

Male fertility patterns and trends around the World

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Children, Mothers and Measuring Fertility:
New Perspectives on the Own Child Method

Background

- ▶ Sharp contrast between knowledge on female and male fertility
 - ▶ In many countries, even simple facts about male reproduction are not known
 - ▶ Data collection has focused on female fertility
 - Methods developed in a Western context, assumption of identical interests and behavior
 - Ignores specificities of male fertility
 - ▶ Some data available and untapped
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Objectives

- ▶ Documenting male fertility around the world
 - Male age-specific fertility rates
 - How many children ?
 - At what ages ?
 - ▶ Comparisons with females
 - Levels, age patterns, transitions
 - Convergence ?
 - ▶ Own children method : strengths and limitations
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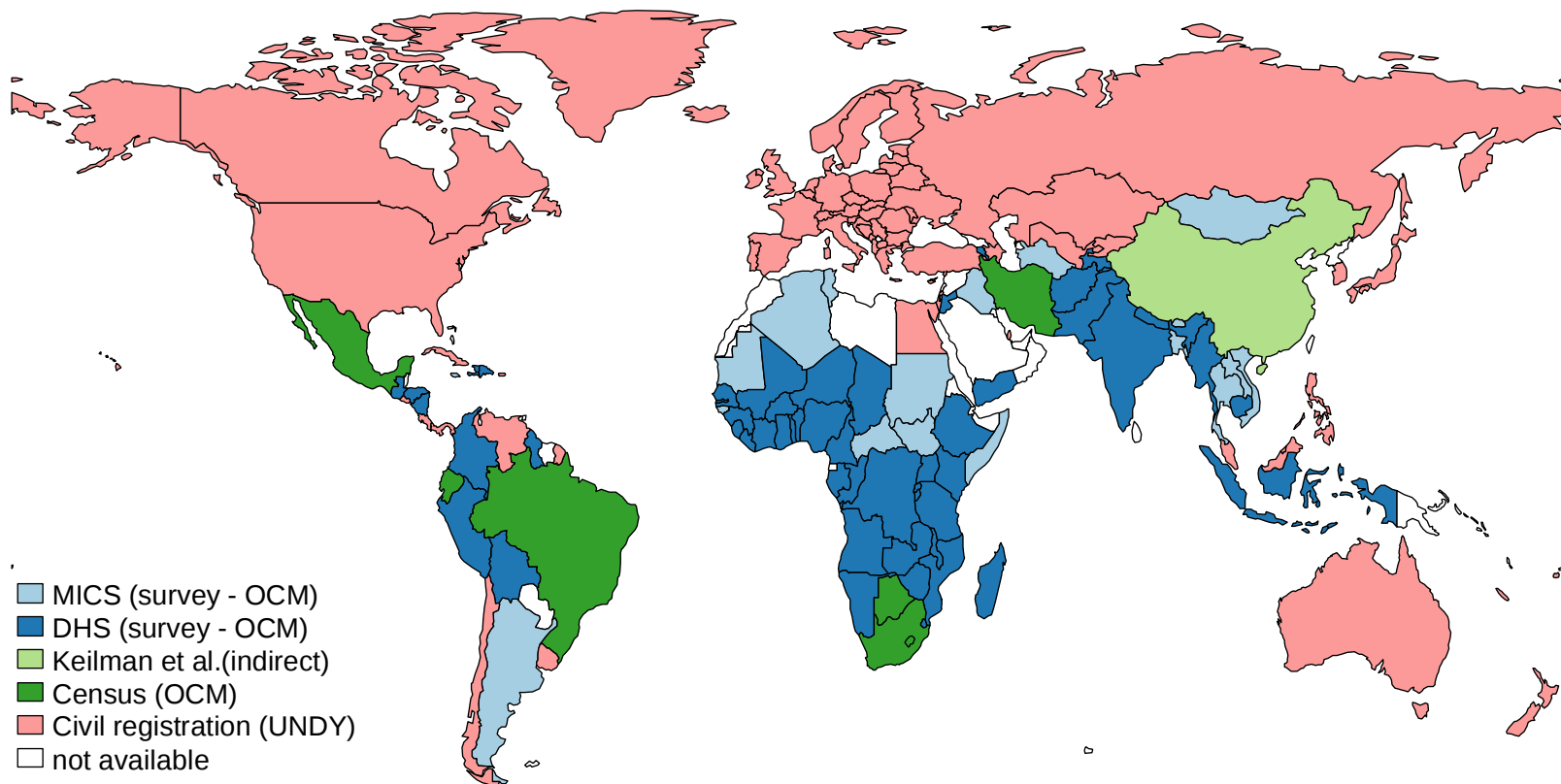
Measuring male fertility

Available data and methods

- ▶ Civil registration systems (CRVS) and censuses
 - Births by age of the father / number of males by age
 - ▶ Censuses or surveys (DHS/MICS)
 - Own children method
 - Parity increment methods
 - Date of last birth method
 - ▶ Indirect approaches
 - Deriving male TFR from female TFR
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Data sources and methods

146 countries, circa 2010



Measuring male fertility with the own children method

Data

- ▶ Demographic and Health Surveys, MICS, Censuses (IPUMS)
 - Widely available (more than 100 countries), often at several dates
 - ▶ Household questionnaire
 - Link between each surviving child and his/her father if living in the same household
 - ▶ Several approaches depending on type of data
-

Surviving children and fathers

(DHS, household survey)

PARENTAL SURVIVORSHIP AND RESIDENCE OF PERSONS LESS THAN 15 YEARS OLD										
LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD*	RESIDENCE		SEX	AGE**				
			Does (NAME) usually live here?	Did (NAME) stay here last night?	Is (NAME) male or female?	How old is (NAME)?	Is (NAME)'s biological mother alive?	IF ALIVE: Does (NAME)'s biological mother live in this house hold? IF YES: What is her name? RECORD MOTHER'S LINE NUMBER. IF NOT LIVING IN HOUSEHOLD WRITE '00'.	Is (NAME)'s biological father alive?	IF ALIVE: Does (NAME)'s biological father live in this house hold? IF YES: What is his name? RECORD FATHER'S LINE NUMBER. IF NOT LIVING IN HOUSEHOLD WRITE '00'.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(20)	(21)	(22)	(23)
			YES NO	YES NO	M F	IN YEARS	YES NO DK		YES NO DK	
01			1 2	1 2	1 2		1 2 8		1 2 8	
02			1 2	1 2	1 2		1 2 8		1 2 8	
03			1 2	1 2	1 2		1 2 8		1 2 8	

Own children method

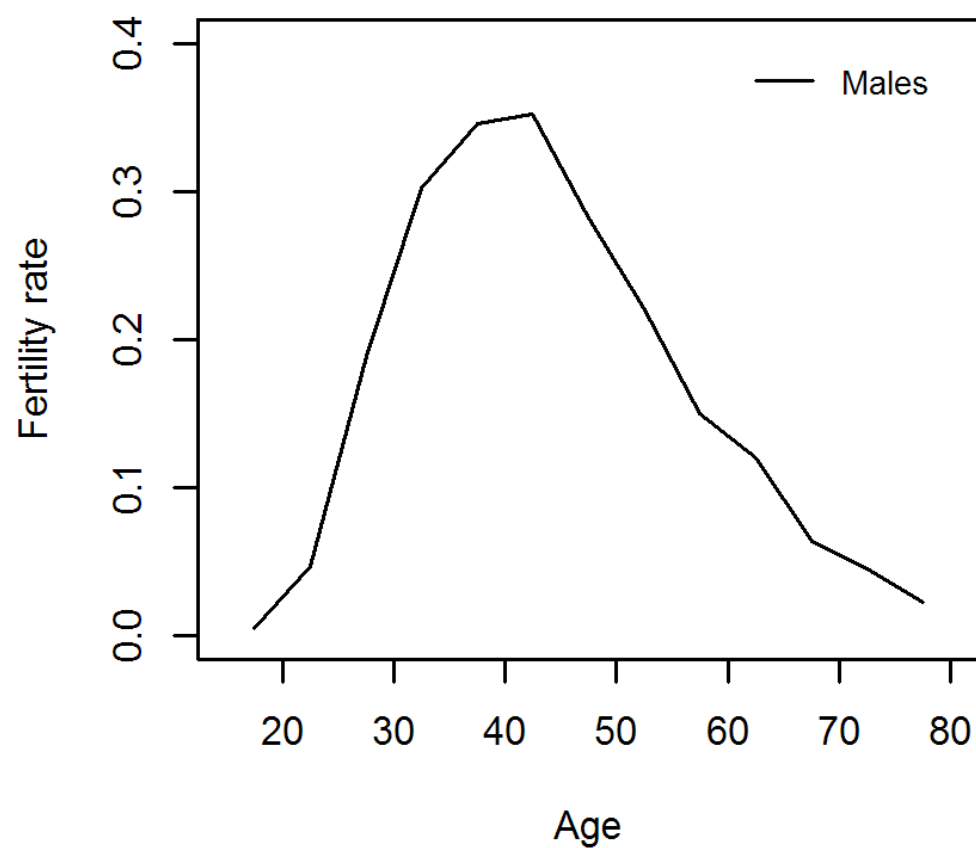
- ▶ Drop children whose father is deceased
 - If information on survival status available
 - Makes it unnecessary to reverse survive males
 - ▶ Match children with fathers if living in the same household
 - Straightforward with DHS, MICS and Census data
 - ▶ Link unmatched children to possible fathers
 - Imputation of age of father of unmatched children
 - Age of father imputed using child's age and mother's age
 - Random imputation
 - Link to a male of the same age as imputed age
-

Own children method

- ▶ Reverse survive children
 - With DHS and MICS → Survival probabilities from female birth histories are used
 - With census data → UN mortality data
 - ▶ *Reverse survival males*
 - Only if survival status of father not collected
 - ▶ Age specific fertility rates (5-year age groups)
 - TFRs (15–79), mean age at fatherhood
 - TFRs by year for 15 years preceding the survey
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Male age-specific fertility rates

Senegal 2014



2009–2014

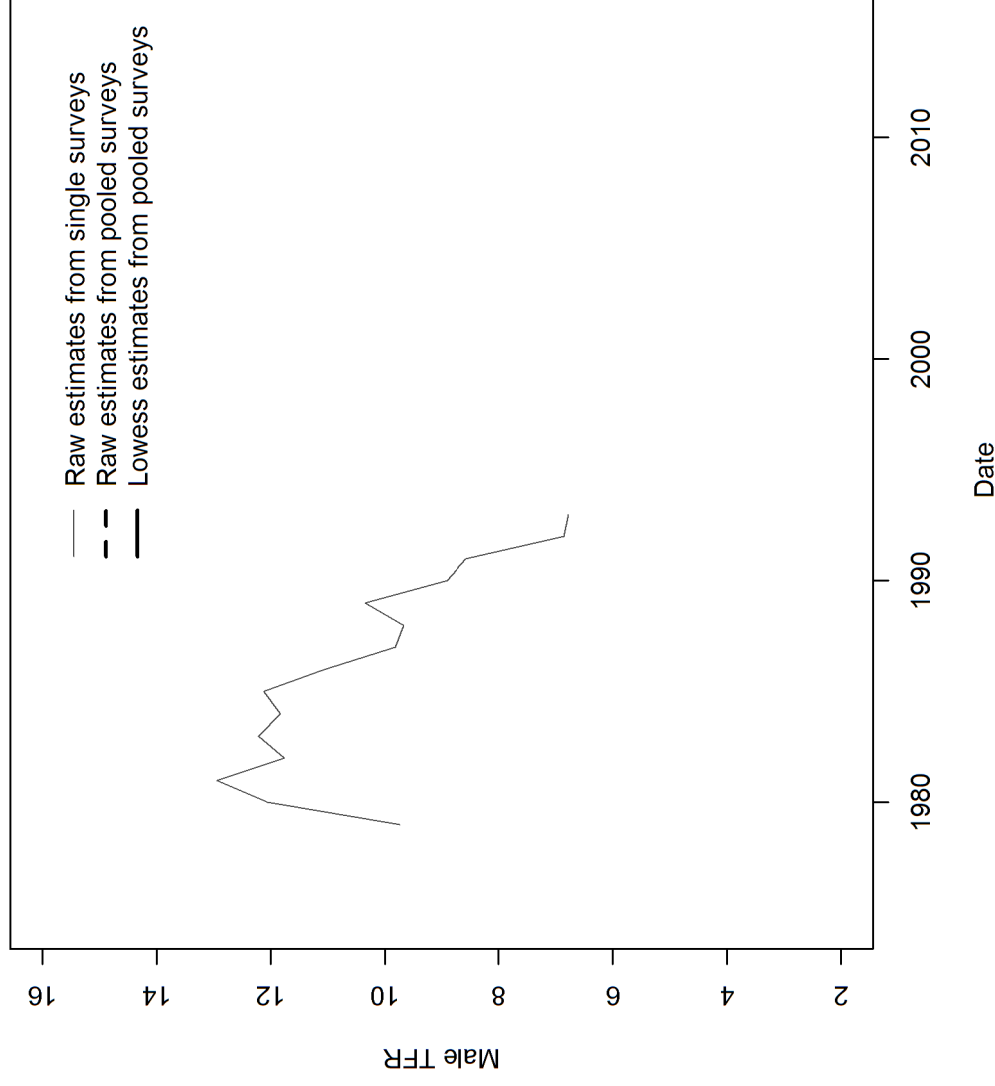
TFR=10.7

Mean age at
Fatherhood: 44 yrs

Data : DHS

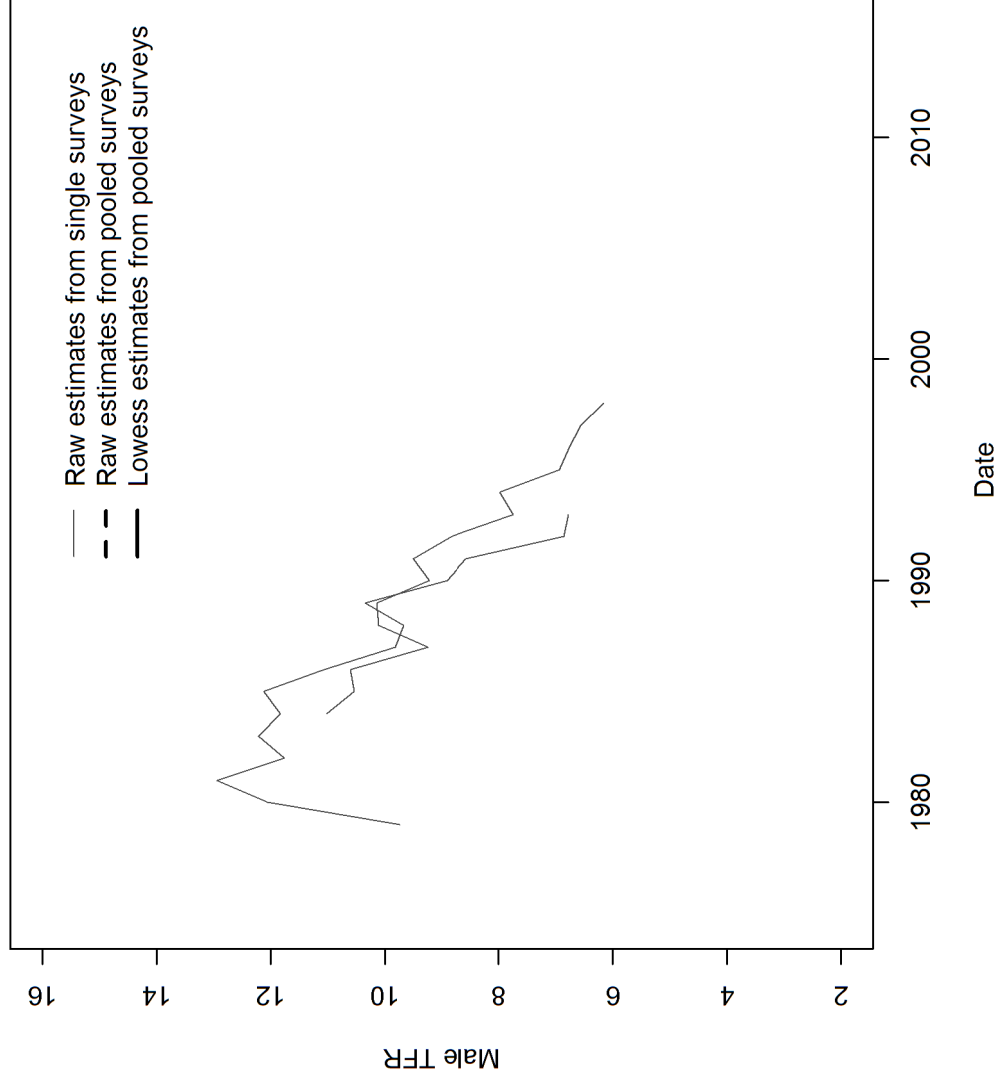
Reconstruction of Male TFRs

Zimbabwe



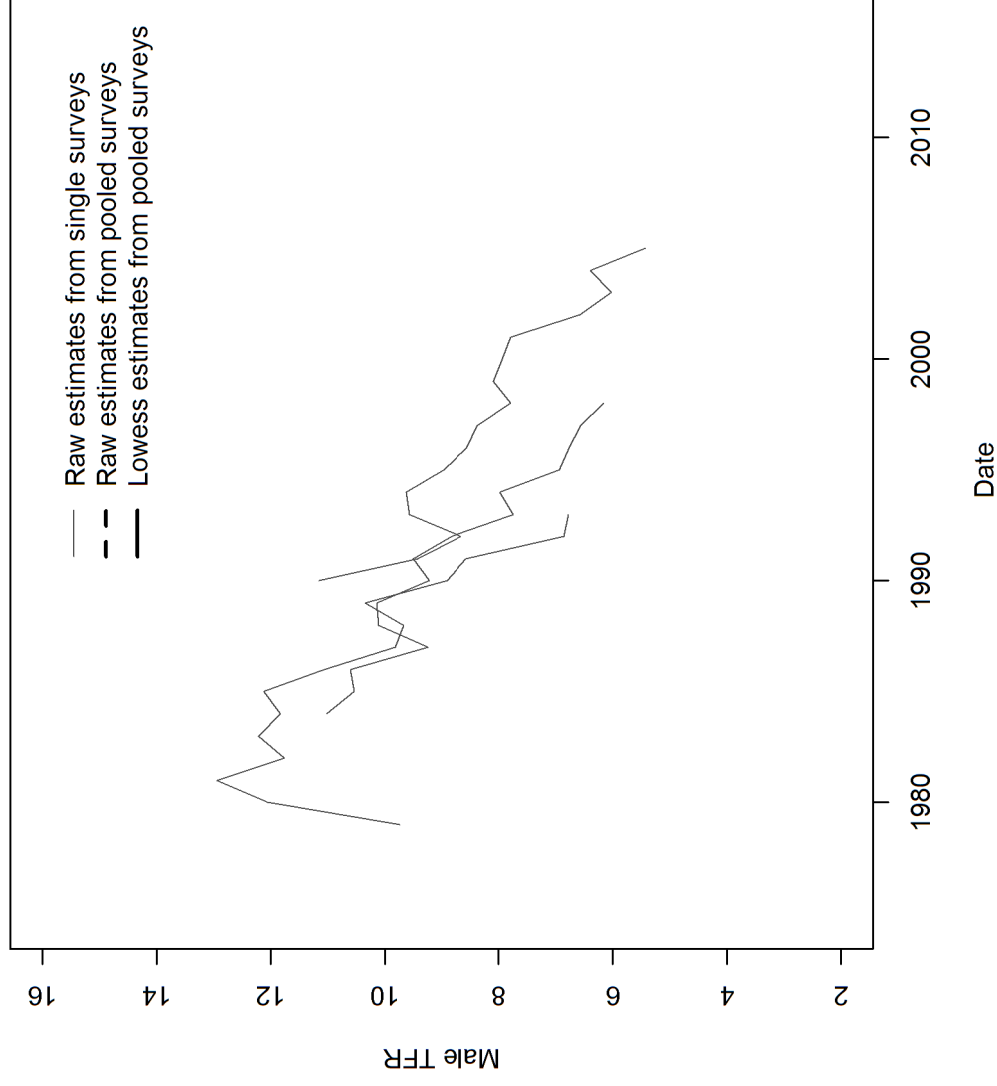
Reconstruction of Male TFRs

Zimbabwe



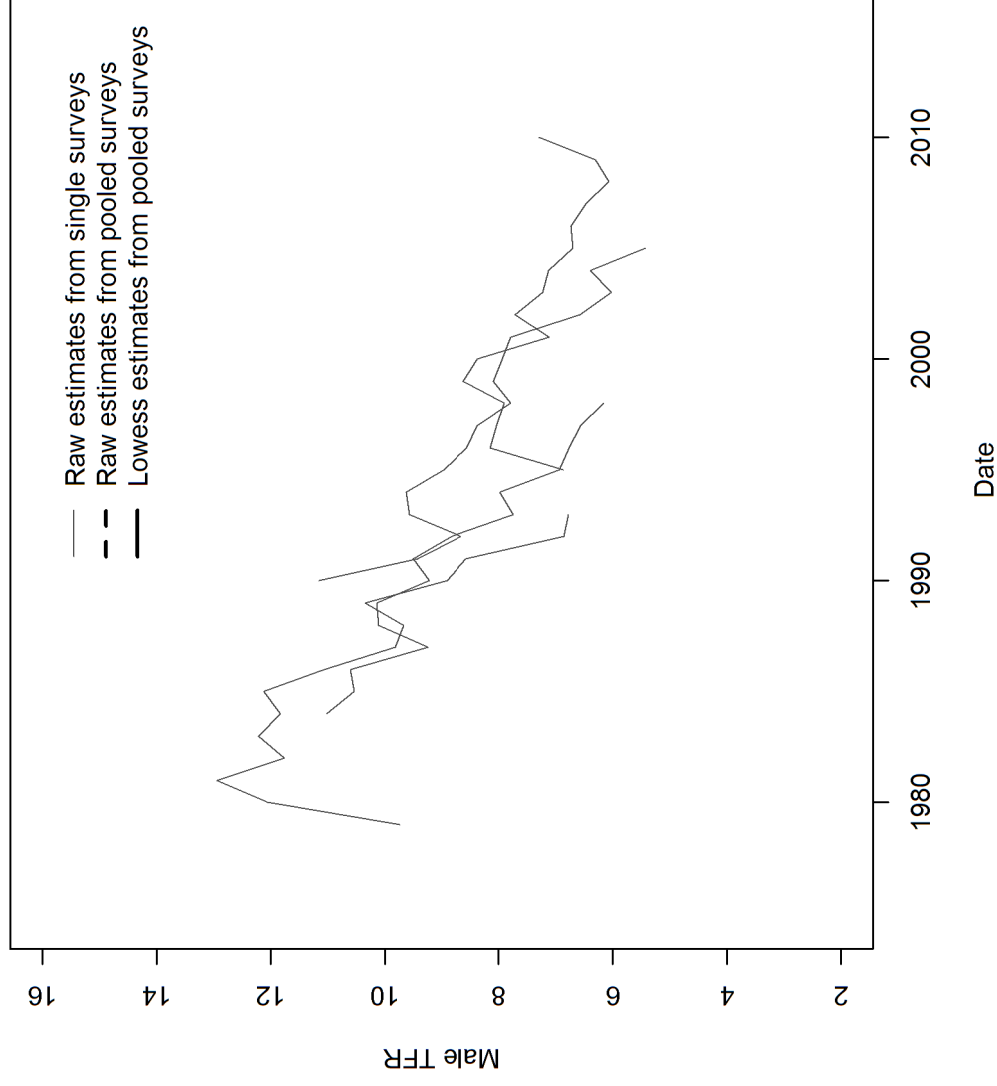
Reconstruction of Male TFRs

Zimbabwe



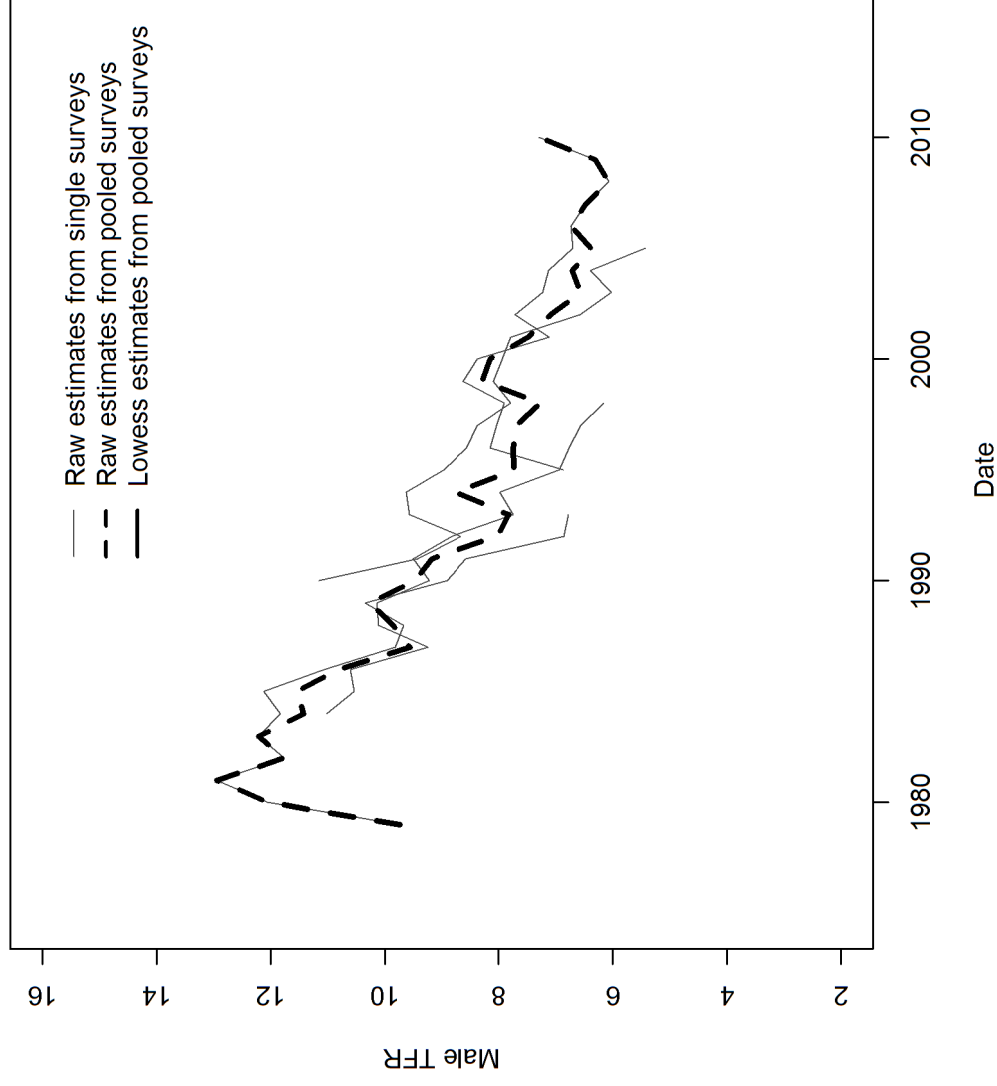
Reconstruction of Male TFRs

Zimbabwe



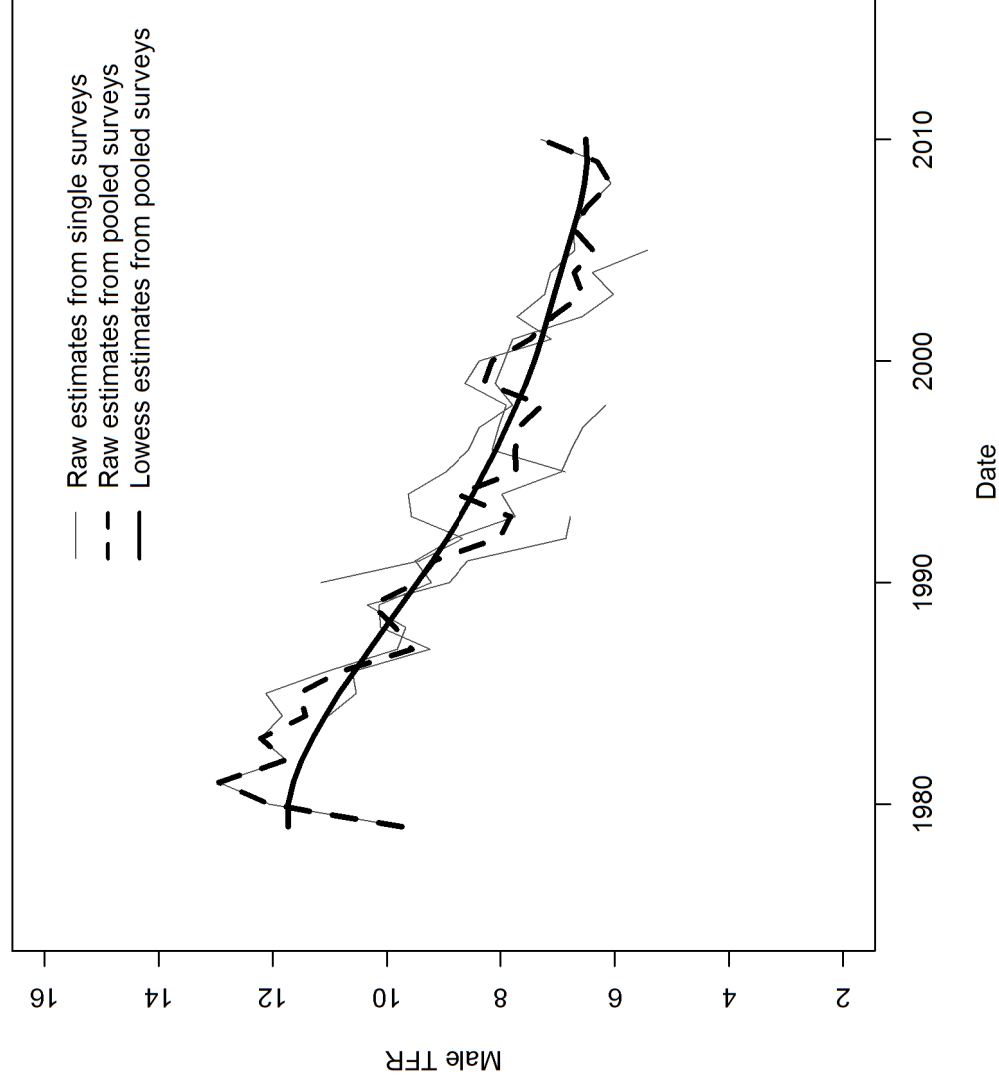
Reconstruction of Male TFRs

Zimbabwe



Reconstruction of Male TFRs

Zimbabwe



Strengths and limitations of the own children method for documenting male fertility

Strengths

- ▶ Full age range of male fertility (15–79+)
 - ▶ Widely available data
 - Possible with virtually all DHS surveys & many MICS and Censuses
 - ▶ Possible to reconstruct fertility trends
 - ▶ More reliable than other available methods
 - Does not rely on fathers' reporting of children
 - Same numbers of births for males and females
 - Comparisons with other methods and CRVS indicate OC is more reliable
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Limitations and challenges

- ▶ Affected by the the quality of age reporting and underreporting of children
 - ▶ Data on link between child/father needed
 - Often 20–25% of unmatched children
 - Up to 60–70% in some settings
 - Social father may be reported
 - ▶ Possibly affected by migration of fathers
 - Same issue with CRVS data, but not with birth histories
 - ▶ Assumptions needed to analyze fertility differentials
 - For matching children to fathers, mortality differentials
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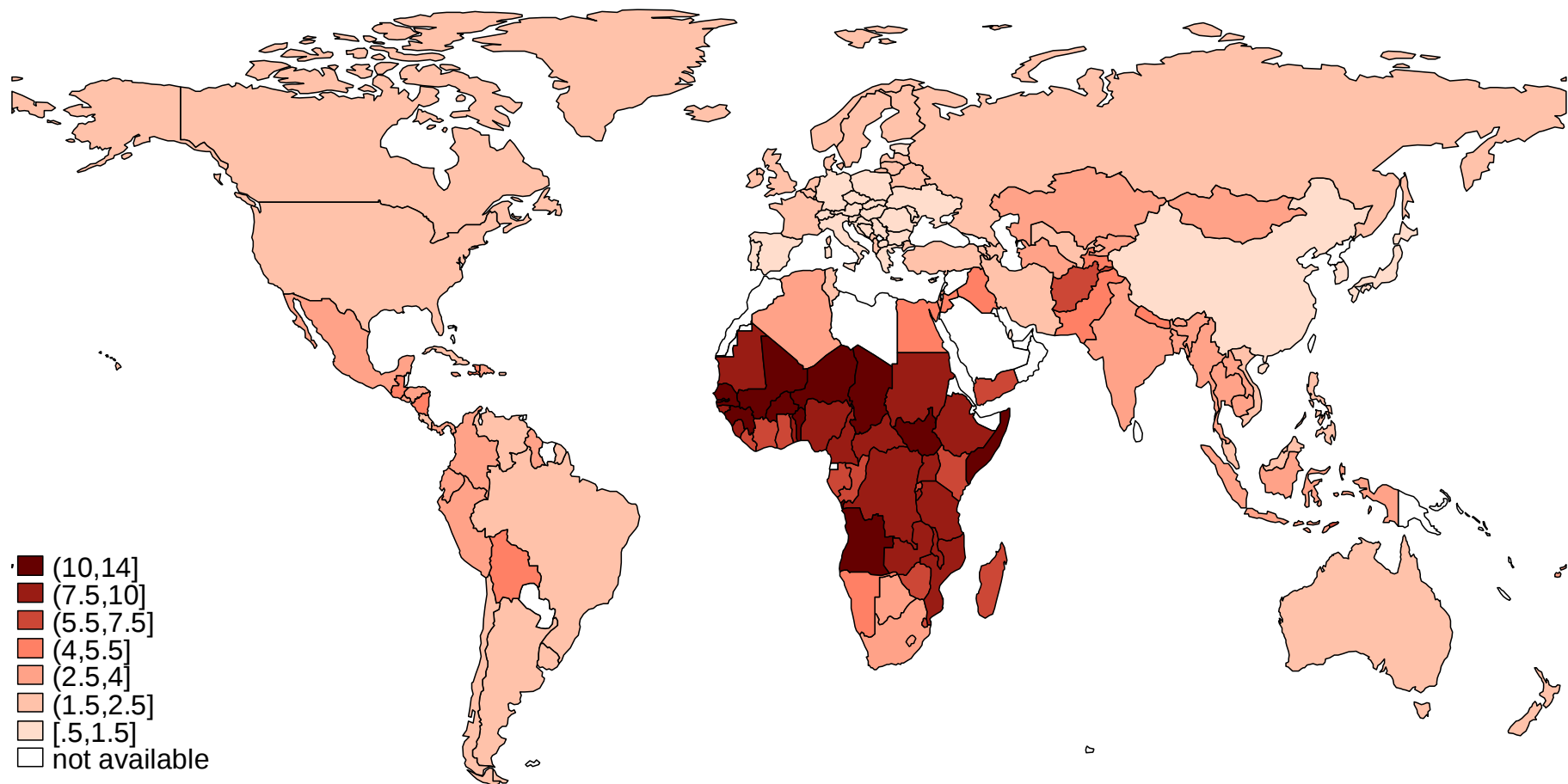
Male fertility around the world

How many children & at what age ?



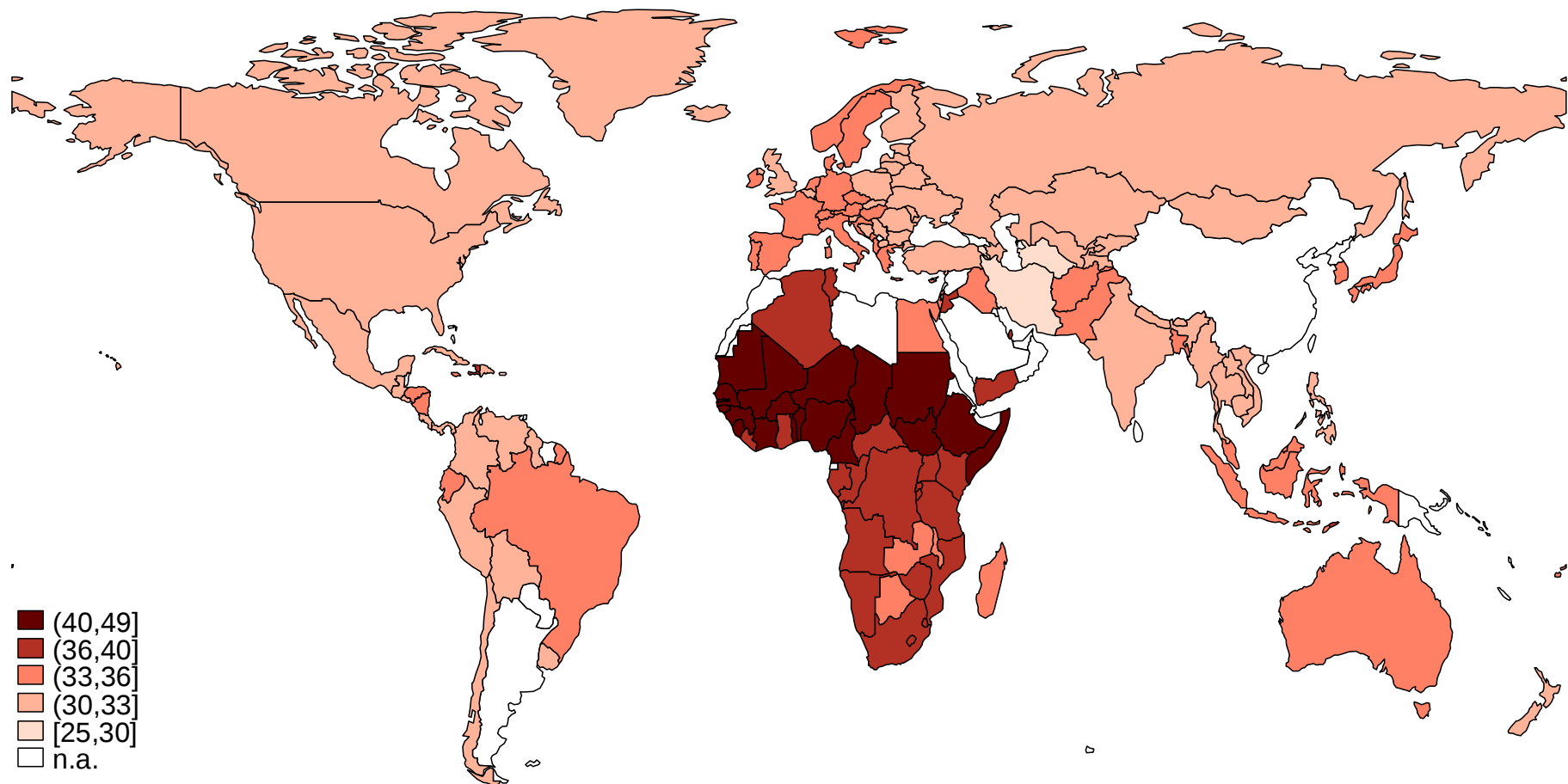
Male fertility around the World

between 1 and 13 children on average



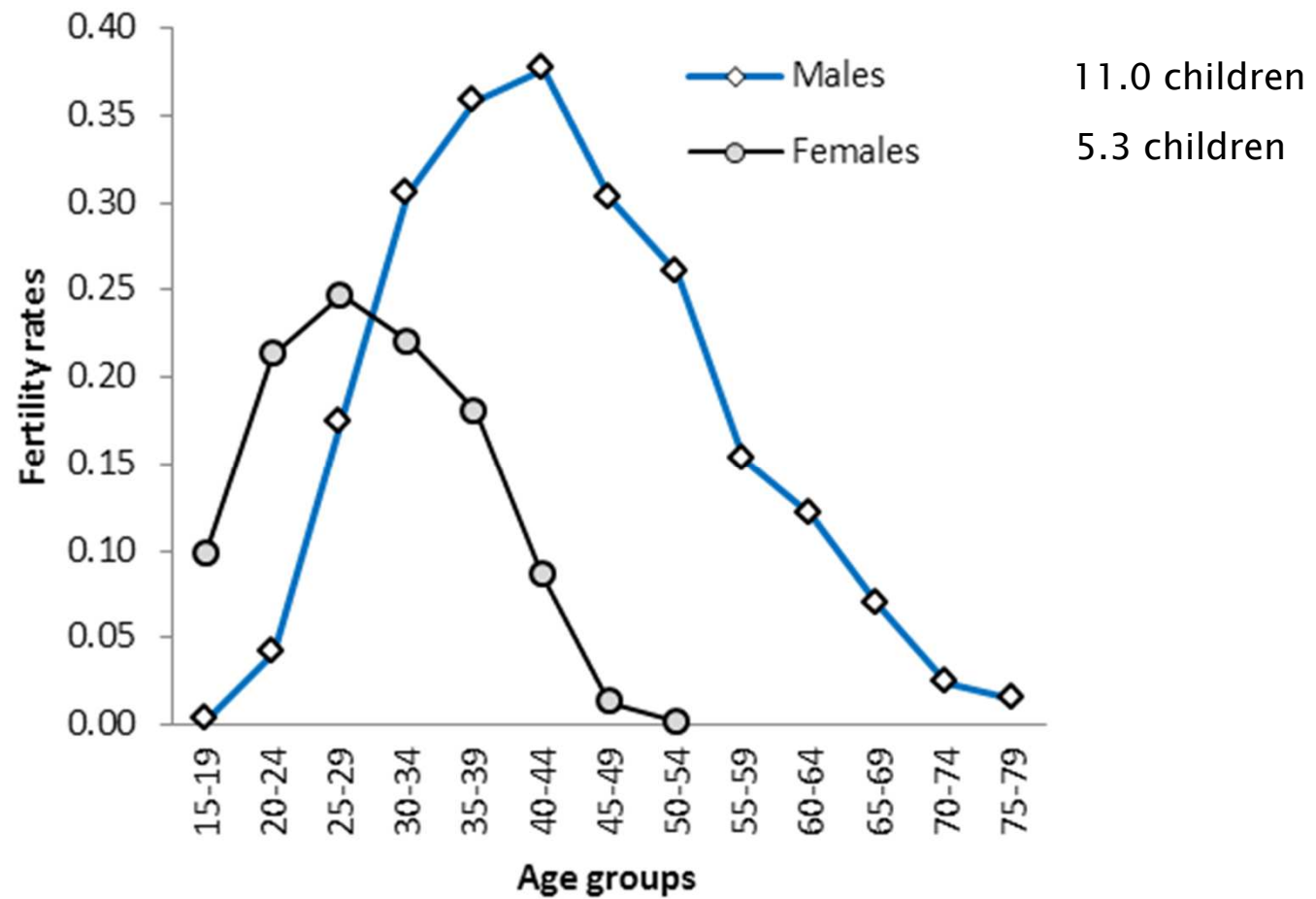
Male fertility around the World

Mean age at fatherhood : from 29 to 46 years

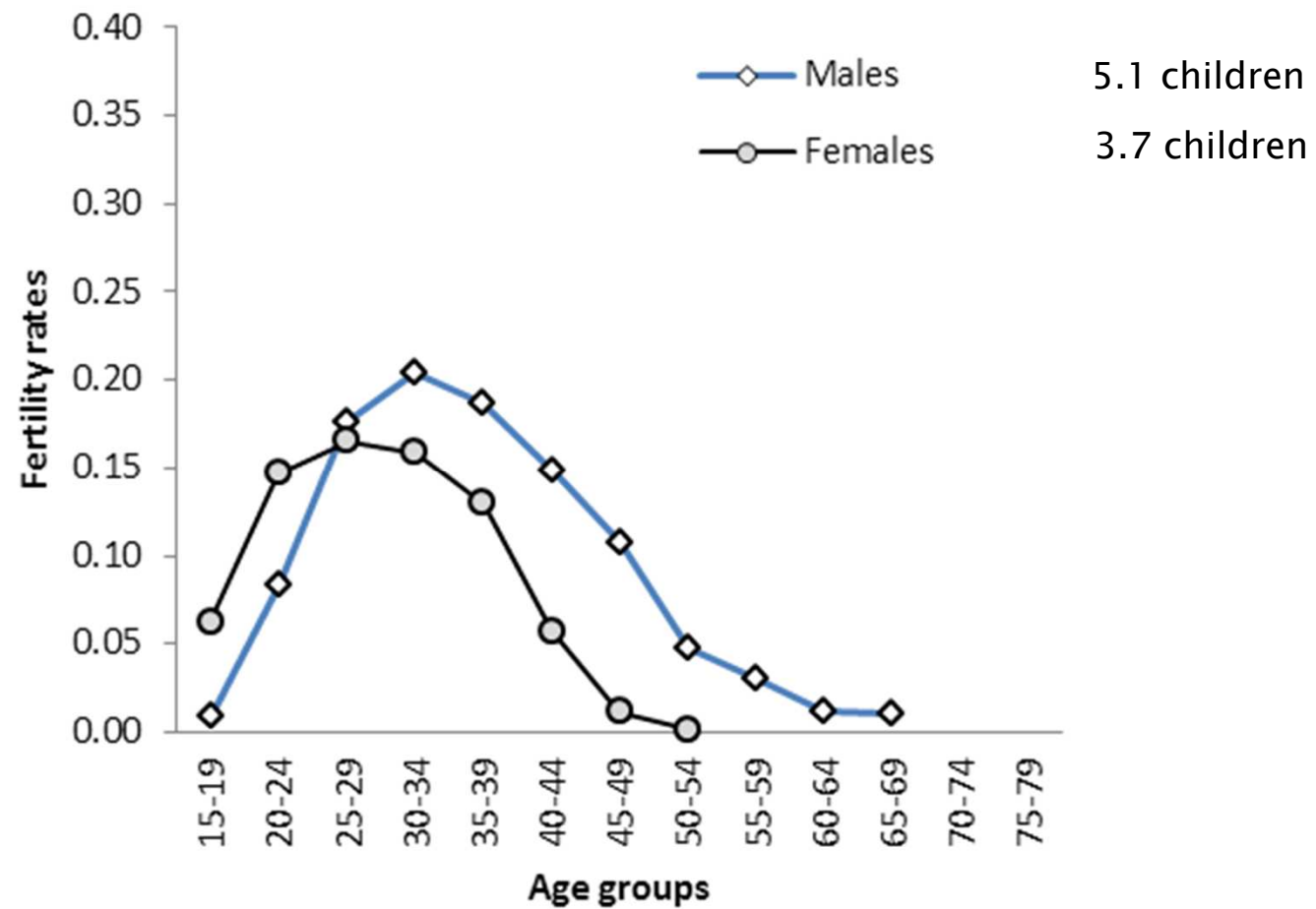


Male-female comparisons

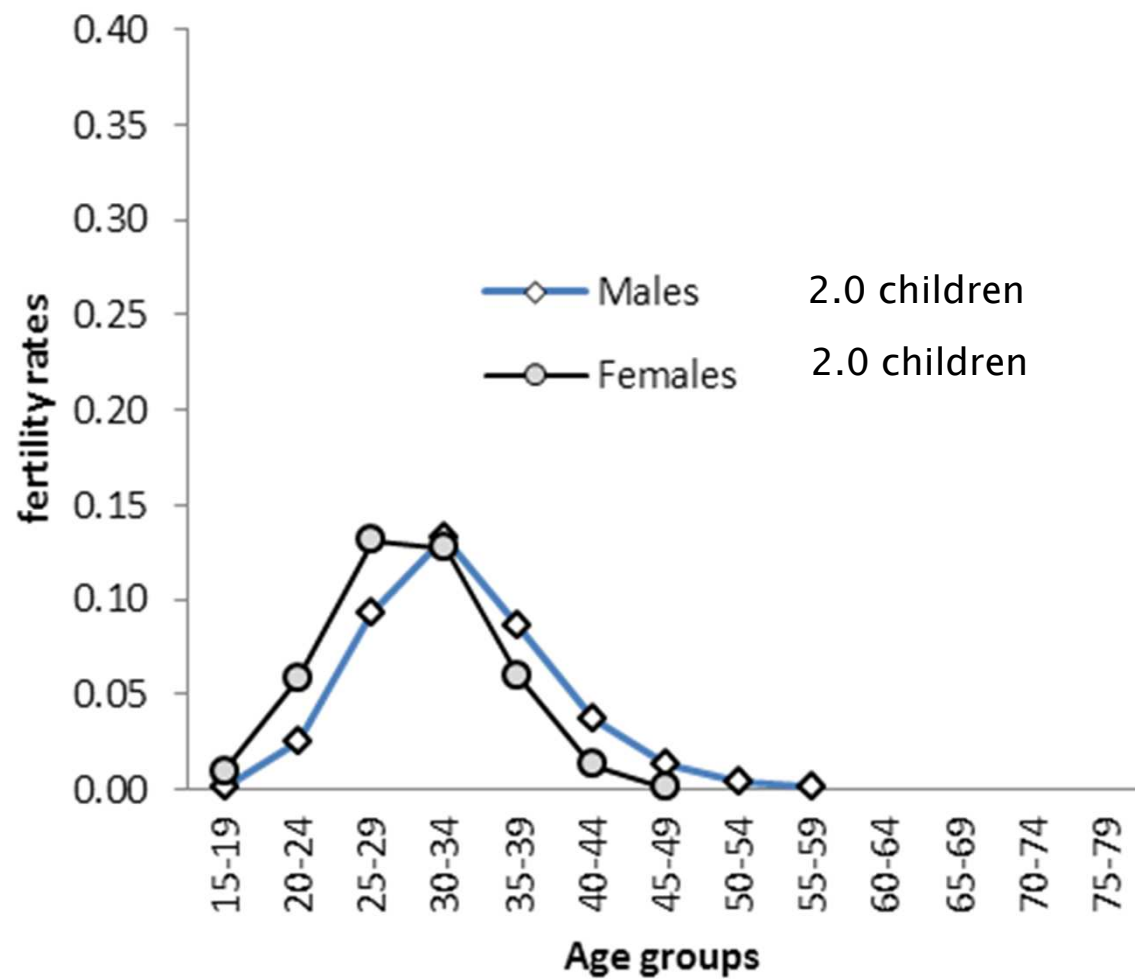
Senegal



Haiti

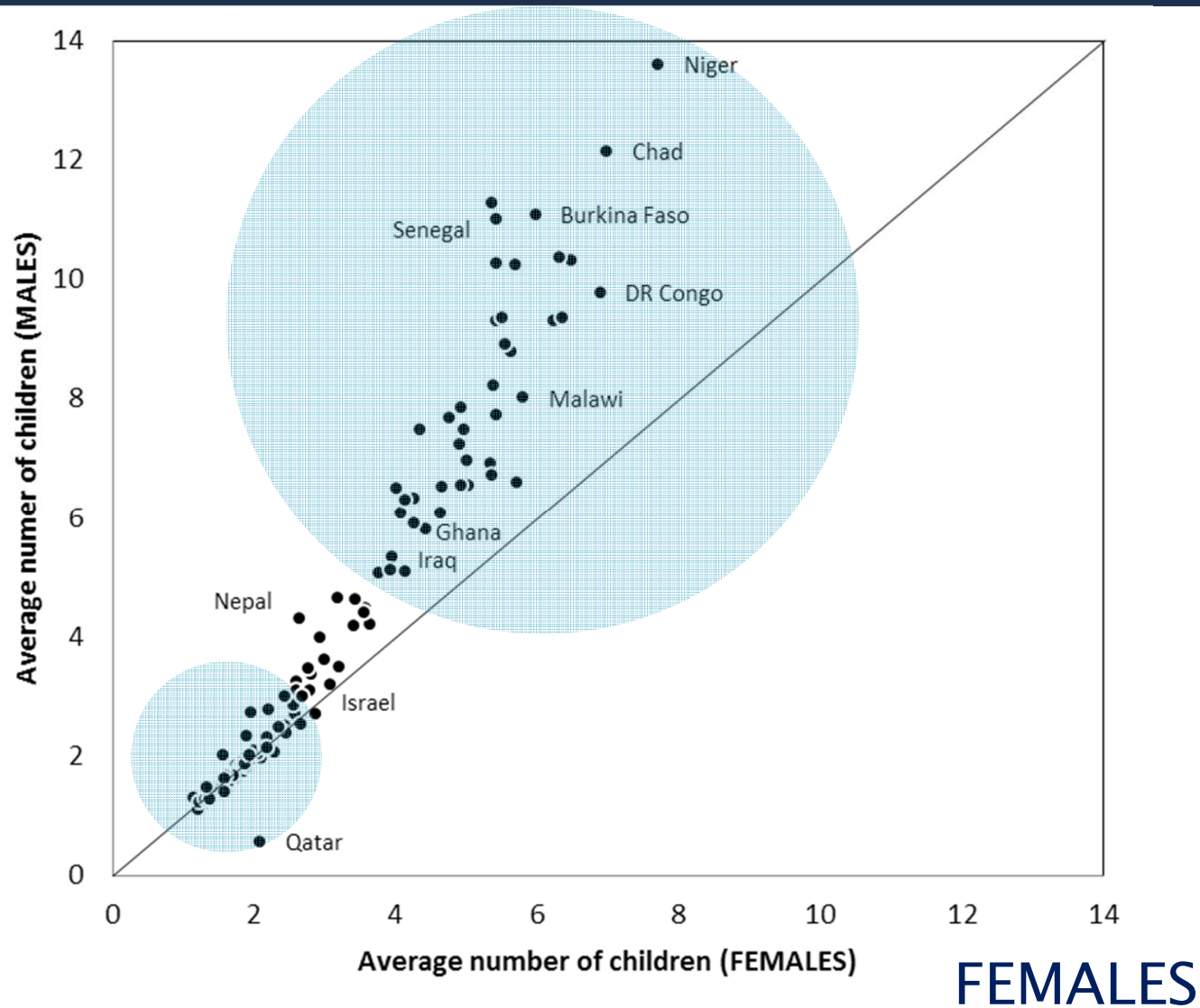


France



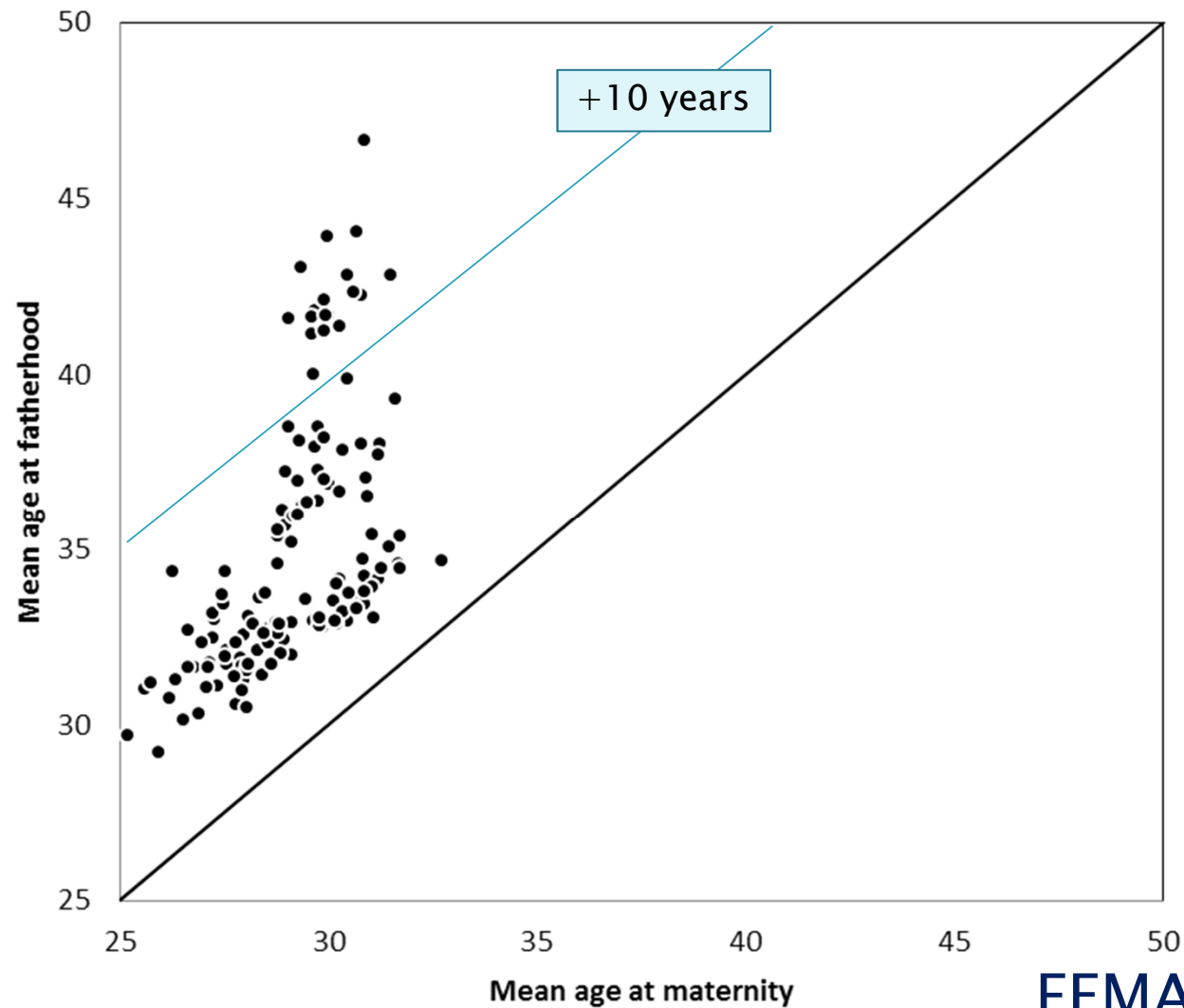
Total fertility

MALES



Mean age at fertility

MALES



FEMALES

Relationship between male and female fertility in a stable population

$$\ln \left(\frac{\text{TFR}^{\text{M}}}{\text{TFR}^{\text{F}}} \right) = \ln \left(\frac{1}{\text{SRB}} \right) + \ln \left(\frac{p(\text{MAC})}{p(\text{MAF})} \right) + r \cdot (\text{T}^{\text{M}} - \text{T}^{\text{F}})$$

$$\ln \left(\frac{\text{TFR}^{\text{M}}}{\text{TFR}^{\text{F}}} \right) \sim r \cdot (\text{T}^{\text{M}} - \text{T}^{\text{F}})$$



Growth rate

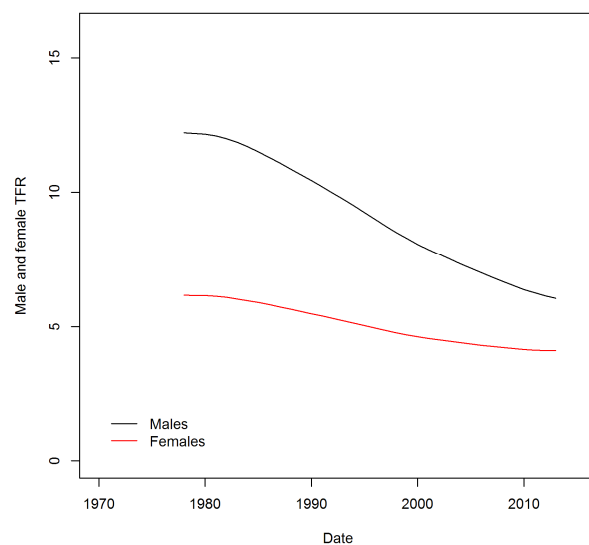
The diagram consists of two blue arrows originating from the equation above. One arrow points from the variable 'r' to the text 'Growth rate'. The other arrow points from the expression '(T^M - T^F)' to the text 'Difference in mean length of generations (~ difference in mean age at fertility)'.

Difference in mean length
of generations (~ difference
in mean age at fertility).

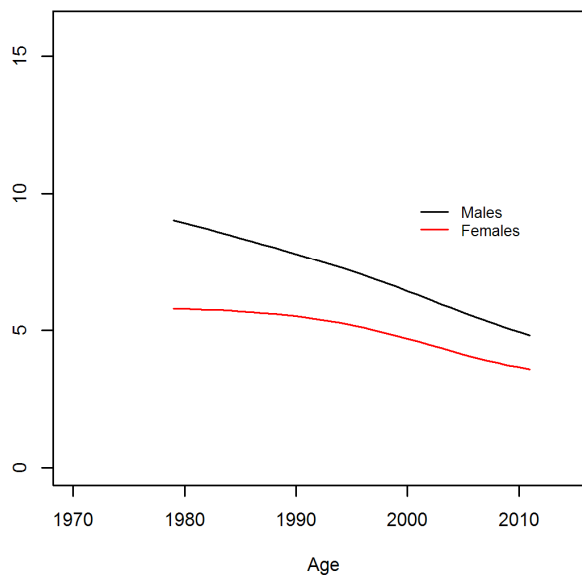
Male and female fertility changes

Male and female fertility transitions

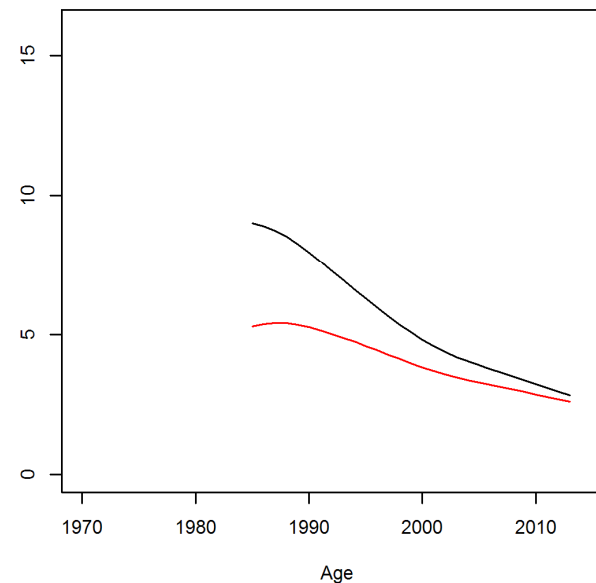
Ghana



Haiti



Cambodia



Conclusion

- ▶ Male age-specific fertility rates can be estimated with existing data
 - Own children method
 - Large number of countries, full age range, fertility trends
 - ▶ Male and female fertility differ widely in some countries
 - In high fertility countries, Male TFR $\gg$ Female TFR
 - Very different fertility experiences
 - ▶ Two transitions
 - Convergence between male and female TFR with fertility transition
 - ▶ Further research
 - Refinement of methods
 - Fertility differentials
 - reconstructing birth histories $\rightarrow$ micro analyses, parity progression, etc.
 - Back to theories
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Thank you