

# Systematic Review of Childbearing Patterns and Maternal Mortality

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# Outline

- Background
- Research aims and rationale
- Search methods and results
- Meta-analysis methods and results
- Limitations and main findings
- Implications

# Family Planning and the 5<sup>th</sup> MDG

- 5<sup>th</sup> Millennium Development Goal – reduce the maternal mortality ratio by 75% between 1990 and 2015.
- Utilising family planning as a strategy to reduce maternal mortality ratio through a reduction in high risk pregnancies.
  - Births that are “too soon, too close, too many or too late”.

# Research aims and rationale

- Aims – To produce a systematic literature review to investigate the population based associations between maternal mortality and: i) maternal age, ii) the number of previous pregnancies/births.
- Rationale – these associations have not been systematically studied previously. More recent studies may have used improved maternal mortality ascertainment methods unavailable in the past.

# Search Methods

- We searched for citations in English or Chinese in Pubmed, Embase and POPLINE.
- Inclusion criteria:
  - Study definition of maternal death that falls within the ICD10 definitions of pregnancy or late pregnancy related death.
  - Number of previous pregnancies/births as measured by the study definitions.

# Search Methods

- Exclusion criteria:
  - Study estimates were solely derived from modelling of other variables/populations.
  - Studies that used potentially biased selection methods.
  - Insufficient data (to calculate the strata-specific ORs, <3 exposure categories,  $\geq 20\%$  missing exposure,  $\leq 20$  maternal deaths).

# Search Results

7841 citations  
identified

930 full text  
examined

1 additional study  
identified from  
references.

61 studies included  
in review  
(62 cohorts)

61 studies on  
maternal age  
(62 cohorts)

38 studies on previous  
pregnancies/births  
(38 cohorts)

42 duplications population/period

366 non eligible method,  
participants or outcome types or  
selection methods.

458 insufficient data

3 used matched designed without  
appropriate analyses or information  
for one.

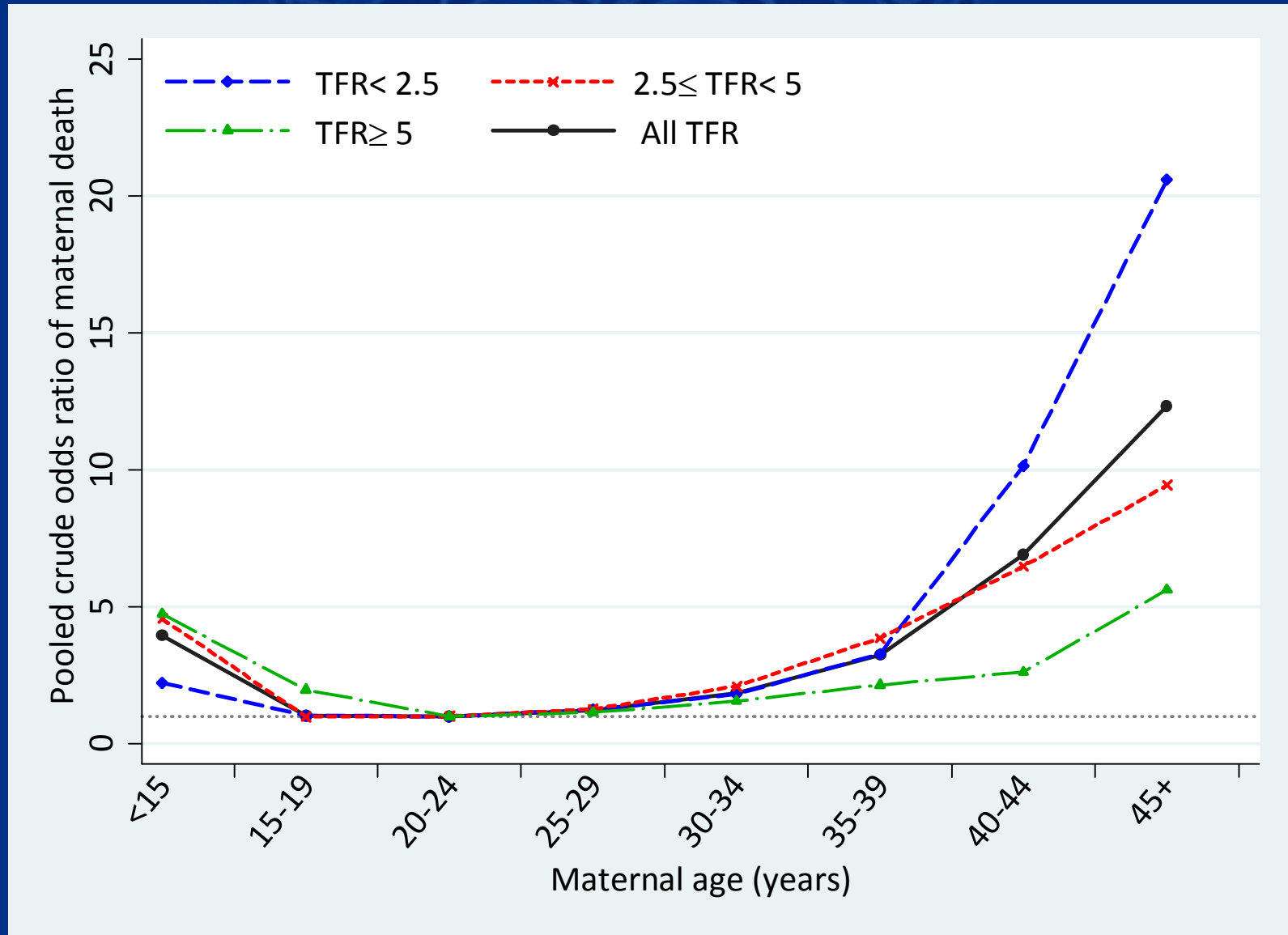
# Meta-analysis methods

- An *a priori* subgroup analysis by region-specific TFR<sup>1</sup> levels.
- Study odds ratios were combined using:
  - Fixed effect model for low/medium heterogeneity.
  - Random effects model for high heterogeneity.

<sup>1</sup>TFR= total fertility rate

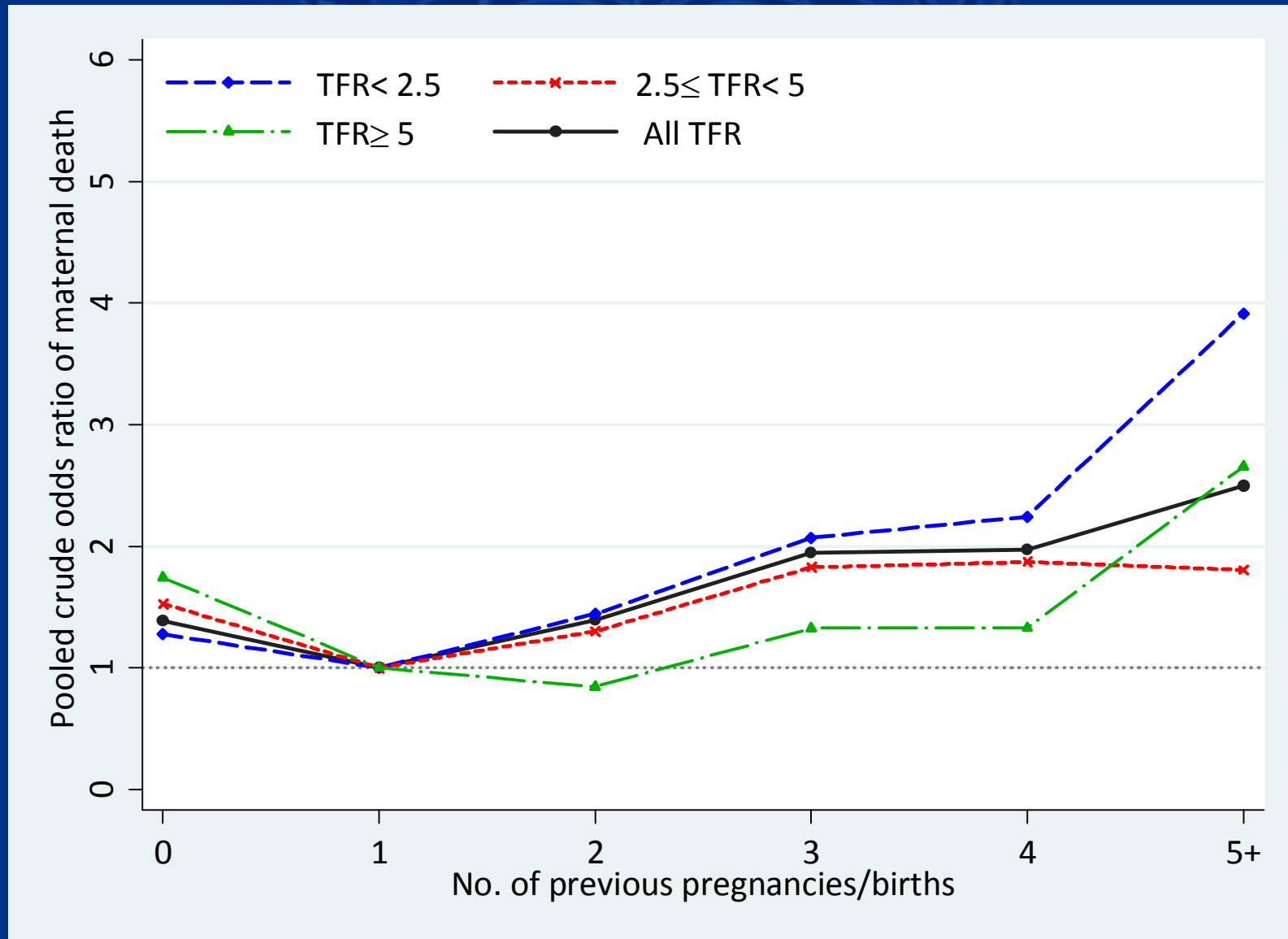
# Maternal age:

older mothers have the lowest ORs in high fertility regions



# Previous pregnancies:

adverse effect of high number of previous pregnancies differed by fertility levels



# Limitations of the review

- Examinations of the crude associations only.
- Language restrictions.
- Lack of consistent and explicit definitions of the number of previous pregnancies/births in the studies.

# Main Findings

- Very young adolescents (<15 years old) and primiparas were found to be at increased odds of maternal death across all fertility groups.
- Women aged 30 or older were at increased odds of maternal deaths independent of fertility levels.
  - Lowest crude ORs in the highest fertility group for older mothers.

# Main Findings

- The threshold number of previous pregnancies at which increased odds of maternal death began varied by fertility levels.
  - Higher TFR = higher threshold.
- There were too few studies that adjusted for confounders to draw conclusions about the causality of any of the associations.

# Implications

- Pregnant adolescents should be considered as two separate, heterogeneous groups.
- Delaying childbearing to 25 or 30 years old could carry increased risk of adverse effect to the mother.
- The use of family planning:
  - Can reduce maternal mortality rate.
  - Changing the childbearing patterns is unlikely to reduce the maternal mortality ratio by very much.

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