Systematic review on the incidence/prevalence of severe maternal morbidity

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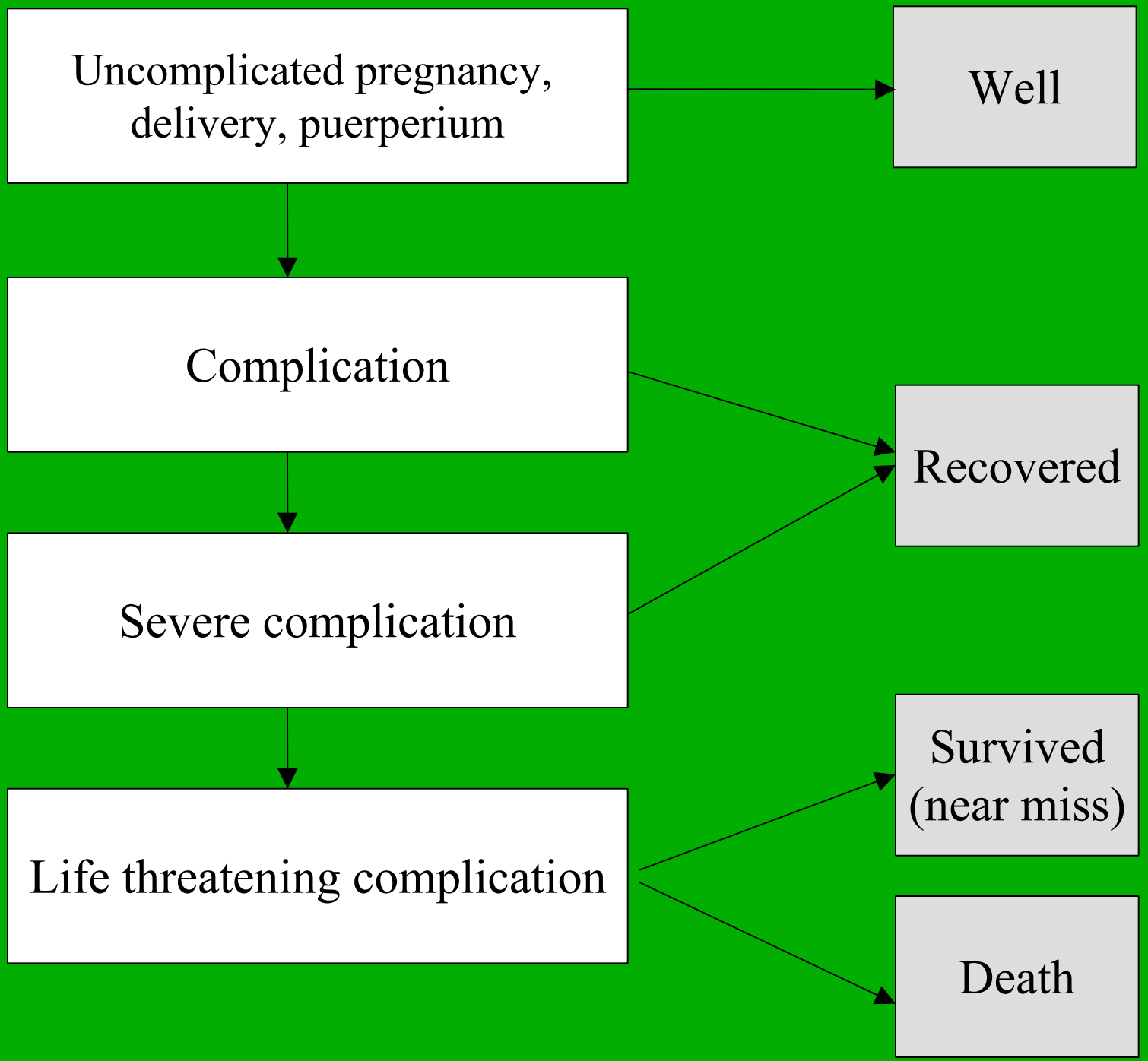
WHO

Maternal mortality is frequently described as "just the tip of the iceberg", implying that there is a vast base to the iceberg – maternal morbidity – which remains largely undescribed.

What do we know about maternal morbidity?

Why is it important to know?

Let's look for the answers.


Uncomplicated pregnancy, delivery, puerperium
Well
Complication
Recovered
Severe complication
Survived (near miss)
Life threatening complication
Death

What is severe maternal morbidity (SMM)?

- Near-miss?
- Severe obstetric morbidity?
- Life-threatening complication?
- Acute severe maternal morbidity?

Number of terms are in use to describe incidents and definition

Identification of these cases are the most difficult issue

What is SMM?

A near-miss describes a patient with an acute organ system dysfunction, which, if not treated appropriately, could result in death.

Mantel GD et al.
Severe acute maternal morbidity:
a pilot study of a definition for a near-miss.
British J of Obstet and Gynecol, 1998;105:985-990.

What is SMM?

Severe complications from 28th week of gestation to 42nd day post partum that would have resulted in death of the mother or a definite invalidating sequelae without medical intervention

.*Prual A et al.,*
Severe maternal morbidity from direct obstetric causes in West Africa: incidence and case fatality rates.
Bull of the WHO, 2000;78:593-602.

What is severe maternal morbidity?

Near-miss maternal mortality: all women admitted for ICU in pregnancy or up to 42 days post partum.

Murphy DJ et al.
Cohort study of near-miss maternal mortality and subsequent reproductive outcome.
Europ J Obstet&Gynec and Reprod Biol 2002;102:173-178.

Why is it important to know?

- Cases of severe morbidity occur in larger numbers than deaths allowing more robust conclusions on risk factors and substandard care
- Lessons to be learned from the management of cases who survived may be as useful as from those who died
- These lessons may be less threatening to health providers than deaths

Why is it important to know?

- If the requirement for total confidentiality is modified it may be possible to interview survivors
- Can be a potentially useful starting point for audits
- In developing countries these studies can be outcome measures for the evaluation of safe motherhood programmes at population level or just as case reviews

Objectives

- To summarise the prevalence /incidence of serious morbidity from studies
- To compare study designs and definitions

Search strategy

- *Computerised search of medical databases, including Medline, Popline, Scielo from 1998 to 2003; with the key words: "severe maternal morbidity" or "near-miss and maternal", limited to "human", "female and adults".*
- *The reference lists of identified articles were searched*
- *Hand search to identify articles in Lancet, European Journal of Obstetrics and Gynaecology, British Medical Journal, JAMA was made.*

Search strategy

- *WHO systematic review of maternal morbidity and mortality database was scanned for studies dated from 1998 .*
- *Experts were contacted for full text articles*
- *The title and abstract of the studies identified in the computerised search were scanned to exclude studies that were not obviously relevant*
- *The full texts of remaining studies were retrieved and scanned*

Quality of studies was assessed by the following criteria:

- *description of study period*
- *information about population characteristics*
- *information about place of delivery*
- *description of the study settings*
- *information about eligible and lost subjects, characteristics of them*
- *definitions of used conditions (morbidity or mortality)*
- *quality of forms of reporting data*
- *information about using special efforts to capture all maternal deaths*

Data extraction

- *The incidence/prevalence data on severe maternal diseases and complications were extracted*
- *Data on numbers and causes of maternal deaths were also collected*
- *The case-fatality ratio was calculated*

Results

58 studies identified

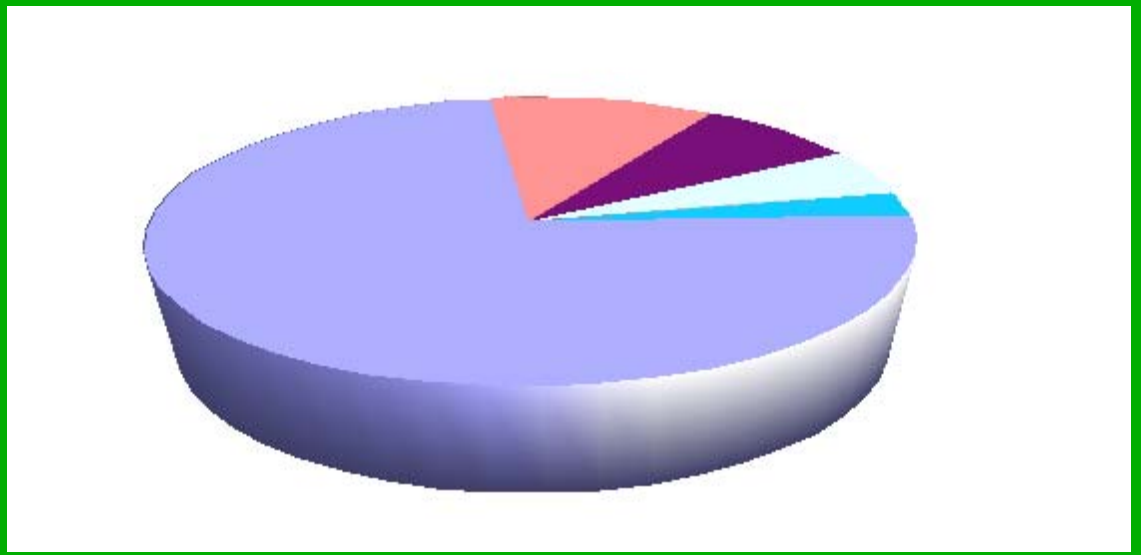
20 excluded

38 included

- *12 did not have data*
- *6 randomised placebo-controlled trials*
- *2 case-control design*

Design of the 38 included studies

- case-control population-based
- cohort population-based
- national data
- prevalence/-incidence survey
- hospital-based cross- sectional



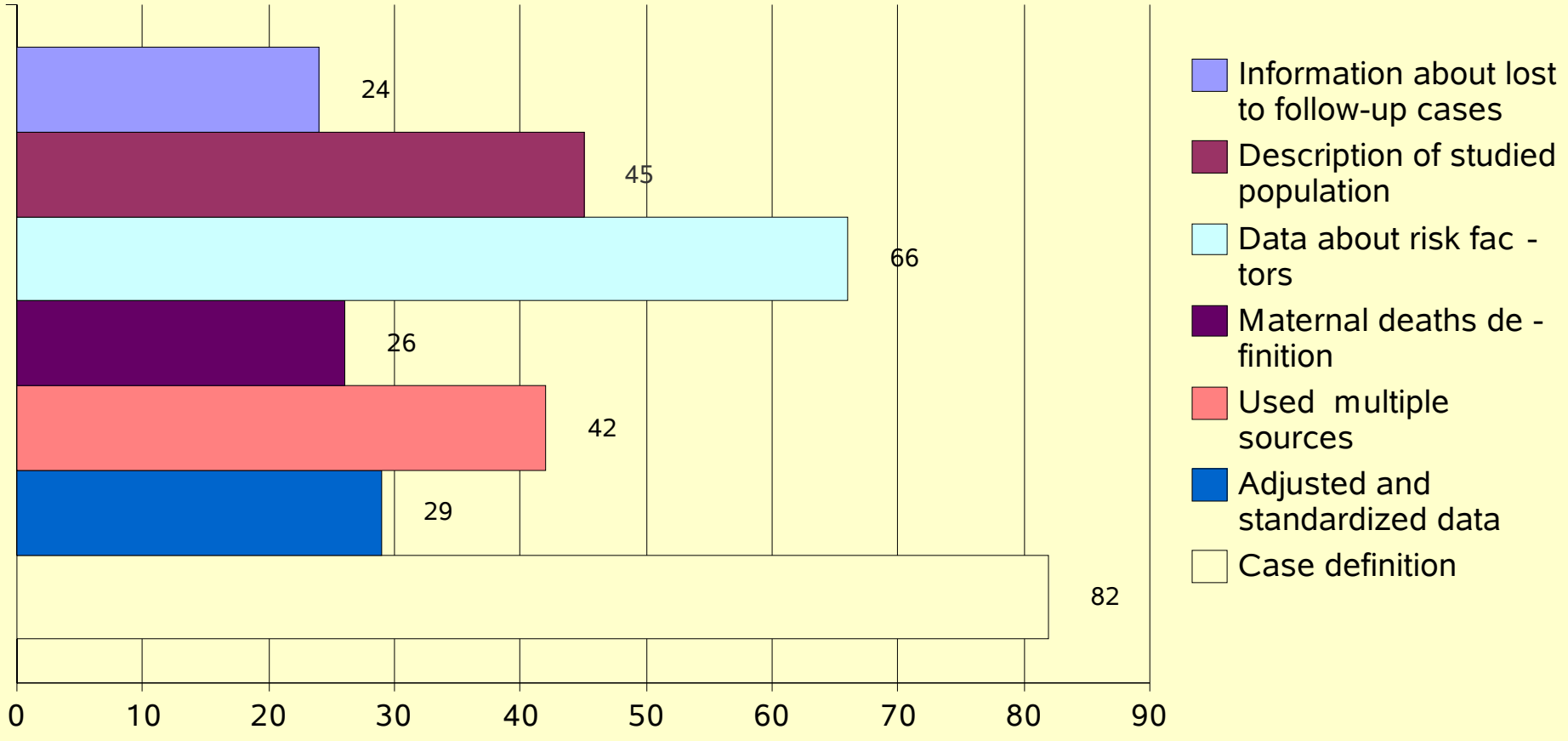
23 studies presented data on only one severe condition

- *5 about admissions to ICU*
- *5 about rupture of uterus*
- *5 about preeclampsia or eclampsia*
- *2 about hysterectomy*
- *All others about placenta accreta, severe liver disease, stroke and cerebral venous thrombosis, acute renal failure, acute abdomen*

15 studies presented data on complex SMM

- *Rupture of uterus*
- *Hemorrhage*
- *Sepsis*
- *Eclampsia/preeclampsia*
- *Dystocia*
- *Thromboembolism*
- *Severe liver disorders*

Quality assessment of studies (%)



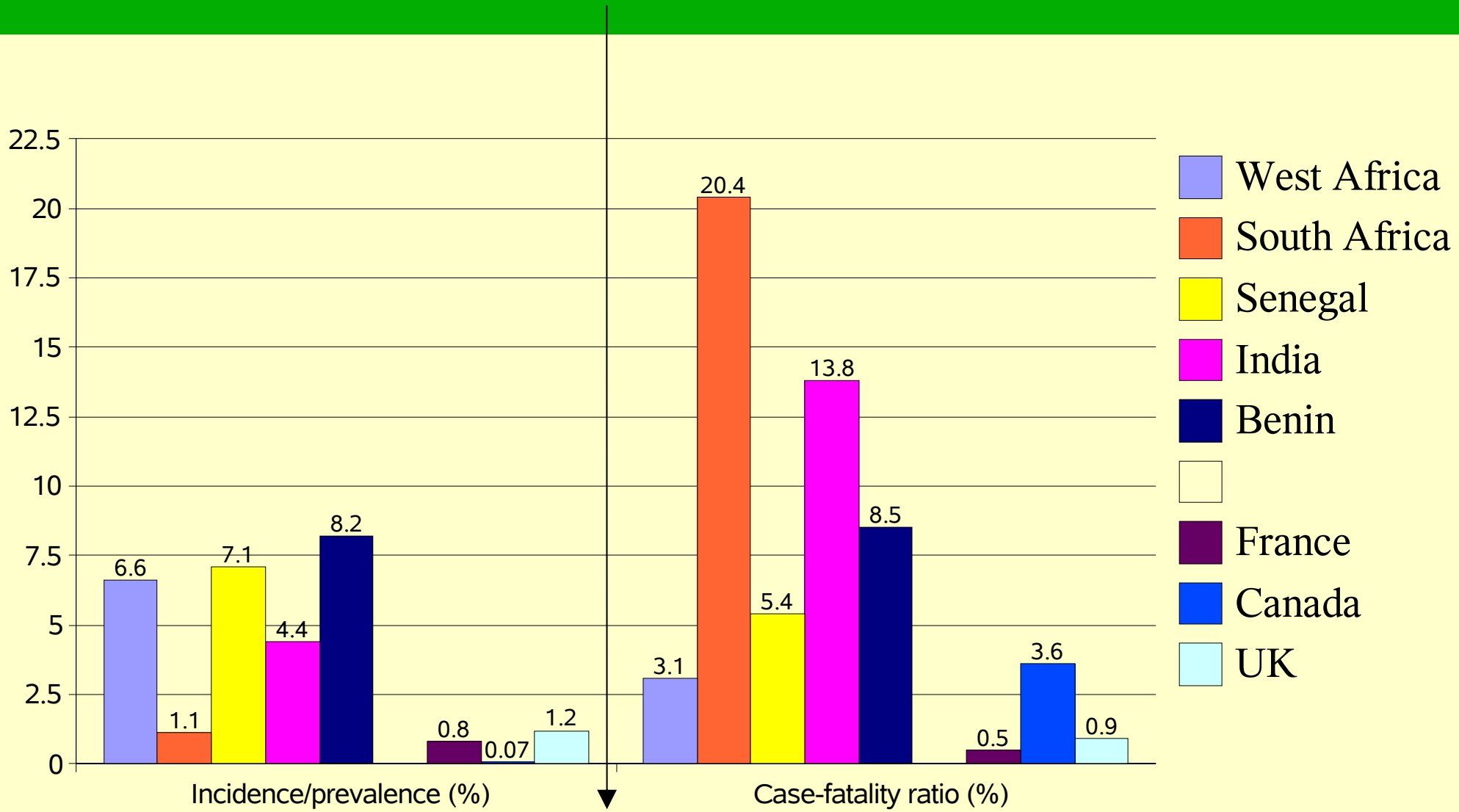
Summary of population-based SMM studies

Location of study	Year of pub.	Sample size	Incid/preval.	Case-fatality (%)
West Africa[1]	*2000*	*20 326*	*6.6*	*1:33*
South Africa[2]	*1998*	*40 006*	*1.1*	*1:5*
Senegal[2]	*2000*	*3 777*	*7.1*	*1:20*
UK[2]	*2001*	*48 865*	*1.2*	*1:111*
France [2]	*2001*	*27 875*	*0.8*	*1:200*

[1]denominator - live births

[2]denominator - deliveries

The incidence/prevalence and case-fatality ratio of SMM studies



Limitations:

- Different definitions of SMM
- Different definitions of every severe condition or disease

3 types of definitions for SMM were used

- *Management-based definition (admission to intensive care, emergency hysterectomy , caesarean section , blood transfusion, hospitalization for more than four days, anaesthetic accidents)*
- *Definitions based on clinical signs and symptoms (haemorrhage, hypertensive disorders and sepsis)*
- *Organ system-based definitions (organ failure or organ dysfunction: renal failure, cardiac decompensation, immunological, coagulation or cerebral dysfunction)*

Definition of severe vaginal bleeding

- ***Blood loss ≥1500 ml if measured or haemorrhage leading to abnormalities of coagulation*** ***(Girard et al, France, 2001)***
- ***Hypovolemic shock requiring any blood transfusion*** ***(Prual et al, Niger, 1998)***
- ***Hypovolemia requiring >5U blood*** ***(Mantel et al, South Africa, 1998)***

Used definitions of sepsis, rupture of uterus, thromboembolism and other diseases are different throughout the studies too.

Conclusions

- *Incidence of SMM ranges from 0.07—8.2%, case-fatality ratio 0.02-37%.*
- *There is big a difference between case-fatality ratio in developing (South Africa 1:5; India and Niger 1:11) and developed countries (UK 1:118; France 1:222).*
- *Studies estimating the incidence of SMM have used different definitions.*
- *Identifying cases of SMM requires sophisticated tools and clear definitions.*
- *Reviewing cases of SMM can provide useful complimentary insights into quality of care.*
- *A good quality medical system is required.*

Future research

- ***SMM is measurable and may be a more meaningful way to measure improvements in health care***
- ***The SMM/MM ratio can possibly be a new indicator of maternal care and could be used to compare improvements in treatments more accurately than mortality data alone***
- ***It is necessary to carry out specific surveys with the appropriate methodologies***

Thank you