health Organization.[1]

Facts:

Fact 7

Many women don't see a skilled health professional enough during pregnancy

Although a large proportion of women see skilled health personnel at least once during their pregnancy, only about half receive the recommended minimum of at least 4 visits during the pregnancy. Women who do not receive the necessary c**heck-ups** miss the opportunity to detect problems and receive appropriate care and treatment. This also includes **immunization** and **prevention** of mother-to-child transmission of HIV/AIDS.

Fact 8

About 22 million abortions continue to be performed unsafely each year

Over 5 million of these result in complications some of which may end in death. Almost every one of these deaths and complications could have been prevented through s**exuality education**, **contraceptive use**, and the provision of safe, legal induced abortion, and care for complications of unsafe abortions.

variables that reflect the state of health of persons in a community.

Health Systems Indicators

Health indicators could be used to:

- **Assess** the health care needs.
- **Compare** health status of different areas or groups of people over time, one country with other countries or worldwide.
- **Monitoring** and evaluation of health services, activities and programs- access, quality, effectiveness and equality.

Health Systems Indicators (Maternal)

Maternal health indicators:

- Maternal mortality ratio
- Skilled attendant at birth
- **Exclusive breastfeeding for six months (0–5 months)**
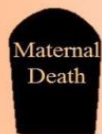- Under-five child mortality, with the proportion of newborn deaths
- Children under five who are stunted
- Proportion of demand for family planning satisfied
- Antenatal care coverage (at least four times during pregnancy)

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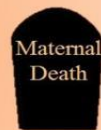
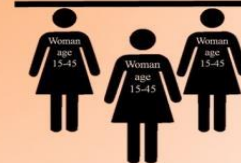Numerator: Maternal deaths

Denominator: Live births

Maternal Death

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

Maternal Death

Woman age 15-45

Population Research Institute: pop.org

Health Systems Indicators (Maternal)

Lifetime risk of maternal death:

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

$=$ Summation over all ages of (Age-specific chance of : 🤰 $\times$ Age-specific chance of : Maternal Death)
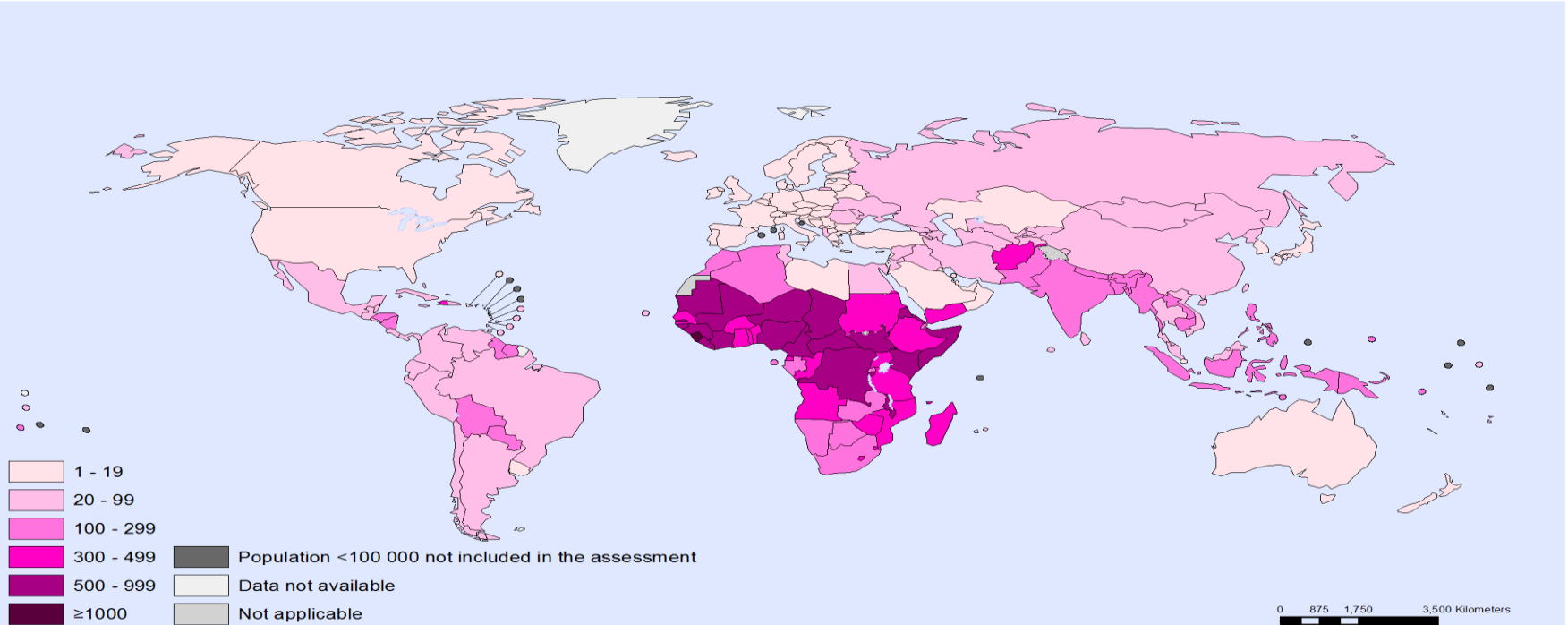
Population Research Institute: pop.org

Proportion Maternal Death:

Proportion of all female deaths due to maternal causes = (N of maternal deaths in a period/Number of all female deaths in same period) * 100

Health Systems Indicators (Maternal)

Maternal mortality ratio (per 100 000 live births), 2015

Legend:
- 1 - 19
- 20 - 99
- 100 - 299
- 300 - 499
- 500 - 999
- ≥1000
- Population <100 000 not included in the assessment
- Data not available
- Not applicable

0 875 1,750 3,500 Kilometers

Data Source: World Health Organization
Map Production: Health Statistics and
Information Systems (HSI)
World Health Organization

World Health Organization

SAUDI ARABIA

Year	Maternal mortality ratio (MMR)[a]	Maternal deaths	AIDS-related indirect maternal deaths	Live births[b]	Proportion of maternal deaths among deaths of female reproductive age (PM %)
	Per 100 000 live births (lb)	Numbers	Numbers	Thousands	
1990	46 [32-67]	270	0	579	5.6
1995	33 [23-46]	190	0	581	4.2
2000	23 [16-34]	130	0	566	2.9
2005	18 [12-27]	100	0	578	2.3
2010	14 [8-23]	84	0	613	1.9
2015	12 [7-20]	72	0	619	1.6

[a] MMR and PM are calculated for women 15-49 years.
[b] Live birth data are from World Population Prospects: the 2015 Revision. New York, Population Division, Department of Economic and Social Affairs, United Nations Secretariat; 2015.

Annual Rate of Reduction	(%)
1990-2015	5.5 [3.7 - 7.5]
1990-2000	6.8 [4.2 - 9.6]
2000-2015	4.7 [2.3 - 7.1]
2005-2015	4.2 [1.4 - 7.1]

MCH

Mortality in and around infancy
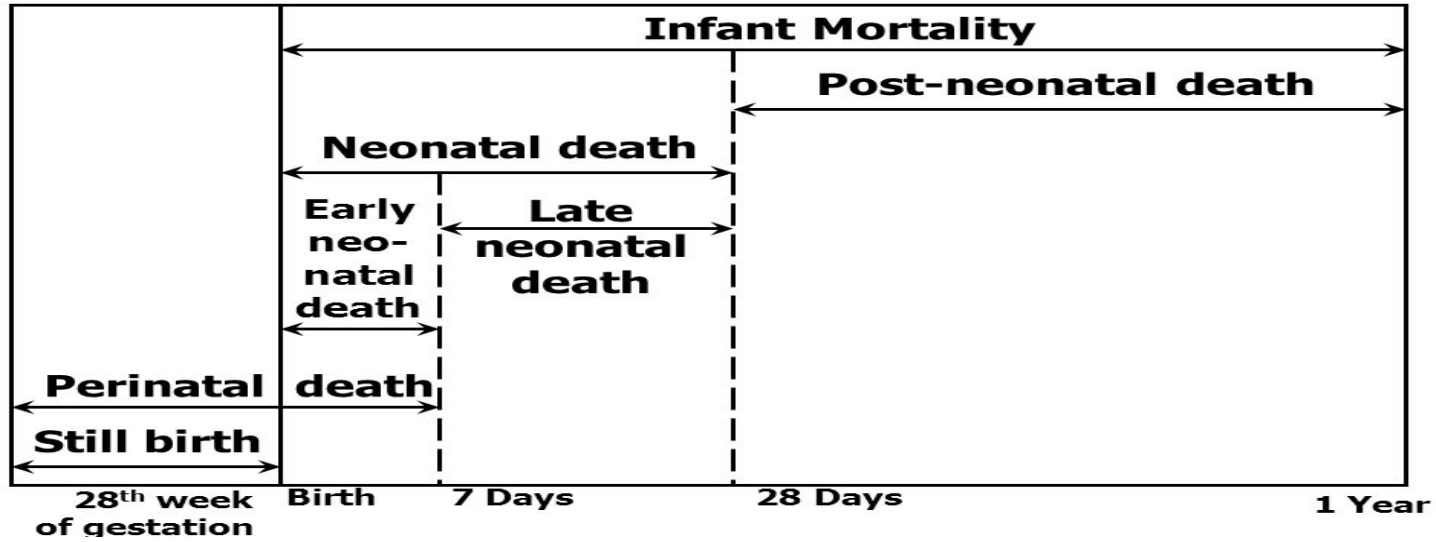
Health Systems Indicators (Infant)

Perinatal Mortality rate: Deaths between 28th week of gestation to less than 7 days of life expressed as per 1000 of total births (live and still) Reflects maternal health status, quality of maternal care and obstetric services

Neonatal Mortality rate: Deaths in the first 28 days of life expressed as per 1000 of total live births. Reflects primarily quality of obstetric care and neonatal care as well as maternal nutrition and health status

Post neonatal Mortality rate:
Deaths between 28 days of life to less than 1 year expressed as per 1000 of total live births.
Reflects infants' health care, nutrition and sanitation of the environment

Under-5 Mortality:

Deaths below 5 years expressed
as per 1000 of the number of children below the age of 5 years.

A. Maternal mortality ratio

B. Maternal mortality rate

C. Perinatal mortality rate

D. Neonatal mortality rate

E. Postnatal mortality rate

1. Deaths between 28 week of gestation to less than 7 days of life expressed as per 1000 of total births.

2. Deaths in the first 28 days of life expressed as per 1000 of total live births

3. Number of maternal deaths in a given period per population of women who are reproductive age

4. Deaths between 28 days of life to < 1 year expressed as per 1000 of total live births

5. Number of maternal deaths per live births

A. Maternal mortality ratio

B. Maternal mortality rate

C. Perinatal mortality rate

D. Neonatal mortality rate

E. Postnatal mortality rate

1. Deaths between 28 week of gestation to less than 7 days of life expressed as per 1000 of total births.

2. Deaths in the first 28 days of life expressed as per 1000 of total live births

3. Number of maternal deaths in a given period per population of women who are reproductive age

4. Deaths between 28 days of life to < 1 year expressed as per 1000 of total live births

5. Number of maternal deaths per live births

Trends in maternal mortality 1990 - 2015

Maternal mortality fell by almost half between 1990 and 2015

Maternal mortality ratio (maternal deaths per 100,000 live births in women aged 15 to 49), by region, 1990, 2010 and 2015

1990 2000 2015

Region	1990	2000	2015
Sub-Saharan Africa	987	846	546
South Asia	558	388	182
Middle East and North Africa	221	170	110
Latin America and Caribbean	135	99	68
East Asia and Pacific	165	118	62
CEE/CIS	69	56	25
Least developed countries	903	732	436
World	385	341	216
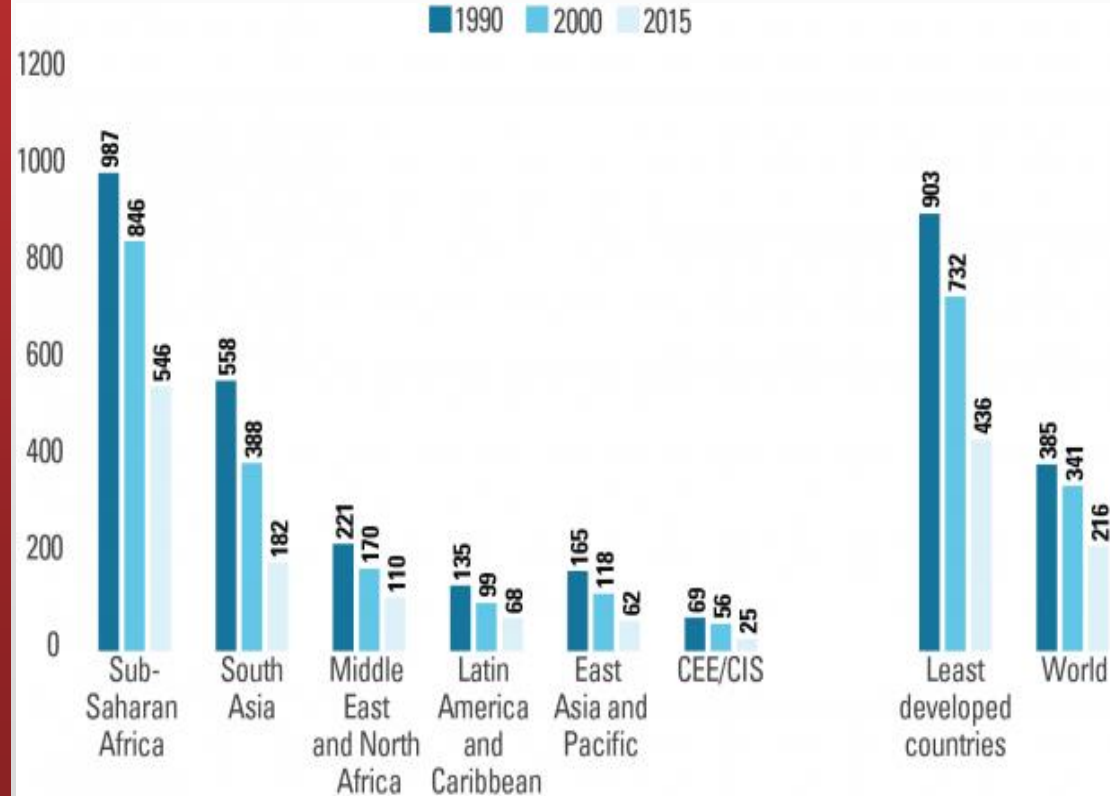
Health Systems Indicators (Infant)

Table.2 Saudi Arabia Infant Mortality Rate 1950-1010
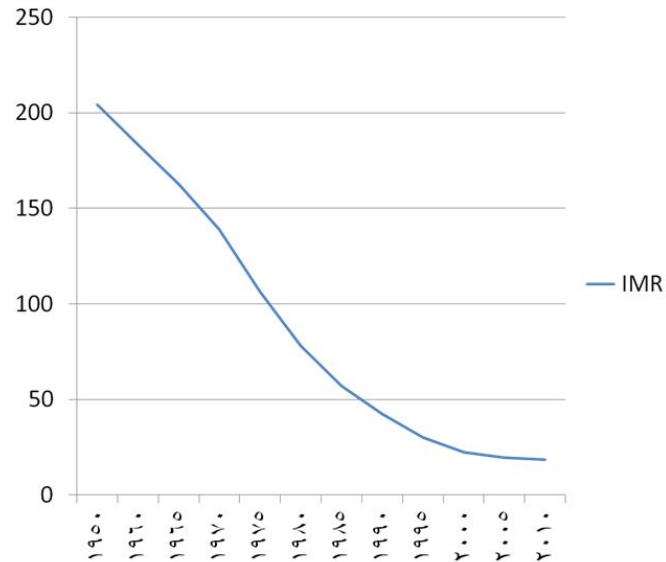
Period	IMR
1950	204.3
1960	183.1
1965	162.6
1970	139.2
1975	106.6
1980	78.2
1985	57
1990	42.3
1995	30.2
2000	22.2
2005	19.4
2010	18.5

Why has the maternal mortality declined?

1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES		**THE GLOBAL GOALS** For Sustainable Development		12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE AND JUSTICE STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS

Global response

- **Sustainable Development Goal 3**

    - **3.1** By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 live births.

Successful Interventions for Maternal Care

Antenatal care

- Nutrition support (anemia)
- Personal hygiene, dental care, rest and sleep
- Immunization (mother and the new born)
- Education on delivery and care of the new born
- Identifying high risk pregnancies
- Emphasizing on ANC visits and maintenance of AN card
- Importance and management of lactation
- Advise on birth spacing

Ref: WHO recommendations on maternal health, guidelines to improve maternal health. 2017.

Factors Affecting Pregnancy and Childbirth

Maternal health and fetal development	Pregnancy and childbirth
•Maternal nutrition •Smoking •Drinking •Diseases •Drugs •Maternal age •Prenatal care	•Preconception •health status •Age •Access to appropriate preconception •interconception health care • Poverty

Stages of maternal care

Preconception → Antenatal Care → Postpartum

1. Preconception:

Preconception health care :

Is the medical care of a woman or man receives from the doctor or other health professionals that aimed to increase the chance of having a healthy baby.

Preconception Care

What is involved in preconception counseling?

Questionnaire, Blood work, Urinalysis ..etc

A)Maternal behaviors like : Tobacco use , alcohol use , failure to consume adequate folic acid.

B)Other conditions like : unintended pregnancy , experiencing physical abuse , experiencing high levels of stress.

C)Certain maternal health conditions like : Diabetes , hypertension , obesity

2. Age:

- The chances of surviving the first year of life were better for infants born to mothers aged 20-34 years than for those born to mothers of other ages.

- The most favorable survival rates were among first births to mothers aged 20-24 and among first and second births to mothers aged 25-29.

Age under 20

- Women under the age of 20 have a significantly higher risk of serious medical complications related to pregnancy than those over 20. Teenage mothers are more likely to:

1. deliver prematurely

2. have a baby with low birth weight

3. experience pregnancy-induced hypertension

4. Nutritional deficiencies.

Age over 35

- The chances of conceiving begin to decline. An older woman who becomes pregnant is also less likely to have a problem-free pregnancy.

- Common issues include the following:

1. Underlying conditions(DM, HTN)

2. Chromosomal problems

3. Miscarriage

3. Antenatal Care:

Is the care you receive from healthcare professionals during your pregnancy.

1- folic acid and vitamin D supplements

2- nutrition, diet and food hygiene

3- lifestyle factors : smoking, recreational drug use and drinking alcohol

4- Antenatal screening tests

4. Interconception Health Care:

Interconceptional health care:

interconception health involves helping a woman **understand the importance of being healthy between pregnancies** and the need to wait at least 18 months before becoming pregnant again to help optimize birth outcome.

5. **Poverty**:

•The findings in analysis of NMIHS indicate that, for infants born to women living in poverty in the United States in 1988, overall excess mortality risk was approximately 60% compared with infants born to women living above the poverty level.

•hose living in poverty were more likely to smoke, to have poorer dietary habits, lower levels of education, and engage in higher risk and health-demoting practices.

2016 WHO ANC model

WHO FANC model	2016 WHO ANC model
First trimester	
Visit 1: 8–12 weeks	Contact 1: up to 12 weeks
Second trimester	
Visit 2: 24–26 weeks	Contact 2: 20 weeks Contact 3: 26 weeks
Third trimester	
Visit 3: 32 weeks Visit 4: 36–38 weeks	Contact 4: 30 weeks Contact 5: 34 weeks Contact 6: 36 weeks Contact 7: 38 weeks Contact 8: 40 weeks
Return for delivery at 41 weeks if not given birth.	

Risk Factor in maternal health

1. HTN
2. Heart Disease
3. GDM
4. Tobacco & alcohol use
5. STDs
6. Nutrition
7. Unhealthy weight
8. Genetic factor
9. Postpartum depression

Unhealthy weight

YOUR GUIDE TO
Pregnancy Weight Gain

Pre-pregancy weight	Recommended weight gain
Underweight (BMI < 18.5)	28 to 40 lbs. (about 13 to 18 kg)
Normal weight (BMI 18.5 to 24.9)	25 to 35 lbs. (about 11 to 16 kg)
Overweight (BMI 25 to 29.9)	15 to 25 lbs. (about 7 to 11 kg)
Obese (BMI 30 or more)	11 to 20 lbs. (about 5 to 9 kg)

Prenate
VITAMIN FAMILY

Murry MM. Pregnancy Weight Gain – Know the Factors. Mayo Clinic Website.
http://www.mayoclinic.org/healthy-lifestyle/pregnancy-week-by-week/expert-blog/pregnancy-weight-gain/bgp-20055798. Reviewed July 8, 2011. Accessed December 8, 2015.

Is It Important to Gain the Recommended Amount of Weight During Pregnancy?

◦ Gaining less   Small baby.

◦ Gaining more   large baby.

Inadequate nutrition

- Inadequate or deficient in nutrition for **mother** such as :

Iron → morbidity and mortality, Preterm birth and Neurological dysfunction.

Vit A → Night-blindness.

- Inadequate or deficient in nutrition for **neonate** such as :

Folate → deficits in the development of the neural tube.

Calcium → restricts fetal skeletal development.

Iron → intrauterine growth retardation and low birth weight.

Tobacco use

Dangers of SMOKING During Pregnancy

- Smoking effects :
harder for a woman to get pregnant.
Premature birth
certain birth defects(Cleft lip or cleft palate)
Risk of miscarriage(placenta can separate).
Sudden Infant Death Syndrome (SIDS).

- Second hand smoke effects:
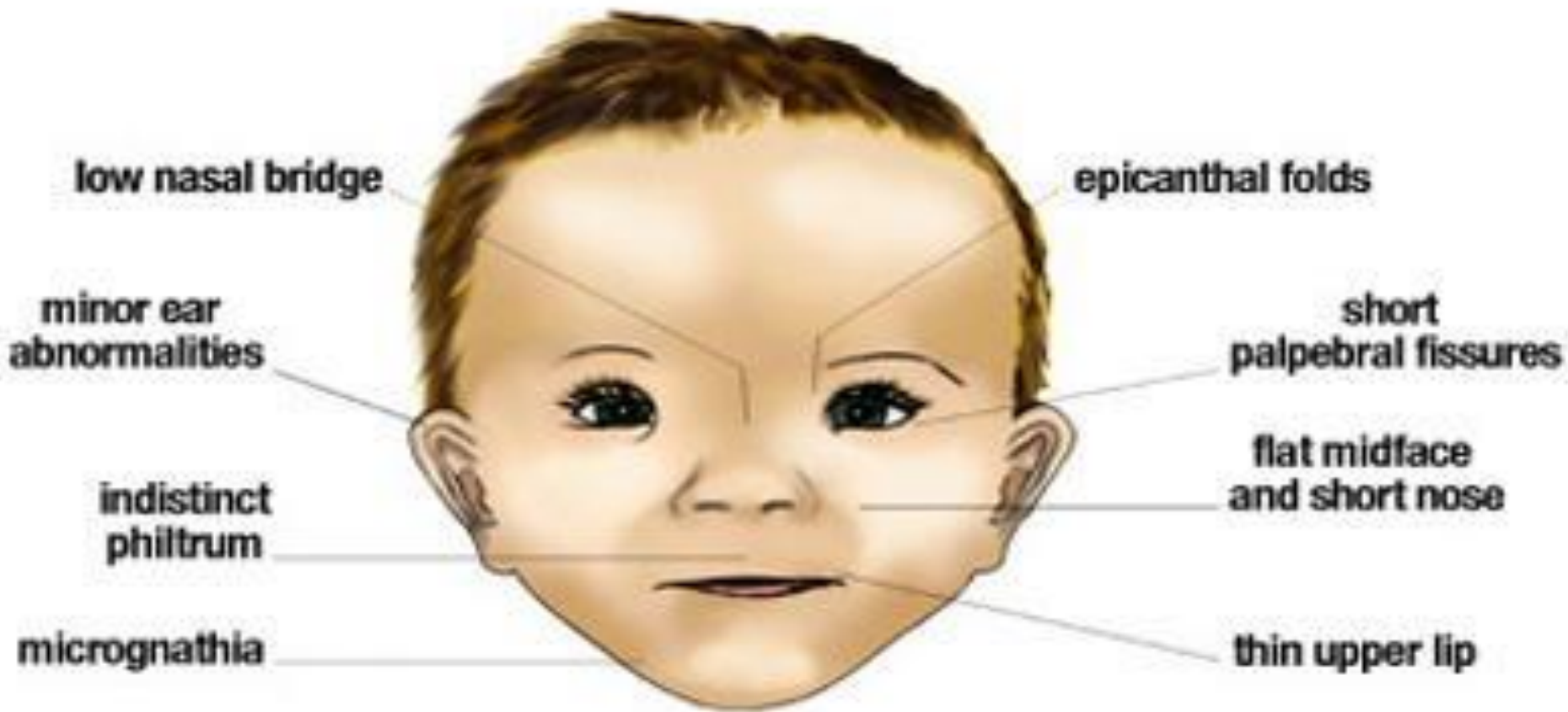Low birth weight, asthmatic attack and SIDS.

Alcohol

•There is No known safe amount of alcohol use during pregnancy and Alcohol in the mother's blood passes to the baby through the umbilical cord.

•Fetal alcohol spectrum disorders (FASDs):lifelong physical, behavioral, and
intellectual disabilities.

Complication of drinking alcohol:
Miscarriage, stillbirth.

FETAL ALCOHOL SYNDROME

low nasal bridge

epicanthal folds

minor ear abnormalities

short palpebral fissures

indistinct philtrum

flat midface and short nose

micrognathia

thin upper lip

Genetic conditions

- more than 50 percent of miscarriages in the early stages of pregnancy are due to abnormalities of the chromosomes.

- Examples:
Cystic fibrosis
Marfan syndrome
PCKD
Neurofibromatosis.

Summary

Preconception and early pregnancy counselling	Smoking, alcohol, illisting drug, diet, supplementation (folate, vit D, Iron), chronic diseases, screening, Review medications, problem in previous pregnancy, vaccinations.
Antenatal care	Pregnancy test, visits(16, 28, 34, 36, 38), if nulliparous (+ 25, 31),

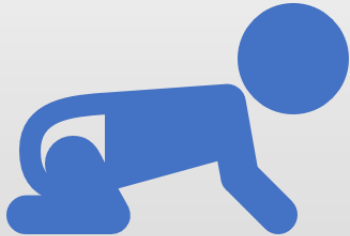# Social and Physical Determinants of Maternal Health

Social and Physical Determinants of maternal Child Health

A range of biological, social, environmental, and physical factors have been linked to maternal, infant, and child health outcomes.

Child development
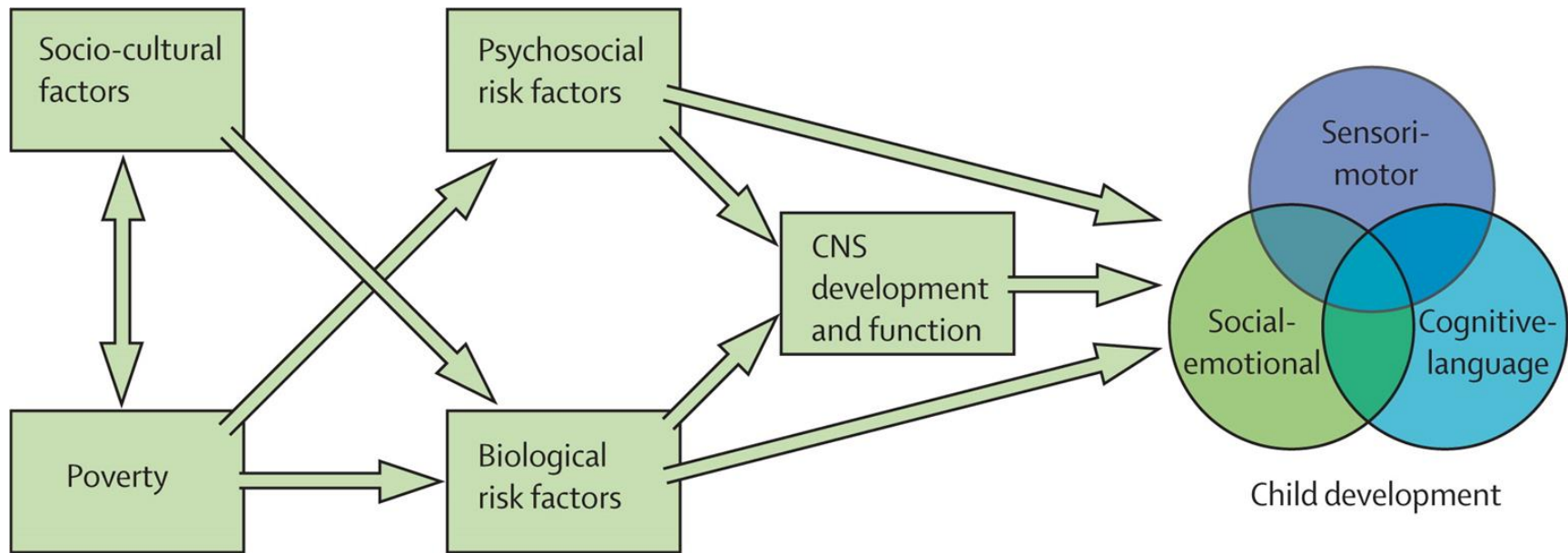
1- Biological Determinants:

- Birth weight

- Age of The Mother

- Repeated pregnancies (why?)

- Birth Spacing: < 1 year = 2-4 times risk of mortality.

- Multiple Births

2- Social Determinants:

INCOME

EDUCATION

NUTRITION

VIOLENCE

HEALTH CARE QUALITY (DEVELOPING COUNTRIES)

ENVIRONMENTAL CONDITIONS

CULTURE

How to improve the health and well-being of women, infants, children, and families

- approximately 830 women die every day from causes related to pregnancy and childbirth.

- **5.9 million** children under age five died in 2015, 16000 every day.

- With quality health care, many of these deaths could be prevented.

WHAT ARE PREGNANT WOMEN **DYING** FROM?

28%

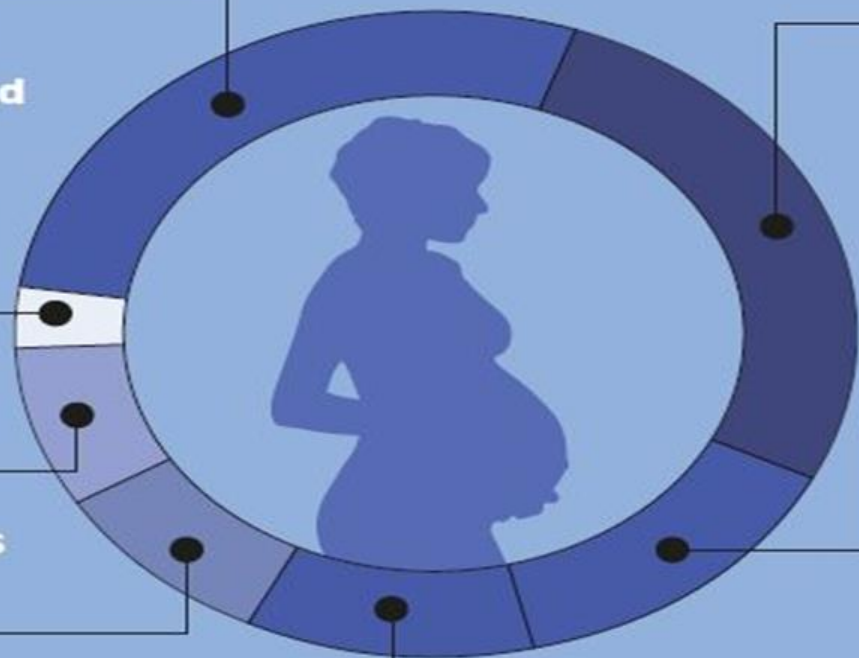Pre-existing medical conditions exacerbated by pregnancy (such as diabetes, malaria, HIV, obesity)

3%

Blood clots

8%

Abortion complications

9%

Obstructed labour and other direct causes

27%

Severe bleeding

14%

Pregnancy-induced high blood pressure

11%

Infections (mostly after childbirth)

❖ How to improve Maternal health?

- First 24 hours : assessment of **vaginal bleeding**, **uterine contraction**, **temperature** and **heart rate** should be done routinely during the **first 24 hours.**

- Breastfeeding should be assessed.

- women should be asked about their emotional wellbeing.

- After **10–14 days**, all women should be asked about postpartum depression.

❖ How to improve Maternal health?

•All women should be asked about sexual intercourse and possible dyspareunia as part of an assessment of overall well-being **2–6 weeks after birth.**

•Iron and folic acid supplementation should be provided for at least 3 months after delivery.

How to improve maternal health?

Vaccination:

Before pregnancy: measles, rubella

During pregnancy: vaccine to protect against whooping cough .

Thank you