Role of the Anaesthetist in Prevention of Maternal Deaths

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Presentation Outline

Definitions and Explanatory Notes

Current maternal mortality Statistics

Outline of causes of maternal mortality

Anaesthesia as an indirect cause of maternal mortality

Review methods for preventing maternal deaths

Role of the Anaesthetist in preventing maternal deaths

Conclusions and Recommendations

Definition

What is Maternal Mortality?

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Maternal death is the death of a woman while pregnant or within 42 days of termination of a pregnancy, irrespective of the duration and site of the pregnancy from any cause related to or aggravated by the pregnancy or its management

-*World Health Organization, WHO*

The WHO also defines a *pregnancy-related death* as the death of a woman while pregnant or within 42 days of termination of a pregnancy, irrespective of the cause of death

Introduction and background

The Millennium Development Goal 5: Improve maternal health

- The target of the Millennium development goal 5 is to reduce by three quarters, between 1990 and 2015, the maternal mortality ratio.
- Despite progress, pregnancy remains a major health risk for women in several regions.
- Despite proven interventions that could prevent disability or death during pregnancy and childbirth, maternal mortality remains a major burden in many developing countries.
- In the developing regions as a whole, the maternal mortality ratio dropped by 34 per cent between 1990 and 2008, from 440 maternal deaths per 100,000 live births to 290 maternal deaths. However, the MDG target is still far off.

Source: United Nations. The millennium development goals report 2011. New York: United Nations; 2011

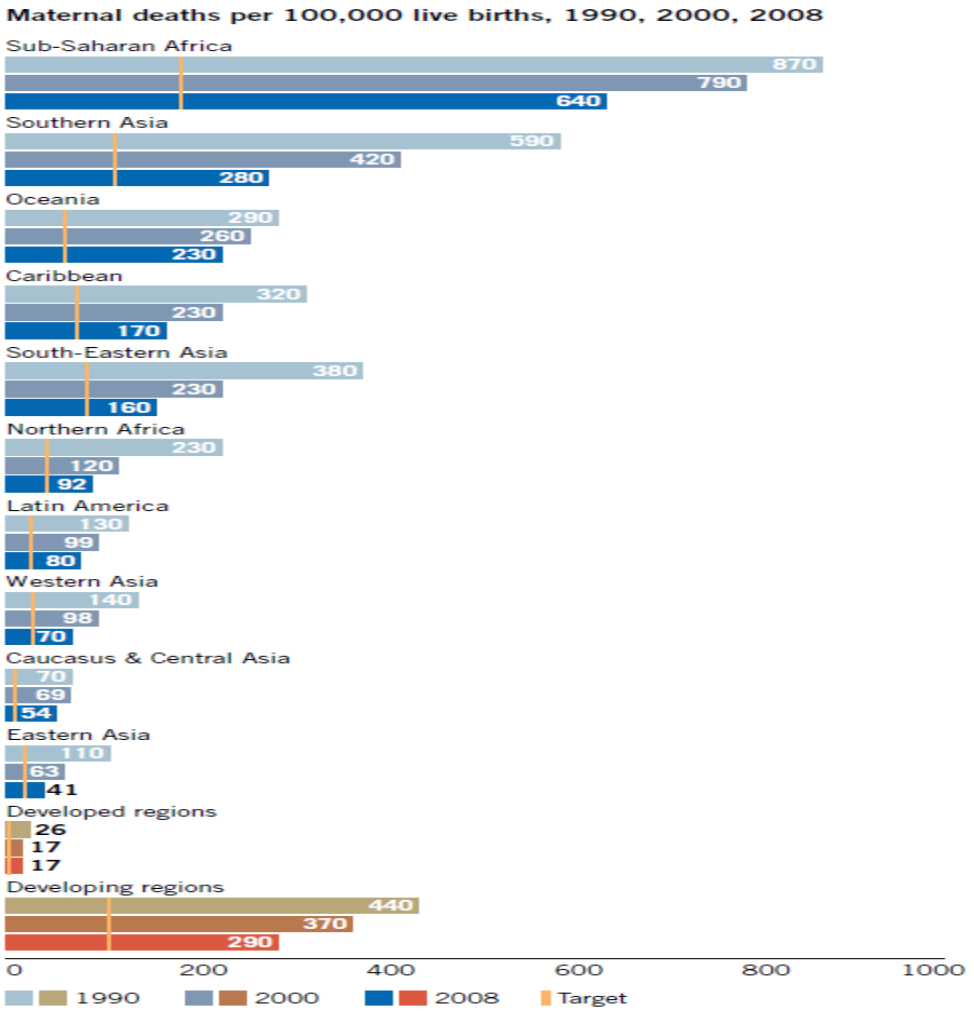
Introduction and background

Global burden of maternal deaths

- Every year, 358,000 women die due to complications of pregnancy and childbirth.
- There are about 1,000 preventable maternal deaths everyday.
- Women in Sub-Saharan Africa experience a 1 in 31 chance of dying compared to developed regions where the rate is 1 in 4300.
- 35% of maternal deaths are as a result of haemorrhage.

Source: World Health Organization. Essential interventions, commodities and guidelines for reproductive, maternal, new-born and child health. PMNCH, WHO and Aga Khan University; 2011

Introduction and background



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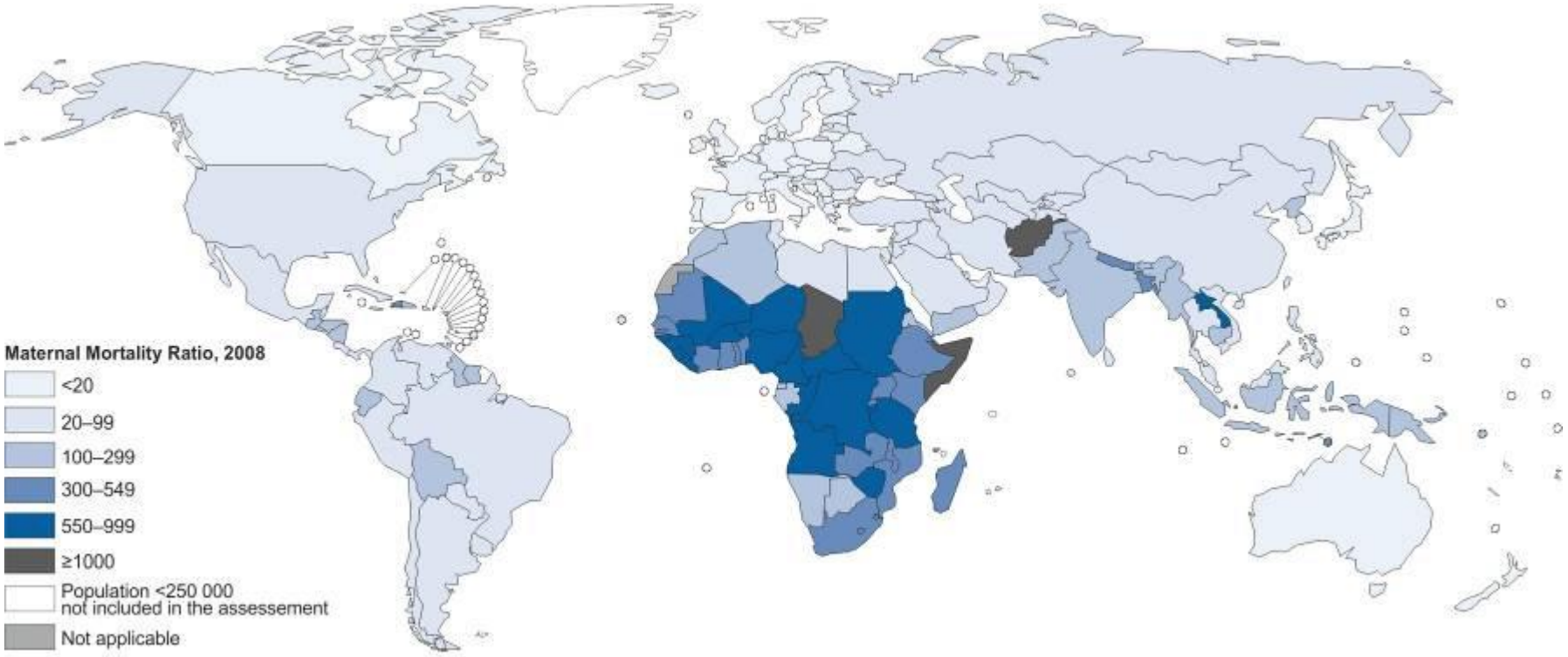

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Trends in maternal mortality in Nigeria

- Despite a 41% decrease in MMR between 1990 and 2010, Nigeria was rated as the second worst country to give birth in 2012

- It is now estimated that 40,000 Nigerian women die each year from childbirth. This accounts for 14 percent of the 287,000 global estimates maternal deaths

- In 2000, Nigeria accounted for only 10percent of global maternal deaths, but we now account for 14 percent, when Nigeria is only 2% of the world population.

- Progress is being made, but more rapid progress needs to be made if Nigeria is to meet the MDG target in 2015

How does Nigeria compare with the rest of the world in MMR?

- India is Number 1 country with 56,000 maternal deaths, while Nigeria is number 2, with 40,000 maternal deaths

- India accounts for 19% of global estimates of maternal deaths, while Nigeria accounts for 14%. Together, these two countries account for one-third of total number of maternal deaths worldwide
- Nigeria is one of 10 countries with high MMRs (>300/100,000). Other countries are: Chad, Somalia, Sierra Leone, CAR, Burundi, Guinea-Bissau, Liberia, the Sudan, Cameroon and Nigeria

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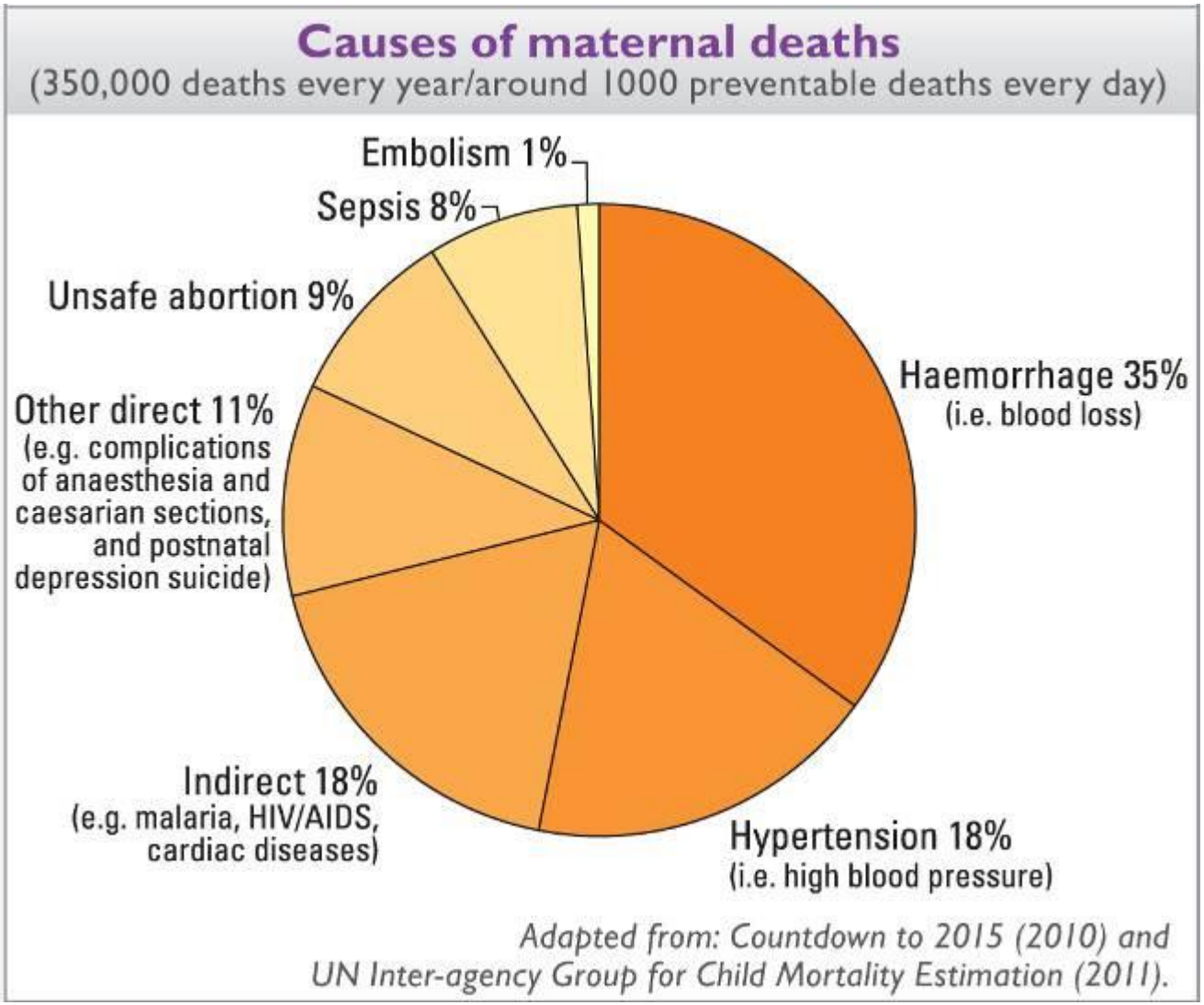

Source: World Health Organization. Essential interventions, commodities and guidelines for reproductive, maternal, new-born and child health. PMNCH, WHO and Aga Khan University; 2011

Source: B J Anaesth 2008; 100(1): 17-22

Direct deaths due to anaesthesia in the UK, 1985-2005 – Confidential Reports into Maternal Deaths

	Number	% of maternal deaths	Rate per/100,000 Maternities
1985-87	6	4.3	0.26
1988-90	4	2.8	0.17
1991-93	8	6.3	0.35
1994-96	1	0.7	0.05
1997-99	3	2.8	0.14
2000-02	6	5.7	0.30
2003-05	6	4.5	0.28

Anaesthesia as a cause of maternal deaths in Nigeria

Reference	Year	Location	MMR/ 100,000	Anaesth Deaths
Enohumah & Imarengiay	2006	UBTH, Benin	678	6
Ujah et al,	2005	JUTH, Jos	740	39
Okafor & Ezegwui,	2009	UNTH, Enugu	-	9
Olopade & Lawoyin	2010	Adeoyo, Ibadan	963	<4
Agan et al,	2010	UCTH, Calabar	1,513	-
Om'Aghoja, et al	2010	UBTH, Benin	2,282	3
Ngwan et al,	2010	JUTH, Jos	1,260	2

Anaesthetic causes of maternal deaths

Post-operative respiratory failure

Drug Administrative Errors

Anatomical compromise

Post-operative Respiratory Failure

- Lack of experience in laryngoscopy, intubation and other advanced airway techniques
- Unrecognized oesophageal intubation
- Asthmatics undergoing anaesthesia for cesearean section
- Gastric contents aspiration – “Mendelson syndrome”

Mendelson Syndrome

- First recognized as a cause of anaesthetic-related deaths in 1848 by James Simpson
- Was later described in 1946 by Mendelson as the pulmonary sequelae of aspiration of gastric contents most frequent in obstetrics patients
- Now rare – but still occurs in 1 in 3000-6000 anaesthetics.
- Results in severe pulmonary tissue damage, and oedema with clinical tachypnoea, bronchospasm, wheeze and respiratory insufficiency
- Has high case-fatality rates, even in the best of settings

Prevention of Mendelson Syndrome

- Pre-operative fasting
- Reducing gastric acidity – e.g. oral sodium citrate or H_2 receptor antagonists (ranitidine, metoclopramide)
- Rapid sequence induction (RSI)
- Cricoid pressure
- Nasogastric tube placement
- Airway devices
- Preference for regional anaesthesia

Management of Mendelson Syndrome

- Head down tilt
- Oropharyngeal suction
- 100% oxygen
- Apply cricoid pressure and deepen anaesthesia/perform RSI
- Intubate trachea and release cricoid once airway is secured
- Tracheal suction and consider bronchoscopy
- Bronchodilators may be necessary

Maternal deaths in which Anaesthesia contributed

- Failure to recognise serious illnesses
- Poor management of haemorrhage, anaemia, sepsis, and pre-eclampsia/eclampsia
- Management of obese patients
- Delayed anaesthetic response to emergencies
- Lack of feedback maternal mortality audit

Failure to recognise serious illnesses

- Inadequate pre-operative assessment e.g. failure to recognise pre-existing DM, severe anaemia or hypertension
- Inadequate assessment of severity of pre-existing medical condition
- Lack of experiences/expertise in dealing with anaesthesia in patients with rare diseases

Anaesthetic deaths from haemorrhage

- Poor recognition of concealed haemorrhage
- Ignoring signs of shock
- Not believing low blood pressure readings
- The wrong administration of large volumes of cold fluids
- Poor postoperative care where continuing haemorrhage may go un-noticed
- Not recognising that women who decline blood transfusion require consultant anaesthetic care

Prevention of anaesthetic deaths from haemorrhage

- Any potentially bleeding case should be handled by a consultant anaesthetist
- Re-adjustment of BP parameters in women with pre-existing hypertension
- Warming high volume infusions
- Close monitoring in theatre until woman's condition is stable
- Invasive monitoring techniques may be useful
- Balloon tamponade has become increasingly useful

Anesthetic complications due to sepsis

- Severe sepsis can lead to cardiovascular collapse
- CVS collapse is more likely in women undergoing spinal or epidural anesthesia
- Circulatory support requires careful fluid monitoring in a critical care unit or operating theatre environment

Obesity as risk factor for anaesthetic complications

- Severe obesity increases anaesthetic risks several folds
- Anaesthetic units need to develop protocols for the management of obese women
- This should include the use of pre-assessment procedures, special monitoring equipment, and special surveillance techniques
- Use of prophylactic low molecular weight heparin or thrombo-embolic stockings may reduce the likelihood of deep vein thrombosis.

Role of Anaesthetist in preventing maternal deaths

- An obstetric anaesthetist need to be knowledgeable on new methods for preventing maternal deaths.
- Attend MDR and CEMD Sessions that review causes and defects in management that lead to maternal deaths
- Update skills in obstetrics anaesthesia – especially regional anaesthesia

New evidence-based techniques for preventing maternal deaths

- New uterotonics for the prevention and treatment of PPH, e.g. Misoprostol
- Balloon tamponade for the treatment of shock
- Magnesium sulphate for the prevention and treatment of eclampsia
- New antibiotics for the prevention and treatment of infections

Maternal death and near miss audits are crucial!

- Anaesthetics should attend maternal death and near miss audits with obstetrician colleagues.
- A lot can be learnt from these sessions that will impact future service delivery and the prevention of anaesthetic deaths
- As these should be based on “no blame inquiry”, colleagues are enjoined to keep an open mind at these sessions, and be ready to take criticisms in good faith

Clinical skills building in obstetric anaesthesia

- Anaesthetists should endeavour to update themselves on skills for obstetric anaesthesia
- There should be greater use of regional (spinal and epidural) anaesthesia rather than inhalational anaesthesia
- Protocols that engender prompt response of anaesthetists to obstetric emergencies should be developed in maternity units
- Anaesthetists should buy into programs designed to prevent maternal deaths in maternity units

Conclusion

- The high rate of maternal mortality is currently a major public health concern in Nigeria
- The prevention of maternal deaths should be seen as a collaborative effort among all health professionals providing care to women
- Anaesthetics must see themselves as key partners and be prepared to play leading roles in reducing maternal mortality and achieving MDG5.

Thank you