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Obstetrics & Gynaecology - Topic 1 - Demographic and Vital Statistics

Understanding Maternal and Perinatal Health

What Vital Statistics Tell Us

- Vital statistics describe important events such as births and deaths in a defined population and period.
- They help a maternity service identify preventable harm, plan resources and check whether care is improving.
- A number becomes meaningful only when its numerator, denominator, time period and population are clearly stated.
- A referral hospital may receive many critically ill patients, so its results cannot be compared fairly with a low-risk unit using crude figures alone.

Live Birth

- A live birth shows a sign of life after complete expulsion or extraction, such as breathing, a heartbeat, cord pulsation or definite voluntary movement.
- Gestational age and birth weight do not remove the need to record a baby who shows signs of life as live-born.
- A baby who is born alive and dies before 28 completed days of life must be recorded as a live birth followed by a neonatal death.

Birth and Fertility Rates

A. Crude Birth Rate

- The crude birth rate is the number of live births during a year divided by the mid-year population, multiplied by 1,000.
- For example, 2,400 live births in a population of 120,000 give a crude birth rate of 20 per 1,000 population.
- This measure reflects the whole population, including people outside reproductive age, so age structure affects the result.

B. General Fertility Rate

- The general fertility rate instead relates live births to women in the defined reproductive-age group.
- For the usual reproductive-age band, the general fertility rate is annual live births divided by women aged 15–49 years, multiplied by 1,000.

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Maternal Mortality Measures

A. Maternal Mortality Ratio

- The **maternal mortality ratio** uses live births as its denominator and approximates the risk associated with pregnancy.

B. Maternal Mortality Rate

- The maternal mortality rate instead uses women of reproductive age as the denominator and is influenced by both obstetric risk and fertility.

Selecting the Correct Denominator

One woman and two live-born babies



One woman delivering live-born twins contributes one woman and two live-born babies to the relevant denominators

- Use the same geographical area and reporting period for the numerator and denominator.
- Count babies for perinatal statistics and women for maternal outcomes, because a multiple pregnancy can contribute more than one baby.
- Always state the fetal gestational-age or weight threshold when reporting stillbirths or perinatal mortality.

Indicator	Calculation
Crude birth rate	Live births ÷ mid-year population × 1,000.
Maternal mortality ratio	Maternal deaths ÷ live births × 100,000.
Stillbirth rate	Qualifying stillbirths ÷ total births × 1,000.
Perinatal mortality rate	Qualifying stillbirths plus early neonatal deaths ÷ total births × 1,000.

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Indicator	Calculation
Neonatal mortality rate	Deaths before 28 completed days ÷ live births × 1,000.

Maternal Mortality and Severe Morbidity

Maternal Death

- A maternal death occurs during pregnancy or within 42 days after its end from a cause related to, or worsened by, pregnancy or its management.
- Accidental or incidental causes are excluded from the usual maternal-death definition.
- The definition applies regardless of pregnancy duration or whether the pregnancy is inside the uterus.

Classification by Relationship to Pregnancy

A. Direct Maternal Death

- A direct death results from an obstetric complication or from its treatment, omission or incorrect treatment.
- Examples include fatal postpartum haemorrhage, eclampsia, obstetric sepsis and complications of an unsafe abortion.

B. Indirect Maternal Death

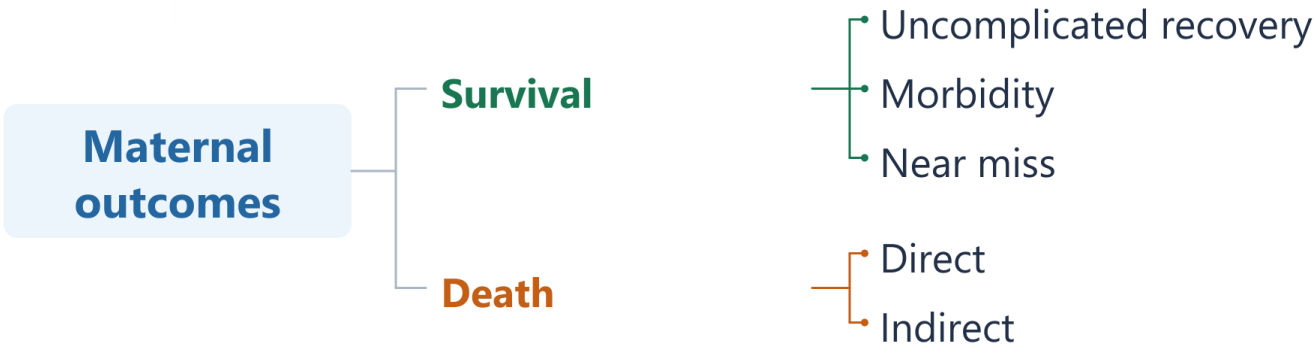
- An indirect death results from an existing or newly developed disease that pregnancy aggravates.
- Examples include severe cardiac disease or anaemia that becomes more dangerous because of pregnancy-related physiological demands.

Related Definitions

- A pregnancy-related death includes any death during pregnancy or within 42 days after it ends, regardless of cause.
- A late maternal death occurs from a direct or indirect obstetric cause more than 42 days but less than one year after pregnancy ends.
- These categories must not be silently combined when calculating a conventional maternal mortality ratio.

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Maternal Morbidity and Near Miss



- Maternal morbidity includes physical or psychological illness that complicates pregnancy, childbirth or the postnatal period.
- Examples include anaemia, infection, fistula, thromboembolism, incontinence and mental-health problems.
- A maternal near miss describes a woman who almost died from a pregnancy-related complication but survived during pregnancy, childbirth or within 42 days after pregnancy ended.
- Near-miss assessment focuses on life-threatening organ dysfunction, rather than simply counting every hospital admission.

Recognising Severe Organ Dysfunction

- Shock, severe hypoxaemia, prolonged loss of consciousness, major coagulation failure or severe renal dysfunction suggest critical illness.
- Management indicators, such as ventilation or emergency hysterectomy for haemorrhage, can help identify cases for review.
- Use the complete agreed criteria consistently, because local resources influence which investigations and interventions are available.

Organ Systems Used in Near-Miss Assessment

System	Examples of life-threatening dysfunction
Cardiovascular	Shock, cardiac arrest or continuous vasoactive treatment.
Respiratory	Severe hypoxaemia, gasping or ventilation unrelated to anaesthesia.
Renal	Persistent severe oliguria, severe creatinine elevation or dialysis.
Coagulation	Failure to form clots, profound thrombocytopenia or massive transfusion.
Hepatic	Severe jaundice in association with pre-eclampsia.

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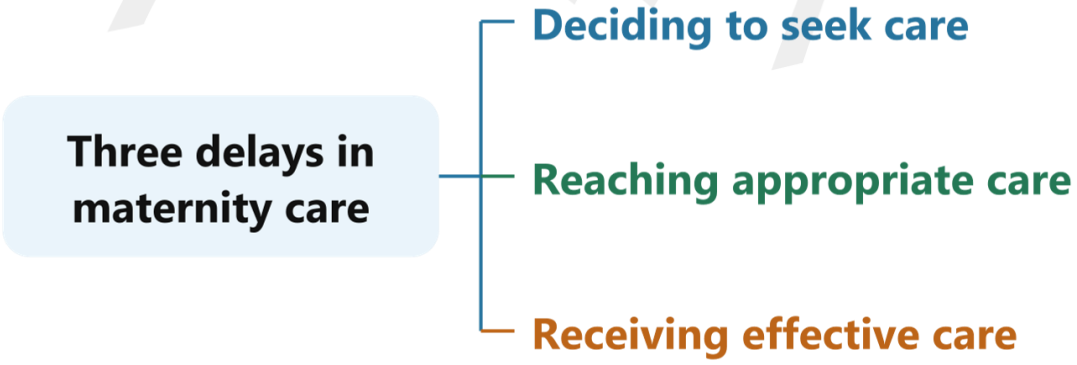
System	Examples of life-threatening dysfunction
Neurological	Prolonged unconsciousness, stroke or uncontrollable seizures.
Uterine	Hysterectomy required because of haemorrhage or infection.

- These examples explain the organ-based approach; apply the complete adopted clinical, laboratory and management criteria when formally classifying a case.
- A facility with limited access to dialysis or laboratory testing may under-record some criteria, so comparisons must consider available resources.

Useful Measures

- The maternal near-miss ratio expresses near-miss cases per 1,000 live births.
- The severe maternal outcome ratio includes maternal deaths and near misses per 1,000 live births.
- The mortality index is maternal deaths divided by maternal deaths plus near misses, multiplied by 100.
  - If four women die and 36 survive a near miss, the mortality index is 10%.
- Interpret these measures with case severity, referral patterns and data quality rather than treating one value as a complete judgment of care.

Understanding the Three Delays



1. Delay in Deciding to Seek Care

- Poor recognition of danger signs, financial dependence, fear and lack of family support may delay a decision to seek help.
- A birth-preparedness plan should explain warning signs, where to go and who can help the woman reach care.

2. Delay in Reaching an Appropriate Facility

- Distance, lack of transport, cost and repeated referrals may prevent timely access to emergency obstetric services.
- The referring team should stabilise the patient, contact the receiving unit and arrange suitable transport and an escort.

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