



Documenting Male Fertility in
Developing Countries with
Demographic and Health Surveys
An Assessment of Three Methods

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Background

- Little research on male fertility
 - Fertility research first formulated in a western context (Greene & Biddlecom, 2000)
 - Assumption of coincident interests and behavior
 - Lack of data, data quality
- Why study male fertility
 - Own reproductive interests and experience
 - Theoretical and practical implications
 - Interests for other fields, methodological reasons, etc.
- Data widely available but untapped

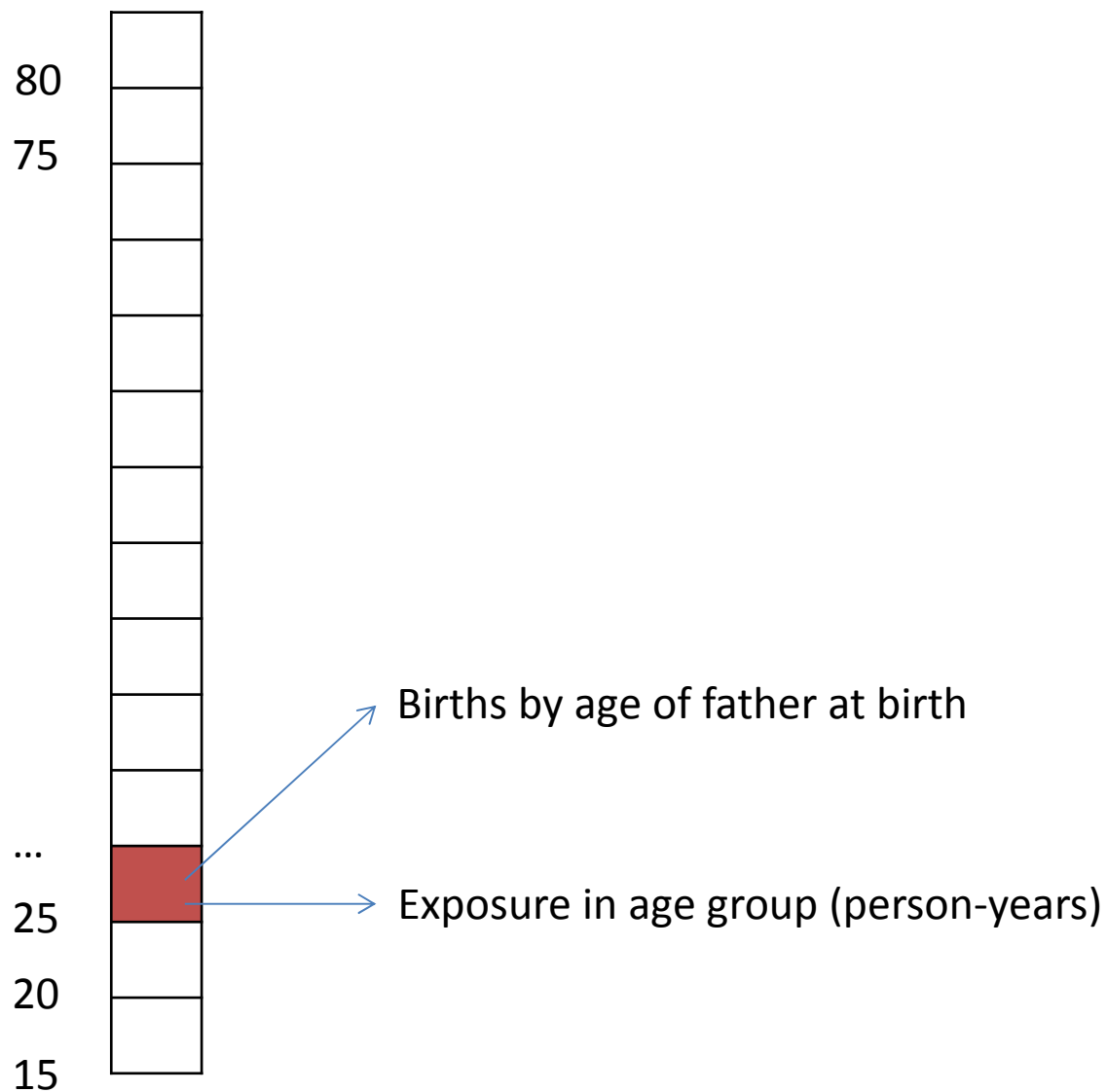
Objectives

- Measuring age-specific fertility rates in developing countries with existing data
 - Demographic and Health Surveys
 - Comparison of 3 methods
- Descriptive results
 - Levels, age patterns and trends
 - Comparisons with female fertility
 - Different experiences
 - Convergence over time

Demographic and Health surveys

- Widely available
 - More than 300 surveys conducted in developing countries since the mid 1980s
 - Open access data
 - Standardized
- 3 questionnaires
 - Household questionnaire (all surveys)
 - Women's questionnaire (all surveys)
 - Men's questionnaire (most surveys), usually up to ages 59 or 64

Period age-specific male fertility rates



Data on male fertility in DHS

- No birth history
- Limited data in some men's surveys
 - Date of birth of last child
 - Number of children ever born
- Useful data in household surveys
 - Surviving children, father's line number if father in the household, father's survival status

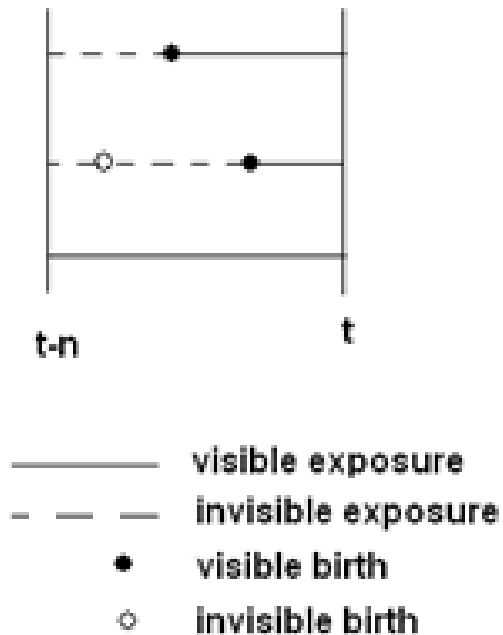
DATE OF LAST BIRTH

Date of last birth (men's surveys)

M211	In what month and year was your last child born?	MONTH <input type="text"/> <input type="text"/> YEAR <input type="text"/> 1 <input type="text"/> 9 <input type="text"/> <input type="text"/>
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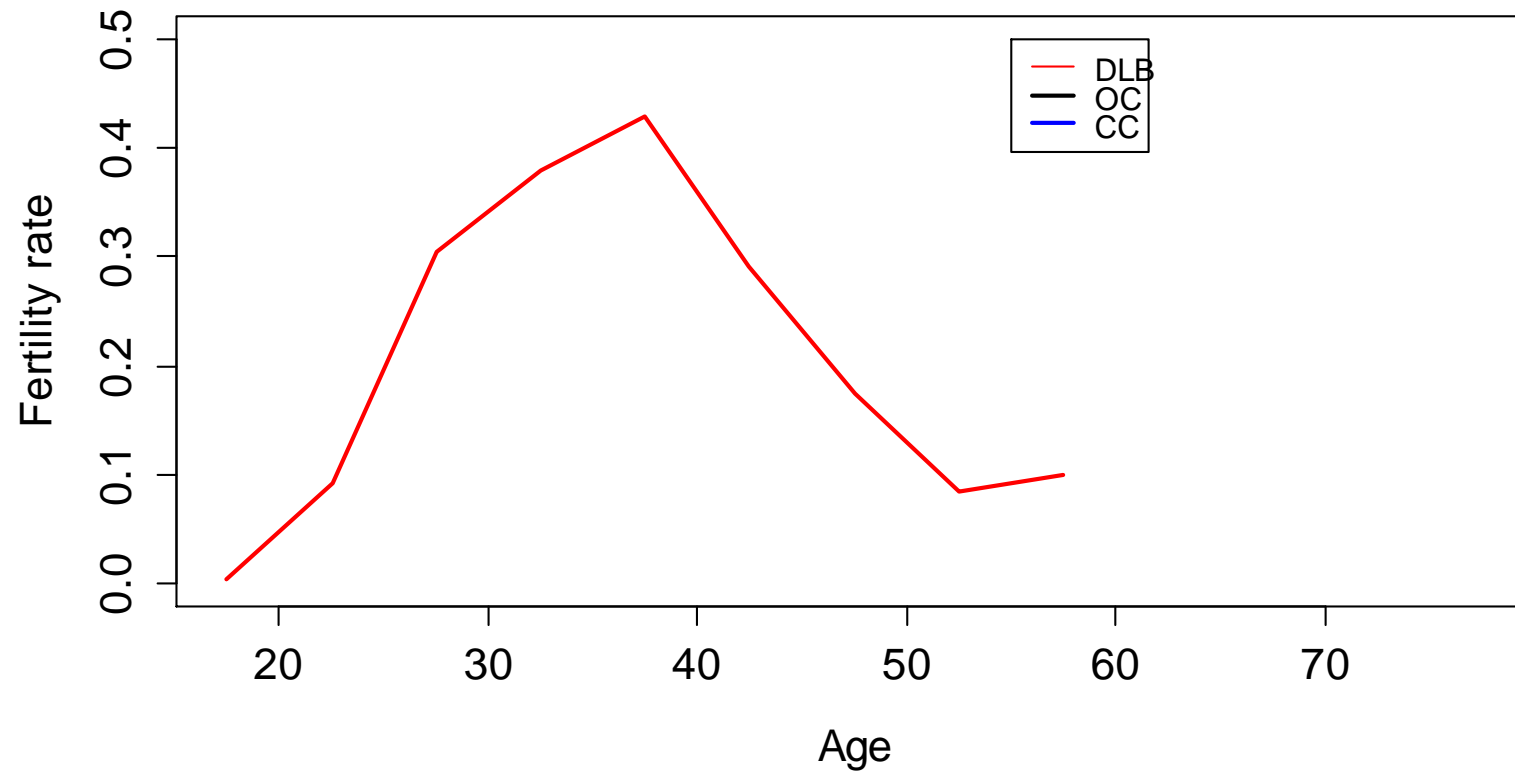
Date of last birth

Schmertmann (1999)



$$\lambda_i = \frac{\text{number of visible births in age group } j}{\text{visible exposure in age group } j}$$

Rwanda 2000-2005

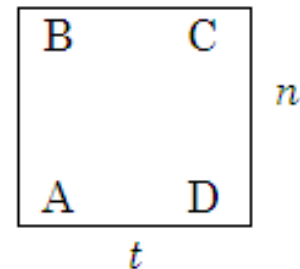


CRISSCROSS METHOD (CHILDREN EVER BORN)

Crisscross

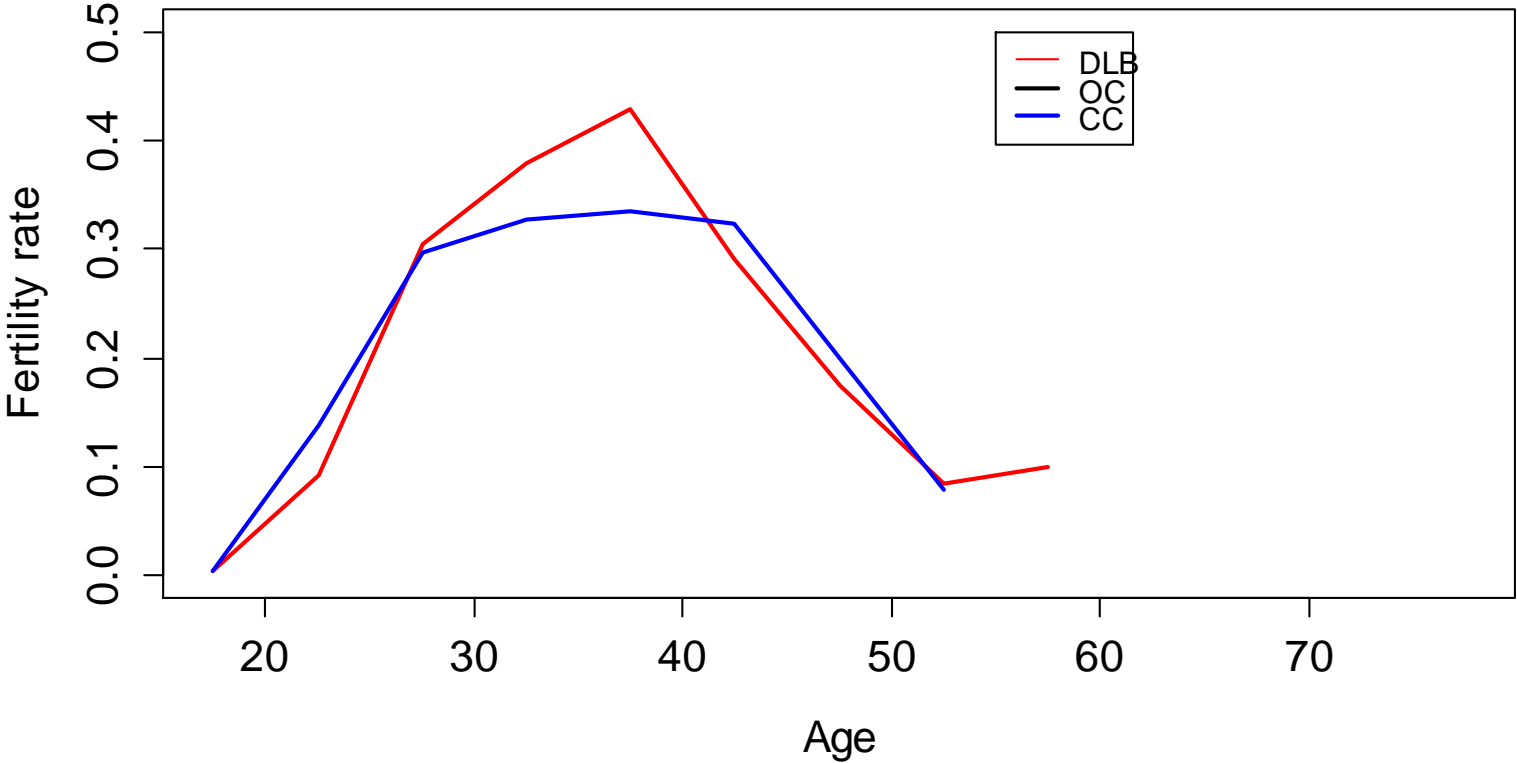
Schmertmann (2002)

Figure 1 : Illustration of Lexis diagram and formula for estimating fertility rates with the crisscross approach (adapted from [Schmertmann, 2002](#)).



$$\lambda = \left(\frac{1}{2n} + \frac{1}{2t}\right) \cdot (C - A) + \left(\frac{1}{2n} - \frac{1}{2t}\right) \cdot (B - D) \quad \text{(Eq. 1)}$$

Rwanda 2000-2005



OWN CHILDREN METHOD (HOUSEHOLD DATA)

Surviving children and fathers (household survey)

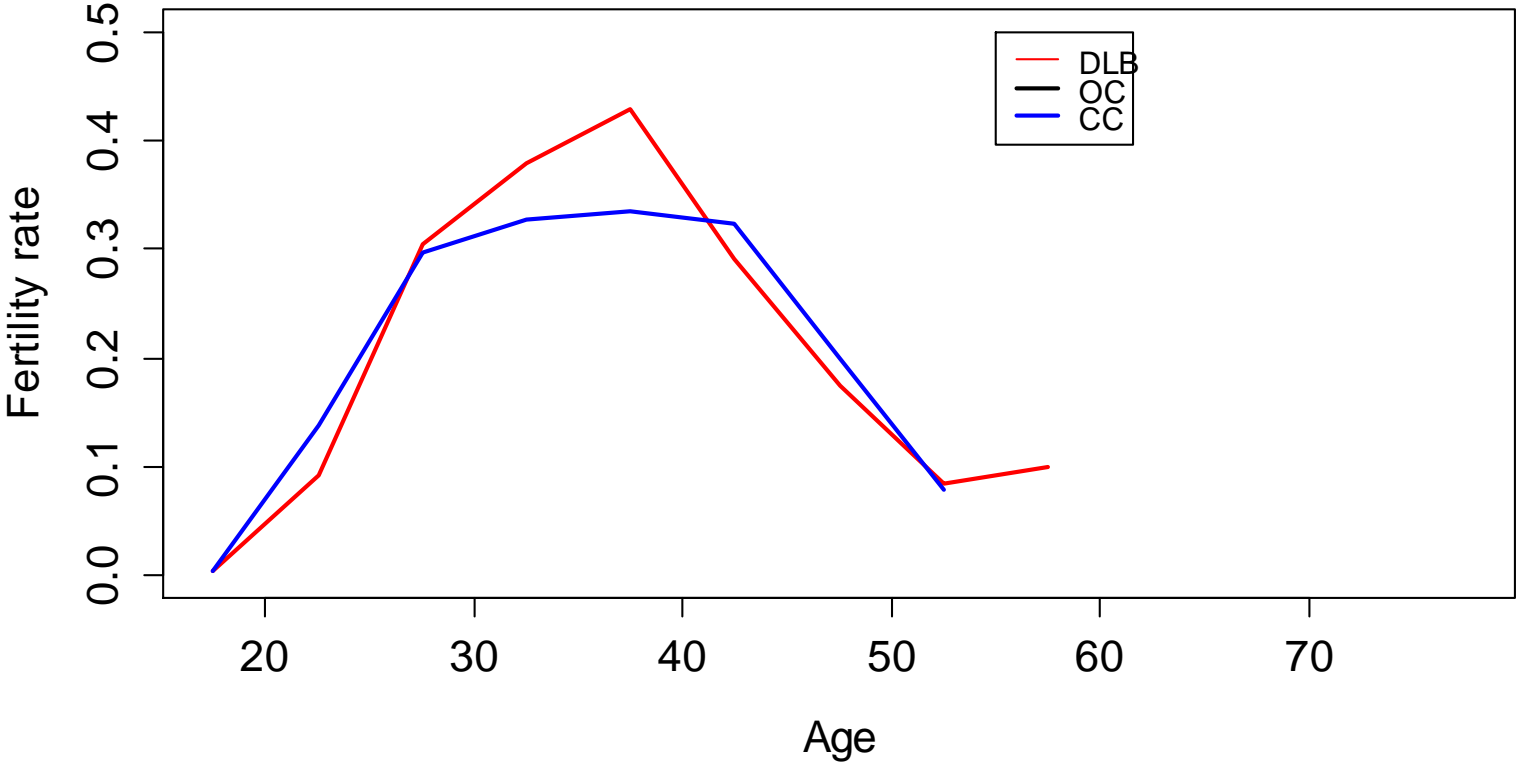
LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD*	RESIDENCE		SEX	AGE**
(1)	(2)	(3)	Does (NAME) usually live here?	Did (NAME) stay here last night?	Is (NAME) male or female?	How old is (NAME)?
			YES NO	YES NO	M F	IN YEARS
01		<input type="text"/>	1 2	1 2	1 2	<input type="text"/>
02		<input type="text"/>	1 2	1 2	1 2	<input type="text"/>
03		<input type="text"/>	1 2	1 2	1 2	<input type="text"/>

PARENTAL SURVIVORSHIP AND RESIDENCE OF PERSONS LESS THAN 15 YEARS OLD			
Is (NAME)'s biological mother alive?	IF ALIVE: Does (NAME)'s biological mother live in this household? 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 household? IF YES: What is his name? RECORD FATHER'S LINE NUMBER. IF NOT LIVING IN HOUSEHOLD WRITE '00'.
(20)	(21)	(22)	(23)
YES NO DK		YES NO DK	
1 2 8	<input type="text"/>	1 2 8	<input type="text"/>
1 2 8	<input type="text"/>	1 2 8	<input type="text"/>
1 2 8	<input type="text"/>	1 2 8	<input type="text"/>

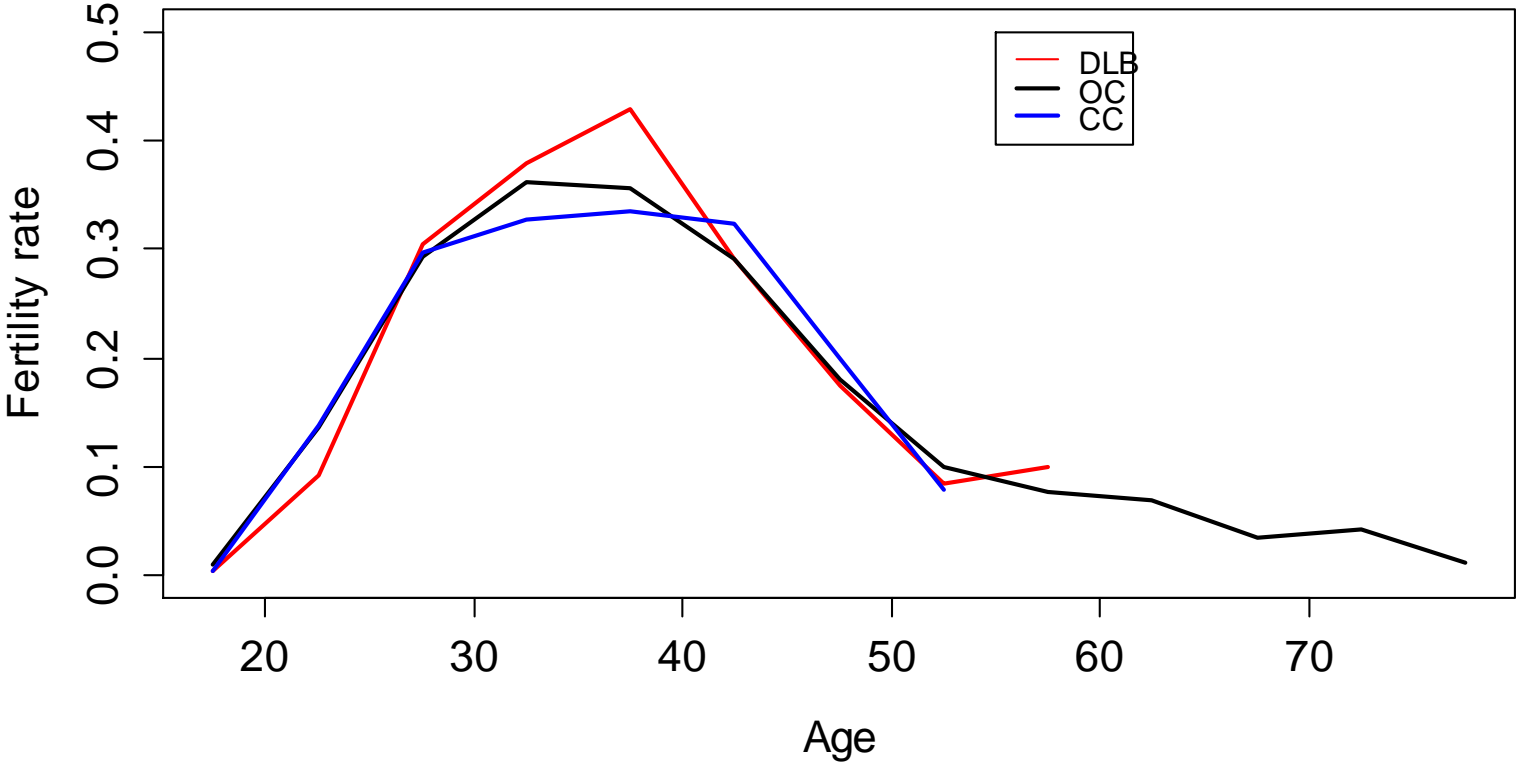
Own children method

- Drop children whose father is deceased
- Match children with fathers
- Link unmatched children to potential fathers
 - Imputation of age of father among unmatched children
 - Link to a male of the same age as the imputed age of father
- Reverse survive children
 - Using survival probabilities from female birth histories
- Age specific fertility rates
 - 5-year age groups
 - TFRs (15-79)
 - Fertility trends for 15 years preceding each survey

Rwanda 2000-2005



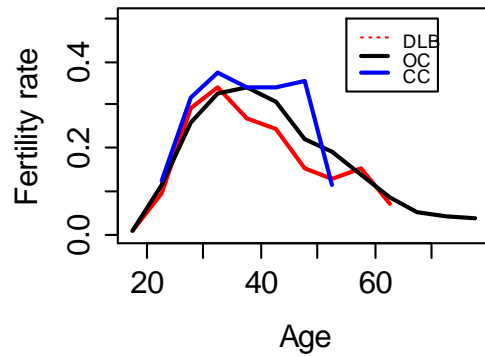
Rwanda 2000-2005



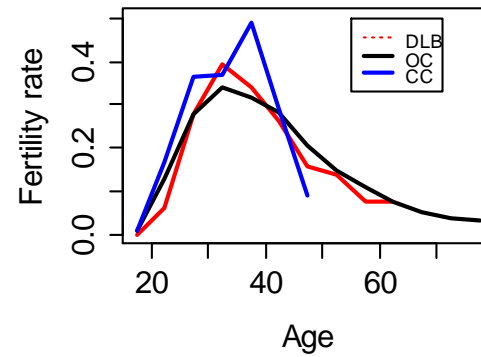
COMPARISON OF METHODS

Three methods

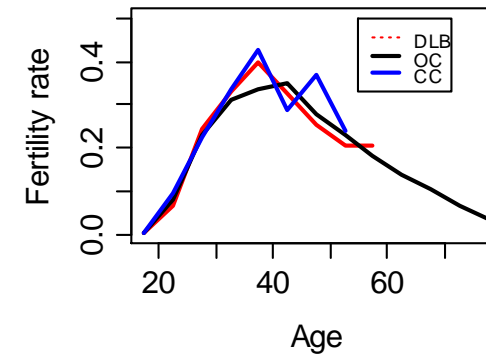
Benin 1996-2001



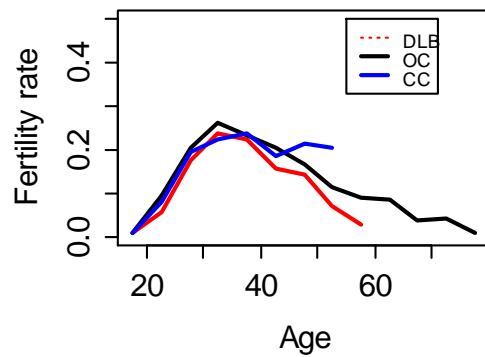
Benin 2001-2006



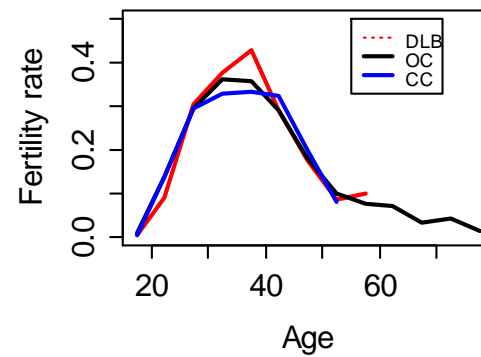
Burkina Faso 1998-2003



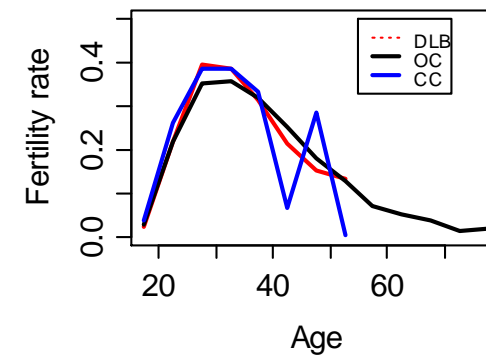
Ghana 1993-1998



Rwanda 2000-2005

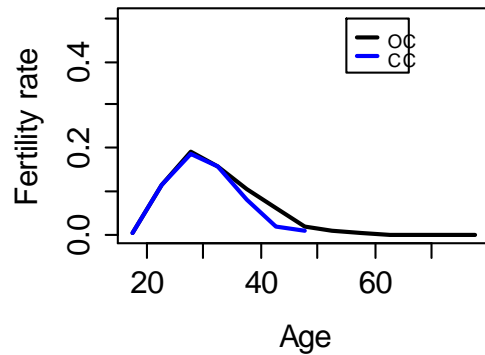


Uganda 1996-2001

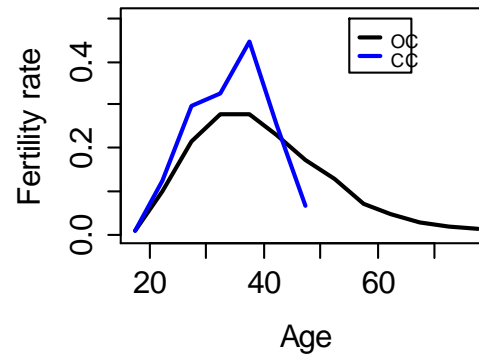


Own children and Crisscross

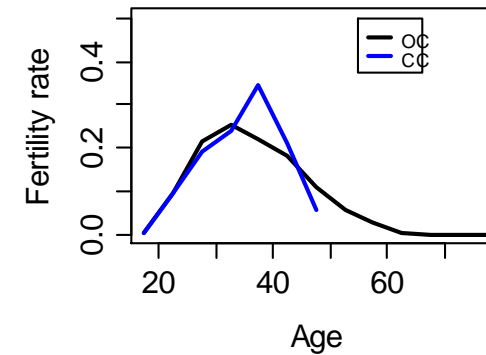
Cambodia 2005-2010



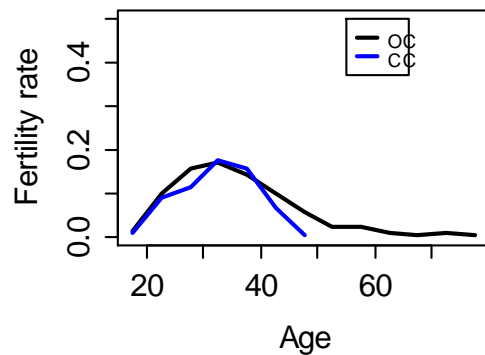
Ethiopia 2000-2005



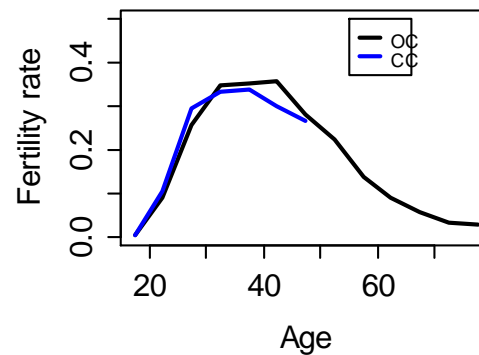
Haiti 2000-2005



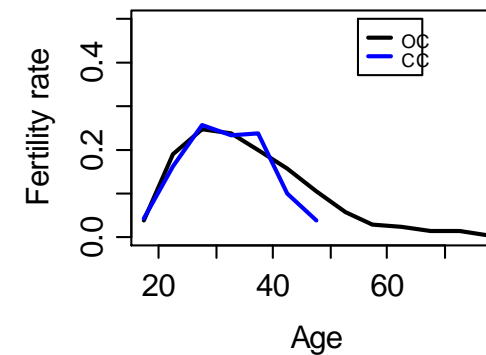
Lesotho 2004-2009



Mali 2001-2006

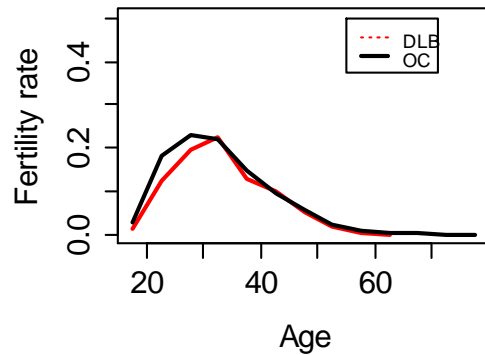


Madagascar 2003-2008

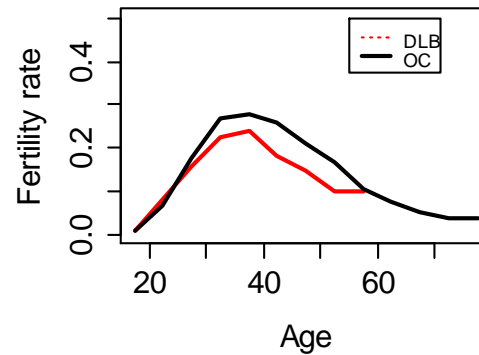


Own children and date of last birth

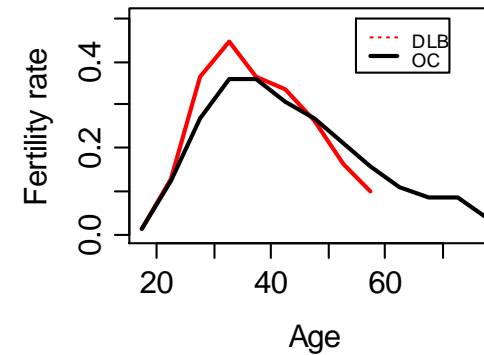
Bolivia 1993-1998



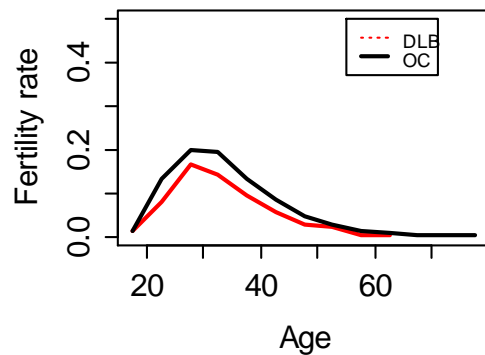
Cameroon 1993-1998



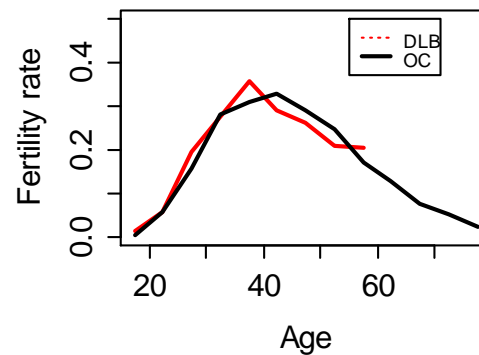
Chad 1991-1996



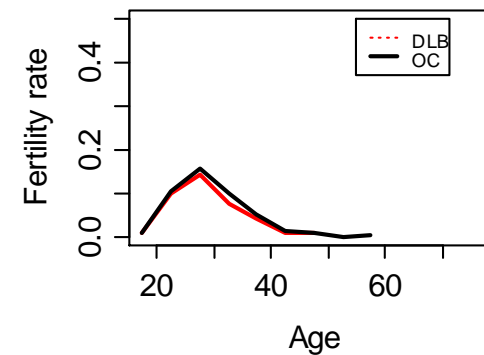
Dominican Republic 1991-1996



Guinea 1994-1999

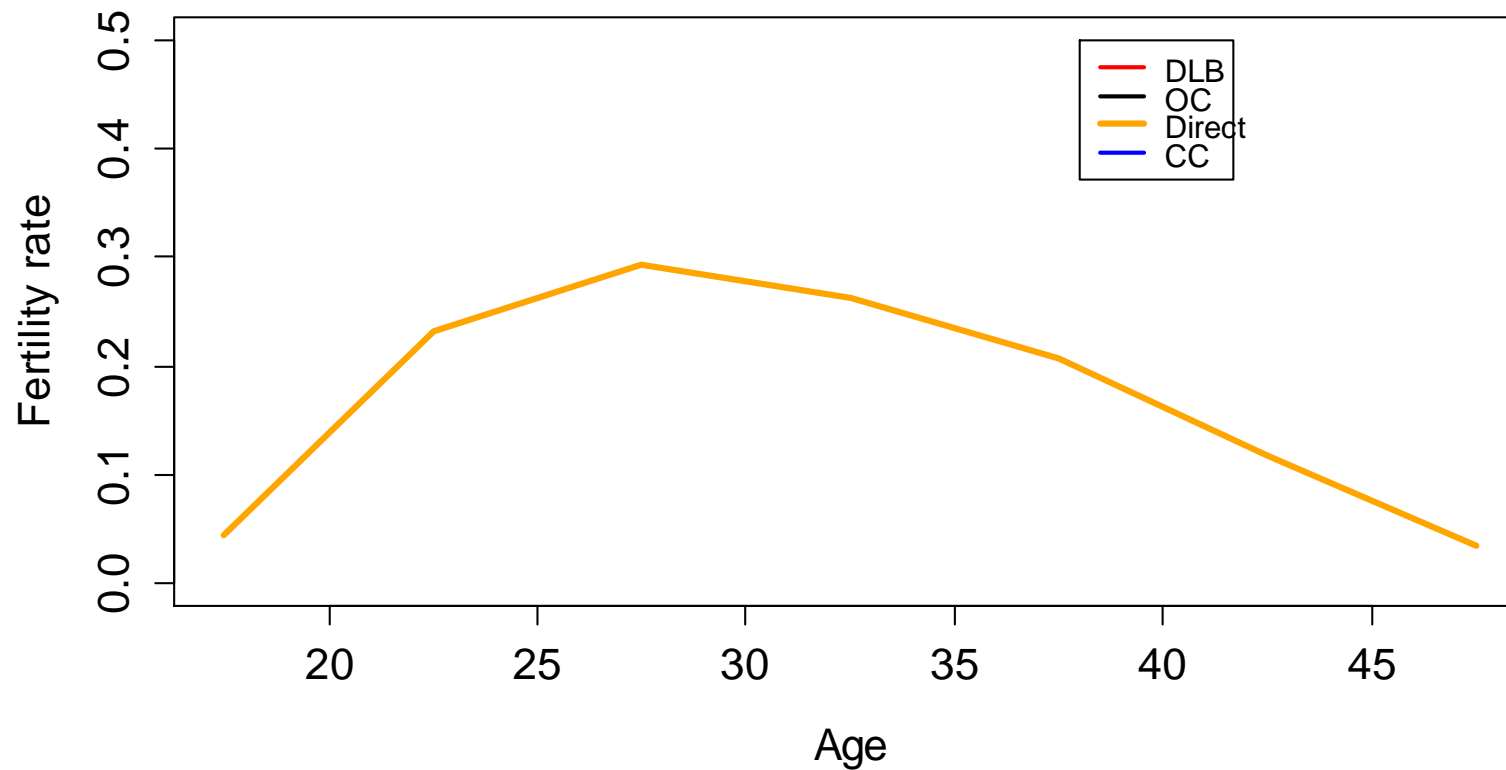


Kazakhstan 1994-1999



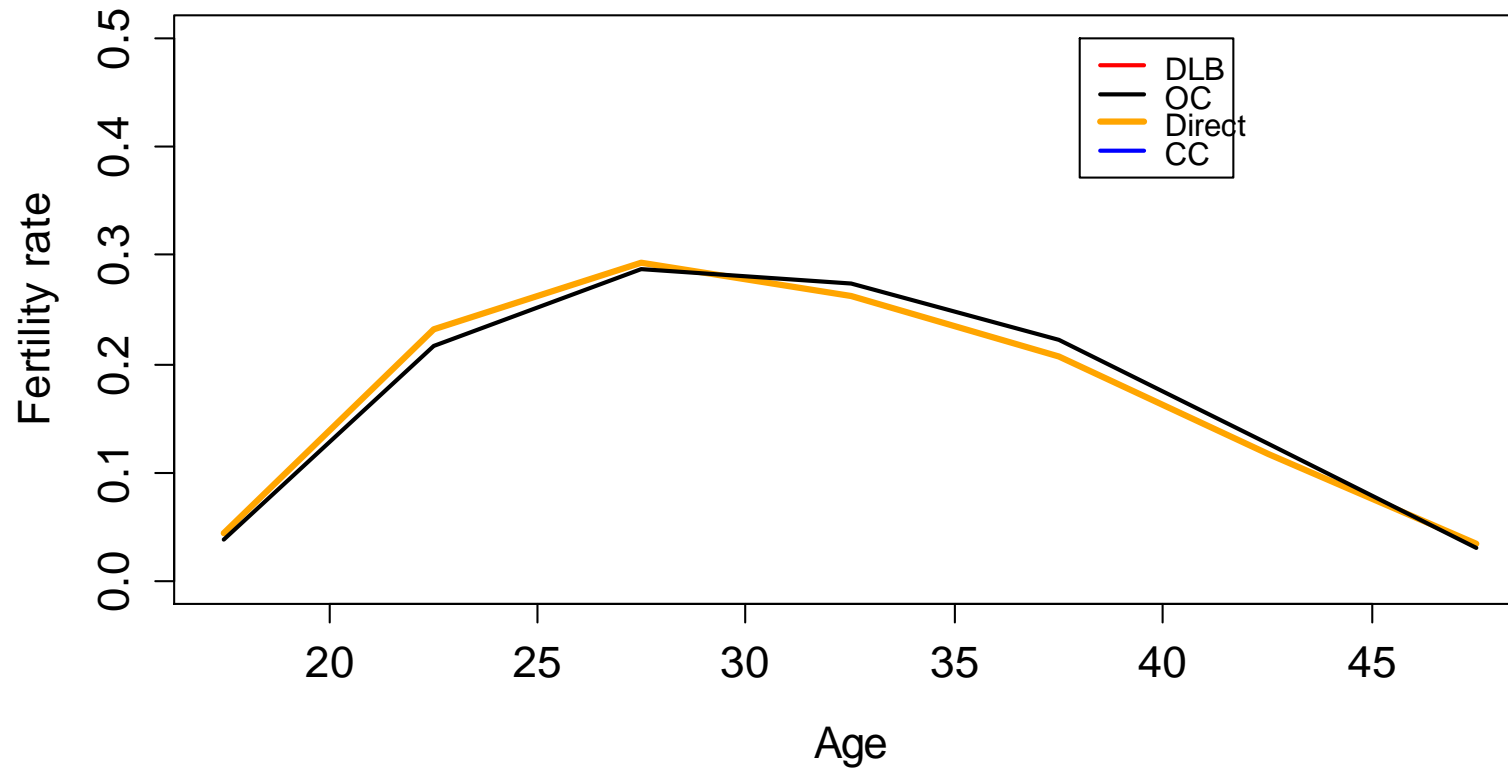
Comparisons among females

Rwanda 2000-2005



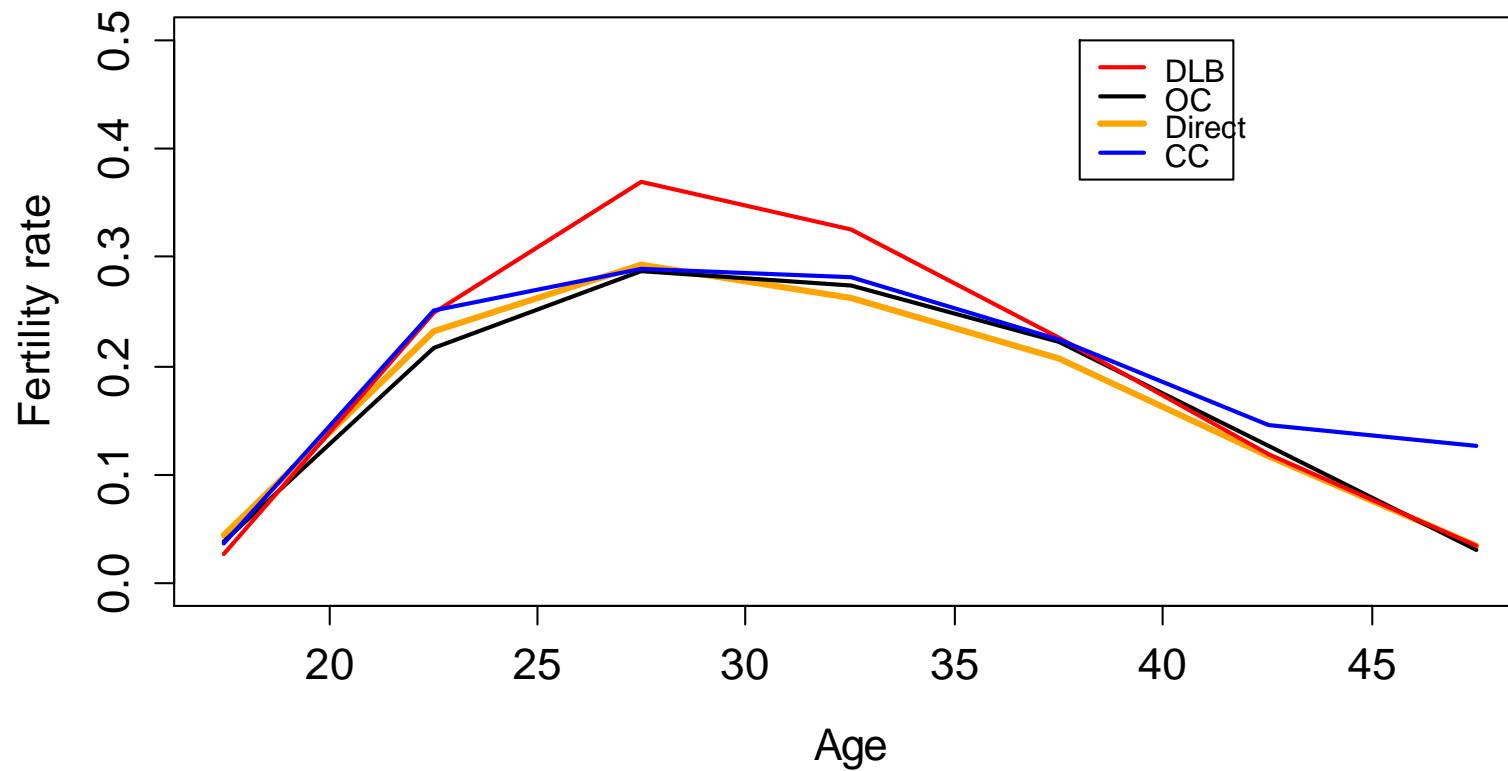
Comparisons among females

Rwanda 2000-2005



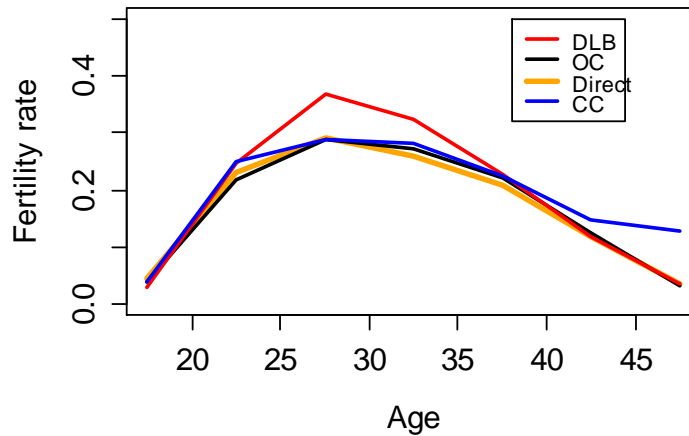
Comparisons among females

Rwanda 2000-2005

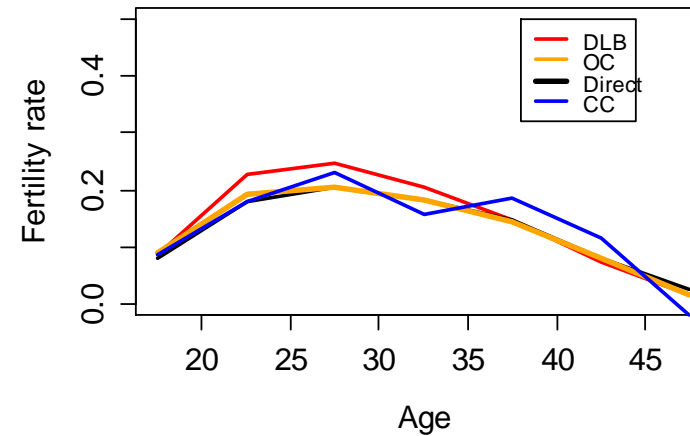


Comparisons among females

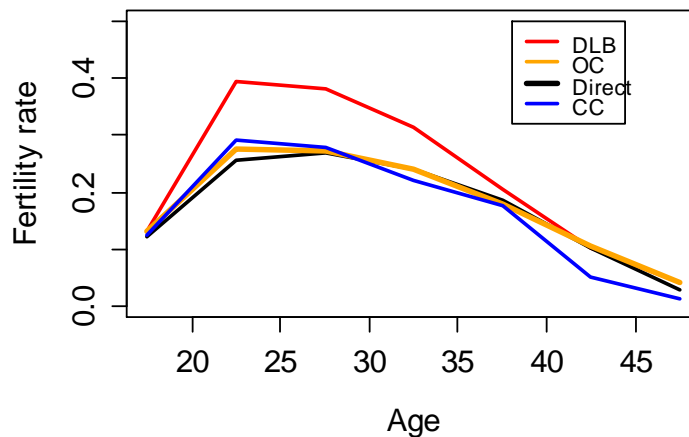
Rwanda 2000-2005



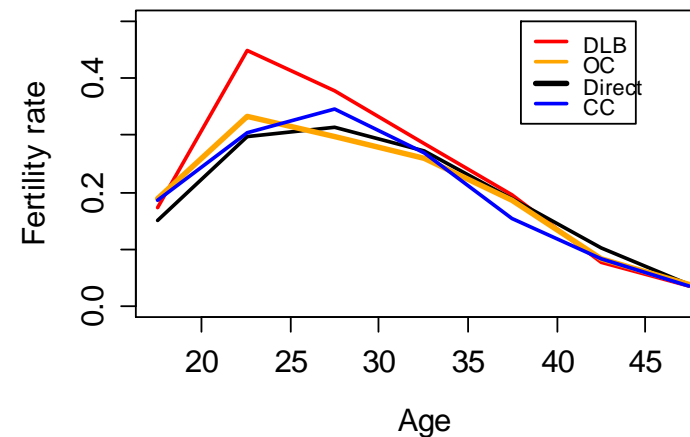
Ghana 1993-1998



Burkina Faso 1998-2003



Uganda 1996-2001



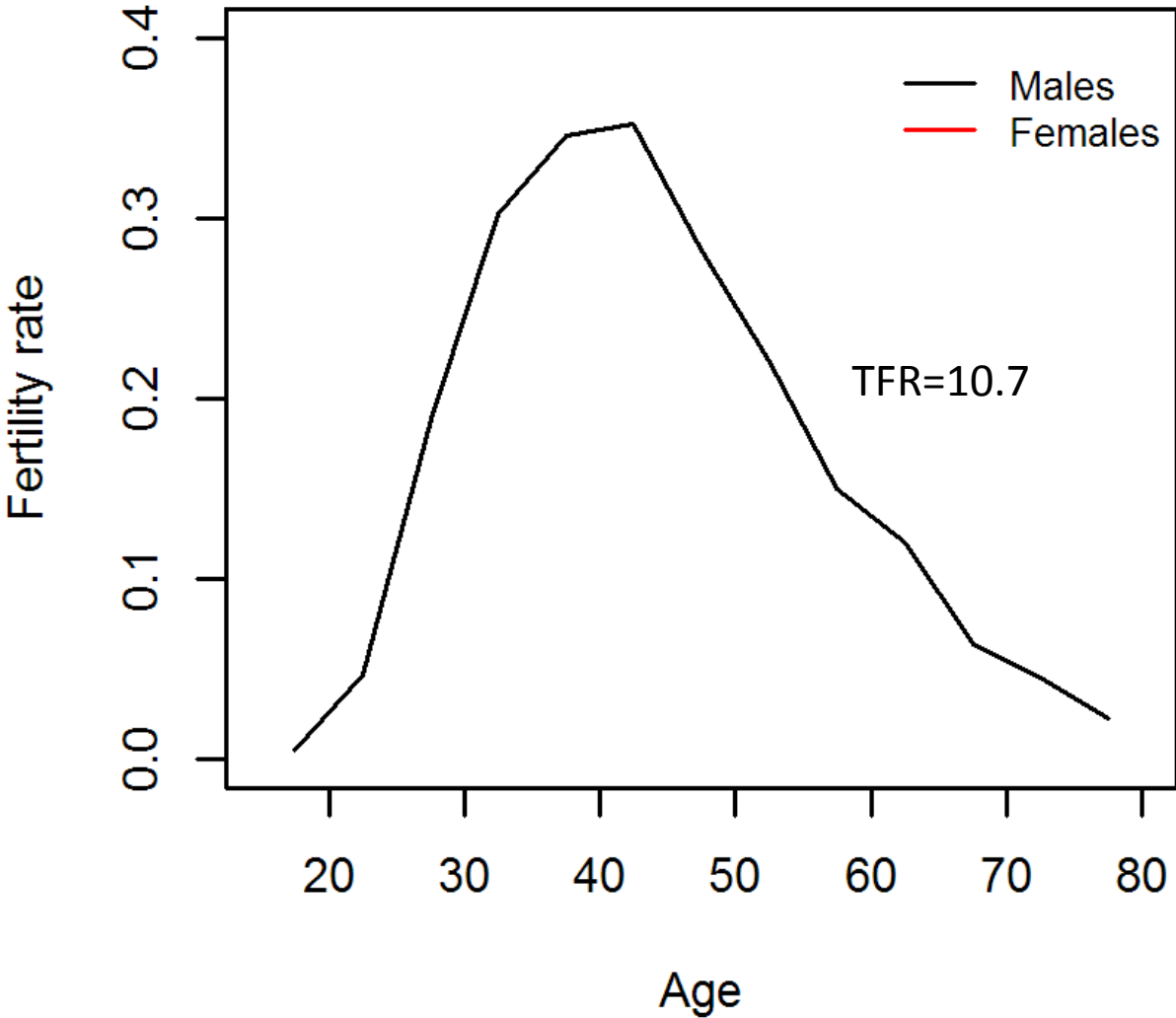
Strengths and limitations of the male own children method

- Strengths
 - Most regular and plausible curves
 - Full age range (15-79)
 - Possible with virtually all DHS surveys
 - May be adapted to census data
 - Possible to reconstruct trends
 - Does not rely on fathers' reporting of children
 - Validated among females with direct methods
- Limitations
 - Possibly affected by migration of fathers
 - Assumptions needed to analyze fertility differentials

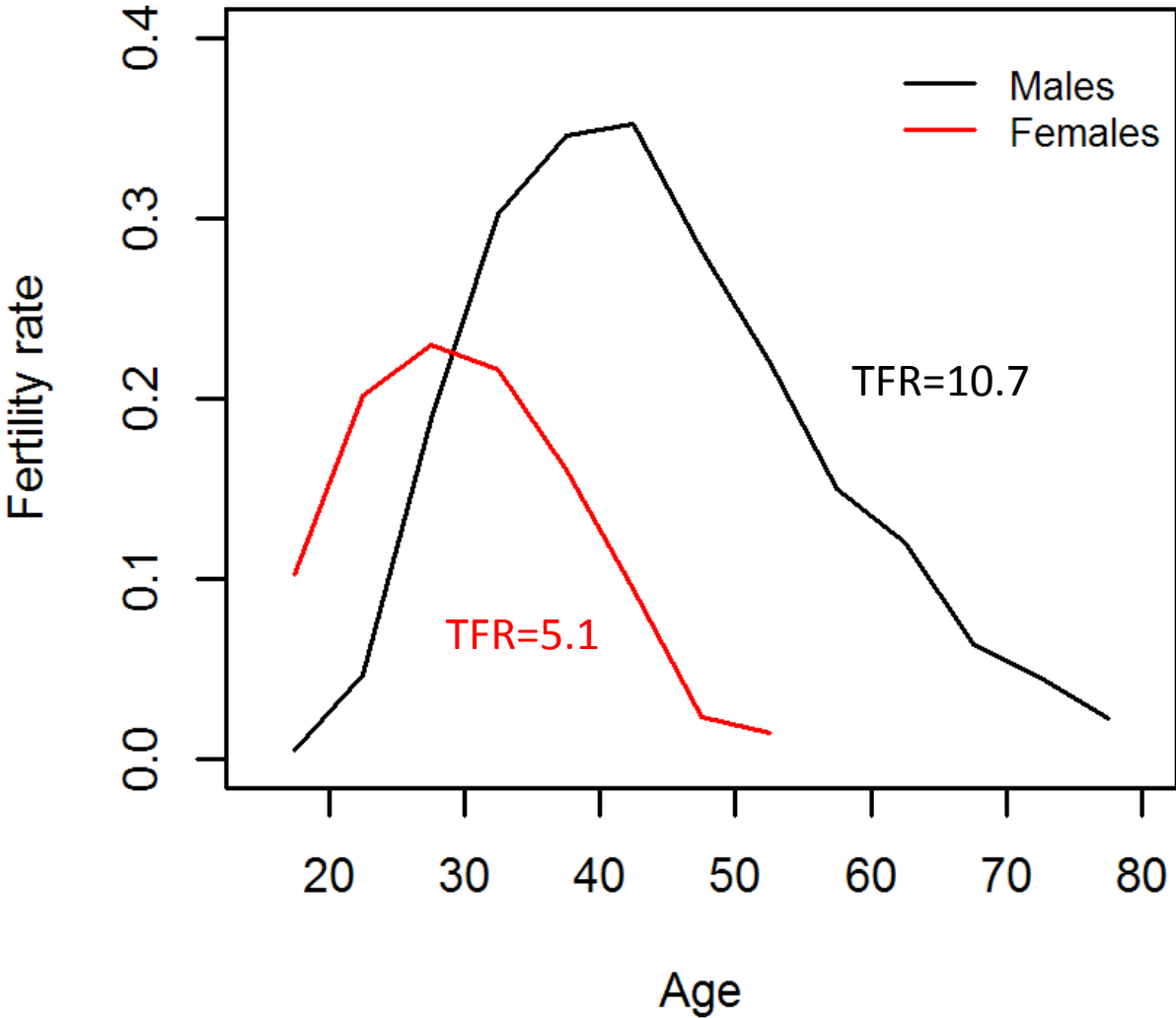
Male and female fertility compared

Age-specific fertility rates

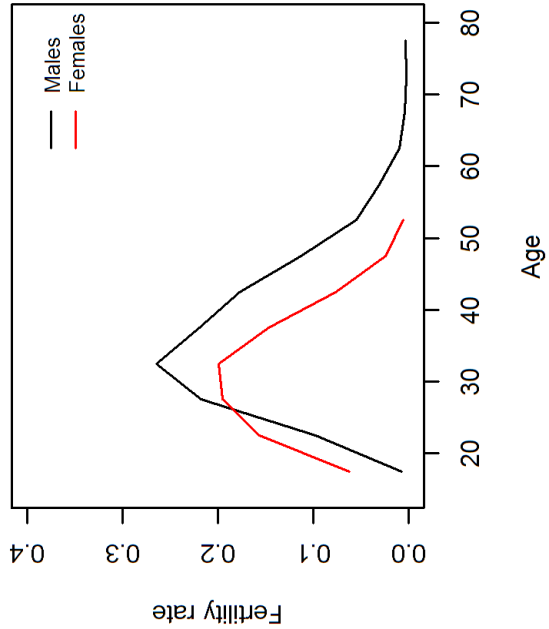
Senegal 2014



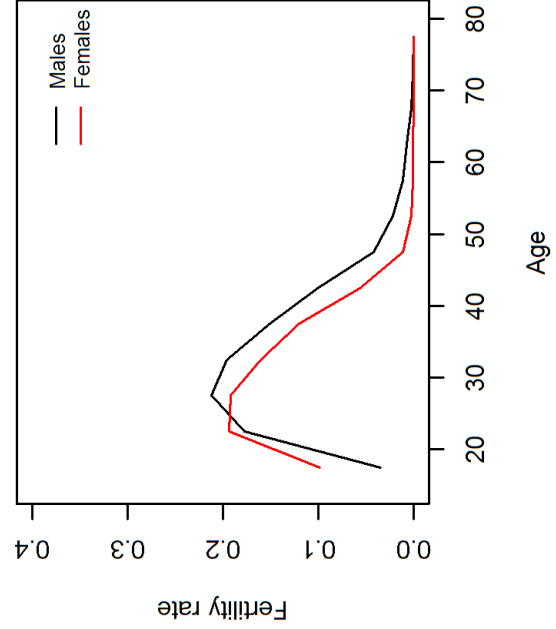
Senegal 2014



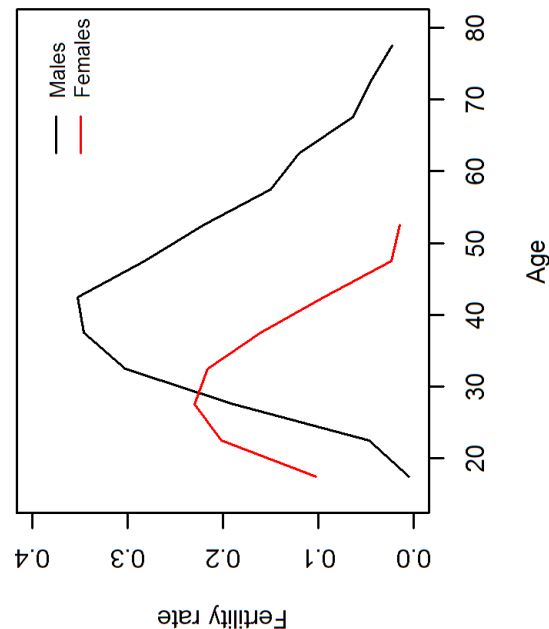
Haiti 2010



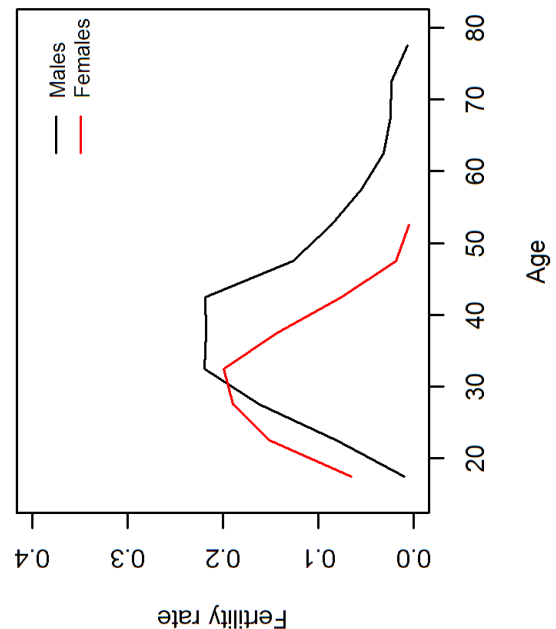
Bolivia 2003



Senegal 2014



Cambodia 2010

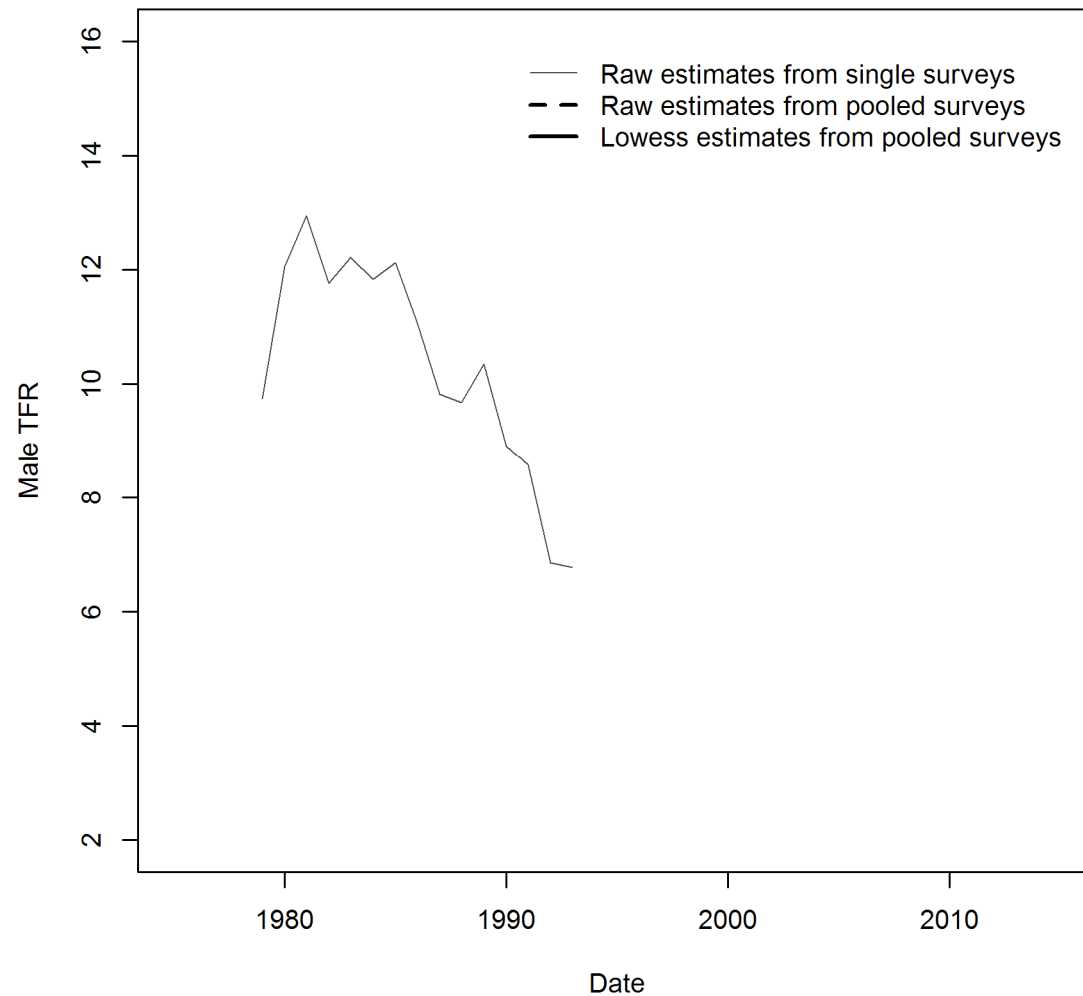


Male and female fertility compared

Fertility transitions

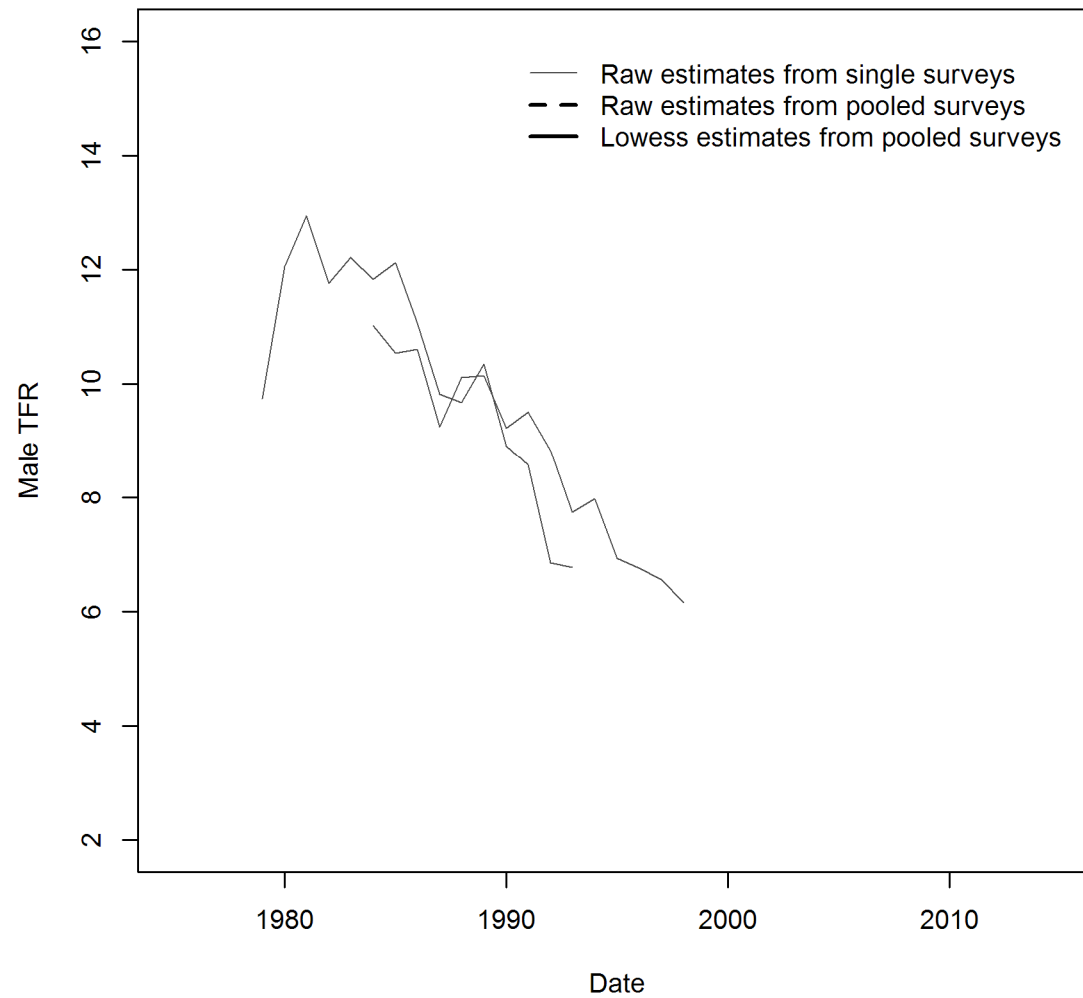
Reconstruction of Male TFRs

Zimbabwe



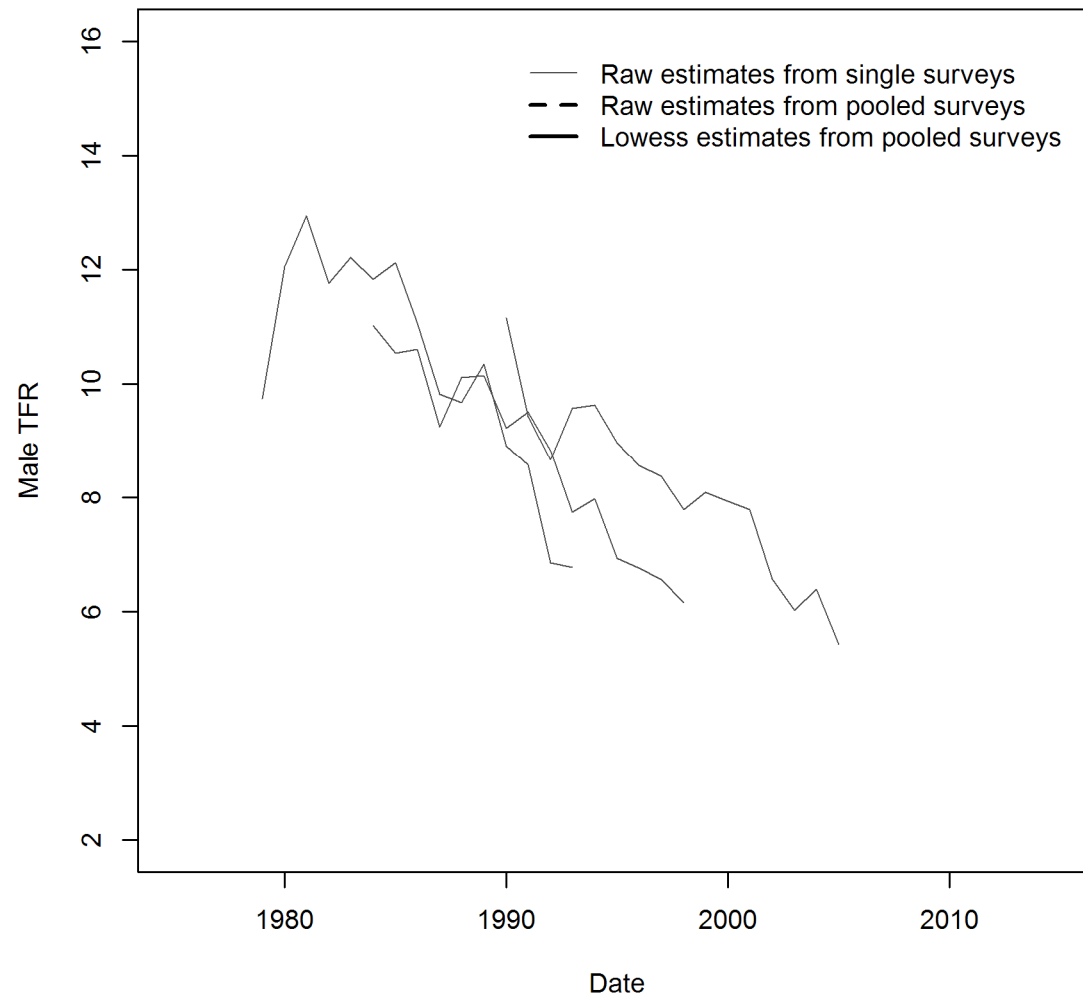
Reconstruction of Male TFRs

Zimbabwe



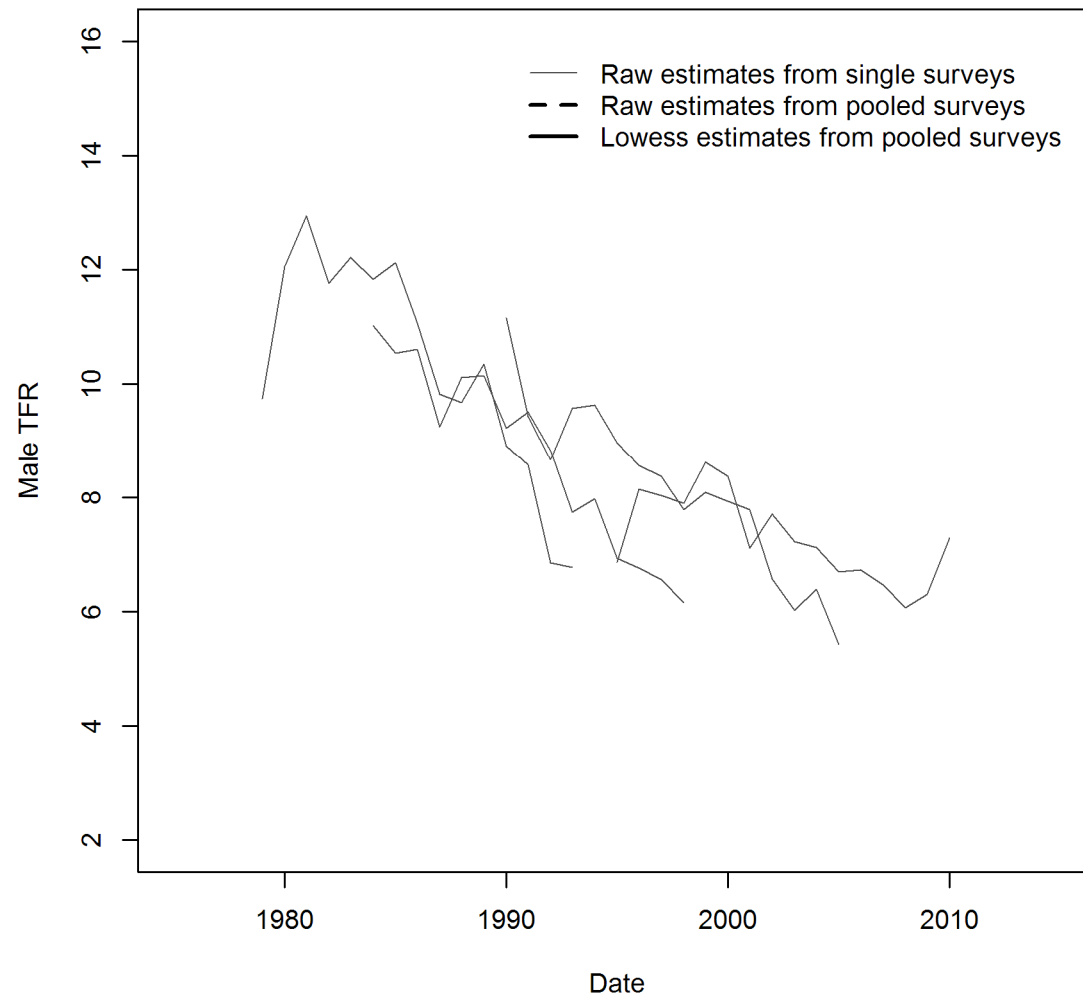
Reconstruction of Male TFRs

Zimbabwe

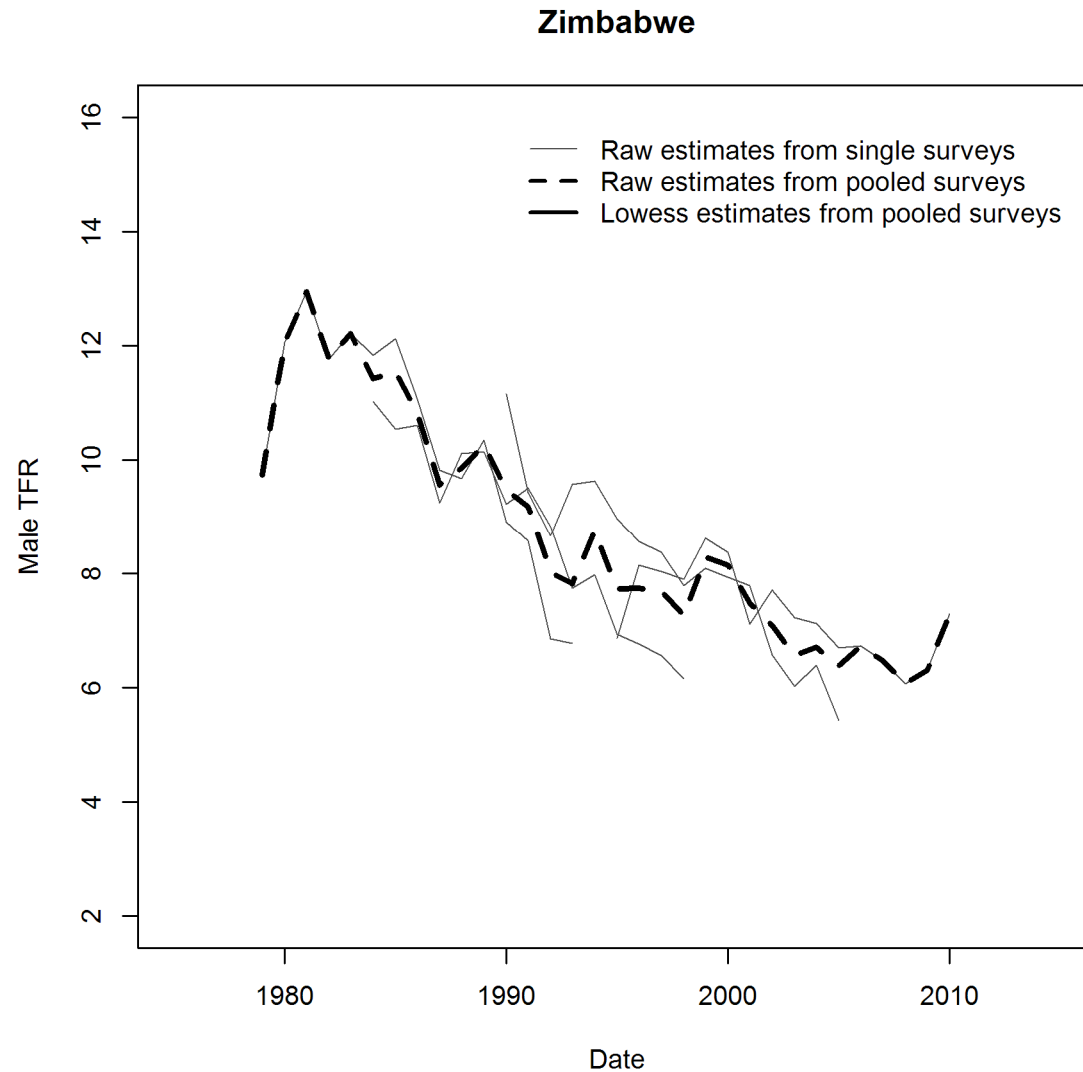


Reconstruction of Male TFRs

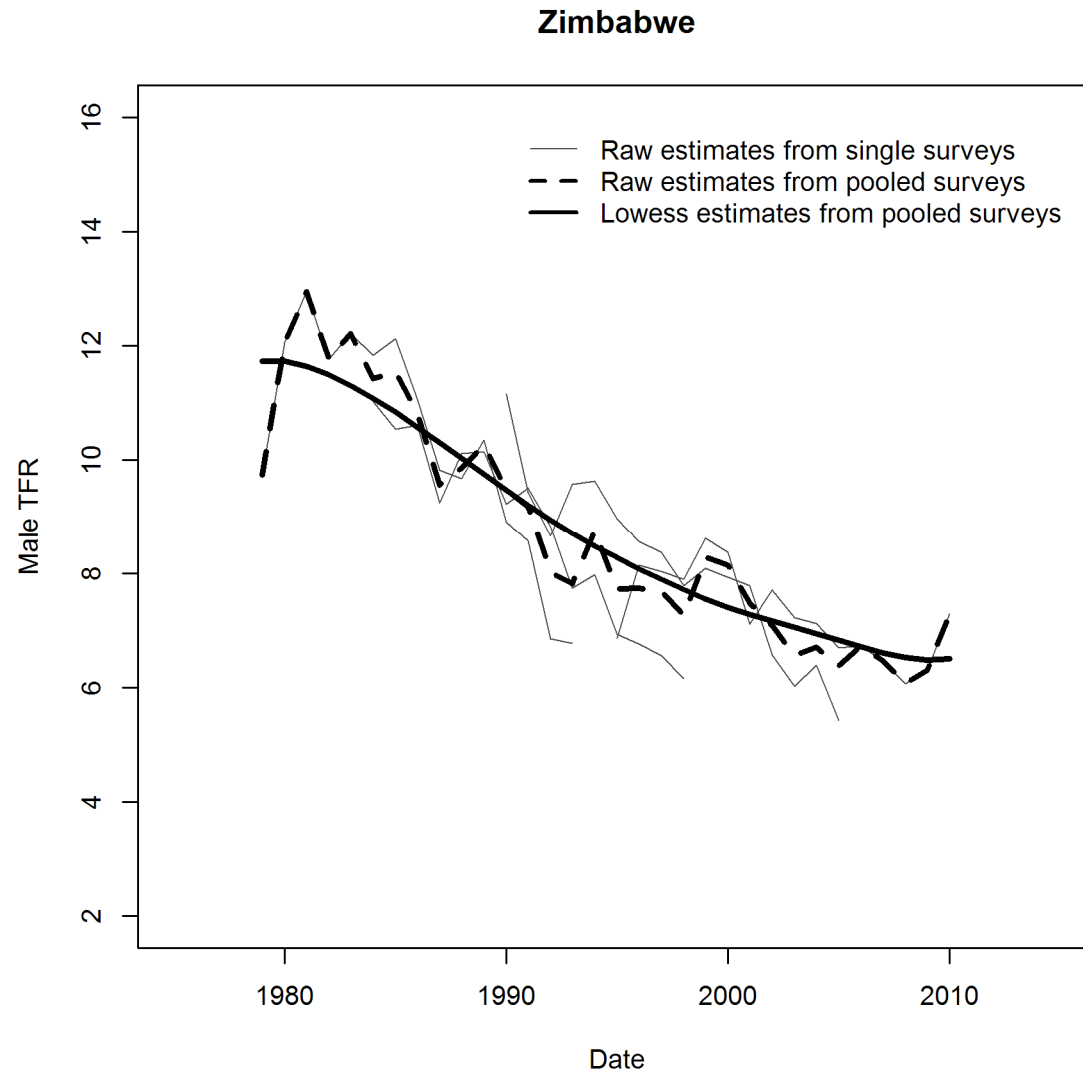
Zimbabwe



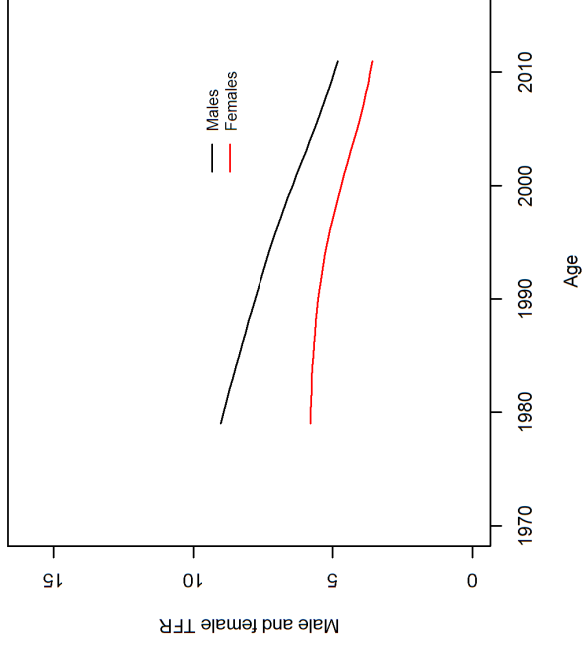
Reconstruction of Male TFRs



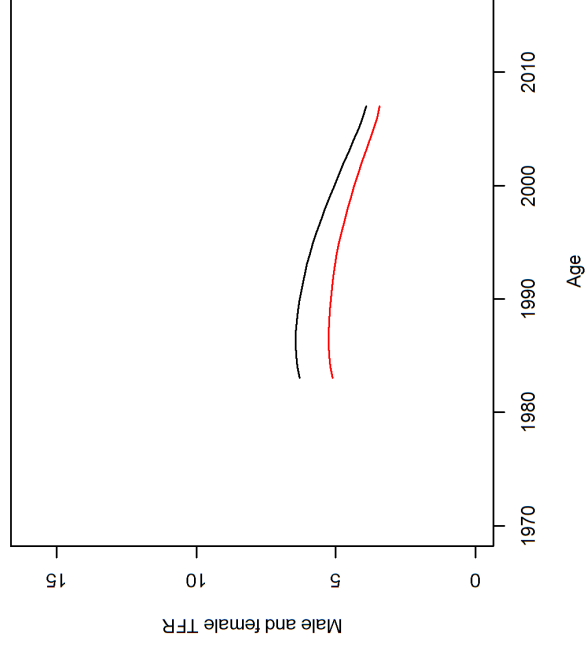
Reconstruction of Male TFRs



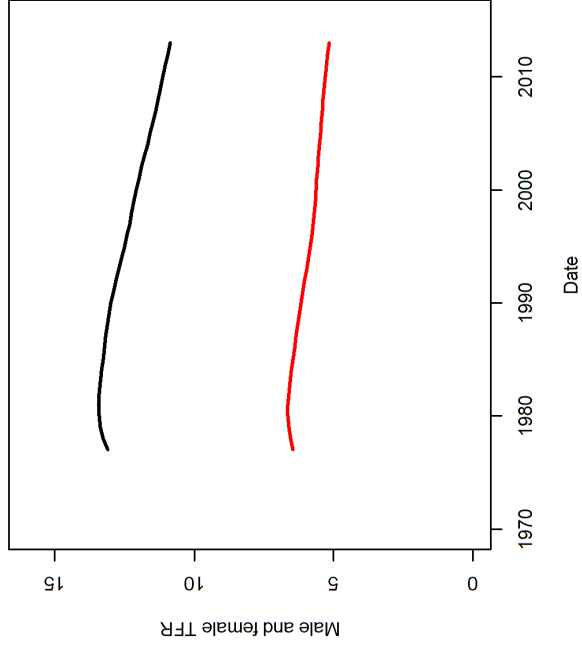
Haiti



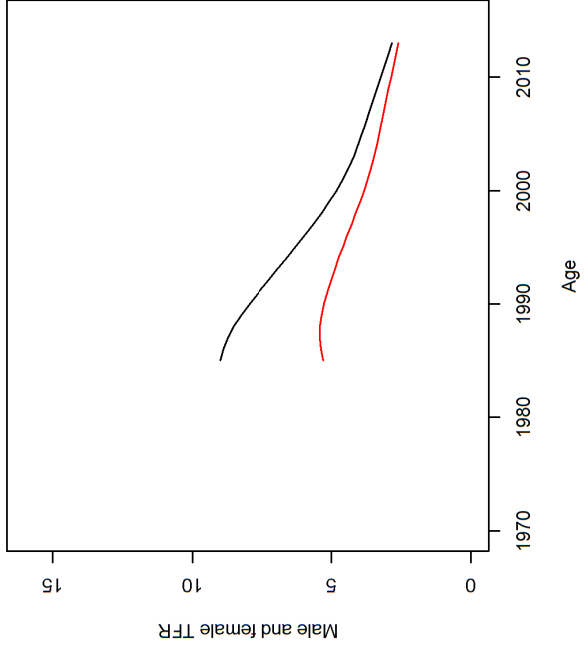
Bolivia



Senegal



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
 - Male TFR \gg Female TFR
 - Very different fertility experiences
- Convergence between male and female TFR with fertility transition
- First step – further research
 - Determinants, theories
 - Refinement of methods, reconstructing birth histories -> micro analyses, parity progression, etc.