Stalls in Fertility Transitions in Sub-Saharan Africa

Revisiting the evidence

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Fertility stalls in Sub-Saharan Africa

(Bongaarts,2006, 2008 ; Ezeh et al., 2011 ; Garenne, 2008, 2011 ; Goujon et al., 2016 ; Kebede et al., 2019 ; Machiyama, 2011 ; Shapiro et al., 2008)

- Fertility stalls in a number of countries
  - Ghana, Kenya and Nigeria in the late 1990s
  - Cameroon, Mozambique, Rwanda, etc.
- Important theoretical and policy issue
  - Large impact on future population size
  - Role of family planning programs
  - African exceptionalism
- No consensus on the countries with stalls
  - Number of countries ranges from 1 to 12
  - As many as 20 countries with stalls in SSA
  - Few countries consistently in the lists (e.g. Kenya)

Causes of fertility stalls in SSA

(Bongaarts, 2008 ; Ezeh et al., 2011 ; Goujon et al., 2016 ; Kebede et al., 2019 ; Shapiro et al., 2008 ; Westoff and Cross, 2006)

- Contraceptive use
  - Stall in Kenya, shortages of supply
  - Mixed evidence in cross-country comparisons
- Fertility preferences
  - Stalls in fertility preferences in Kenya
  - Mixed evidence in cross-country comparisons
- Socioeconomic determinants
  - Mixed effects of economic changes and child mortality
  - Possible stalls in education
- Mixed evidence may be related to measurement errors
  - Issues with explanatory variables
  - Spurious stalls

Objective : revisiting the evidence

- How many stalls, where, when ?
  - Definitions matter
  - Data and methods matter
- Identification of 'confirmed cases'
  - Stalls strongly supported by the data
  - Cases for further research
- Consistency across data sources and methods
  - DHS, censuses, MICS
  - Variety of methods

Data and methods

- Demographic and Health Surveys
  - 32 countries with at least 2 surveys, 125 standard DHS
  - Birth histories, proximate determinants
  - Published fertility rates, reconstructed trends from pooled birth histories, fertility trends from proximate determinants
- MICS and other surveys (AIS, MIS, Special DHS)
  - 13 MICS (11 countries) and 34 other surveys (18 countries)
  - Full birth histories, births in last 3 years, births in last 12 months
- Census data
  - 32 countries, 86 censuses
  - Data from census reports, UN World Fertility Data, UN Statistics Division, IPUMS
  - Age distribution of children and women (reverse-survival method) and births in last 12 months (direct estimates)

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Defining and identifying stalls

Comparisons of 93 pairs of surveys

An ***ongoing fertility transition*** interrupted by a period of ***no significant change*** before the end of the transition (Bongaarts, 2008)

- Ongoing transition
  - Published TFR at least 10% lower than the completed fertility (40-49) in previous surveys and contraceptive prevalence among married women 10% or over
    - Conservative approach : TFR<5
- No significant change
  - difference between published TFRs in two successive surveys is not statistically significant (p>=0.10)
    - Conservative approach : TFR constant or increasing

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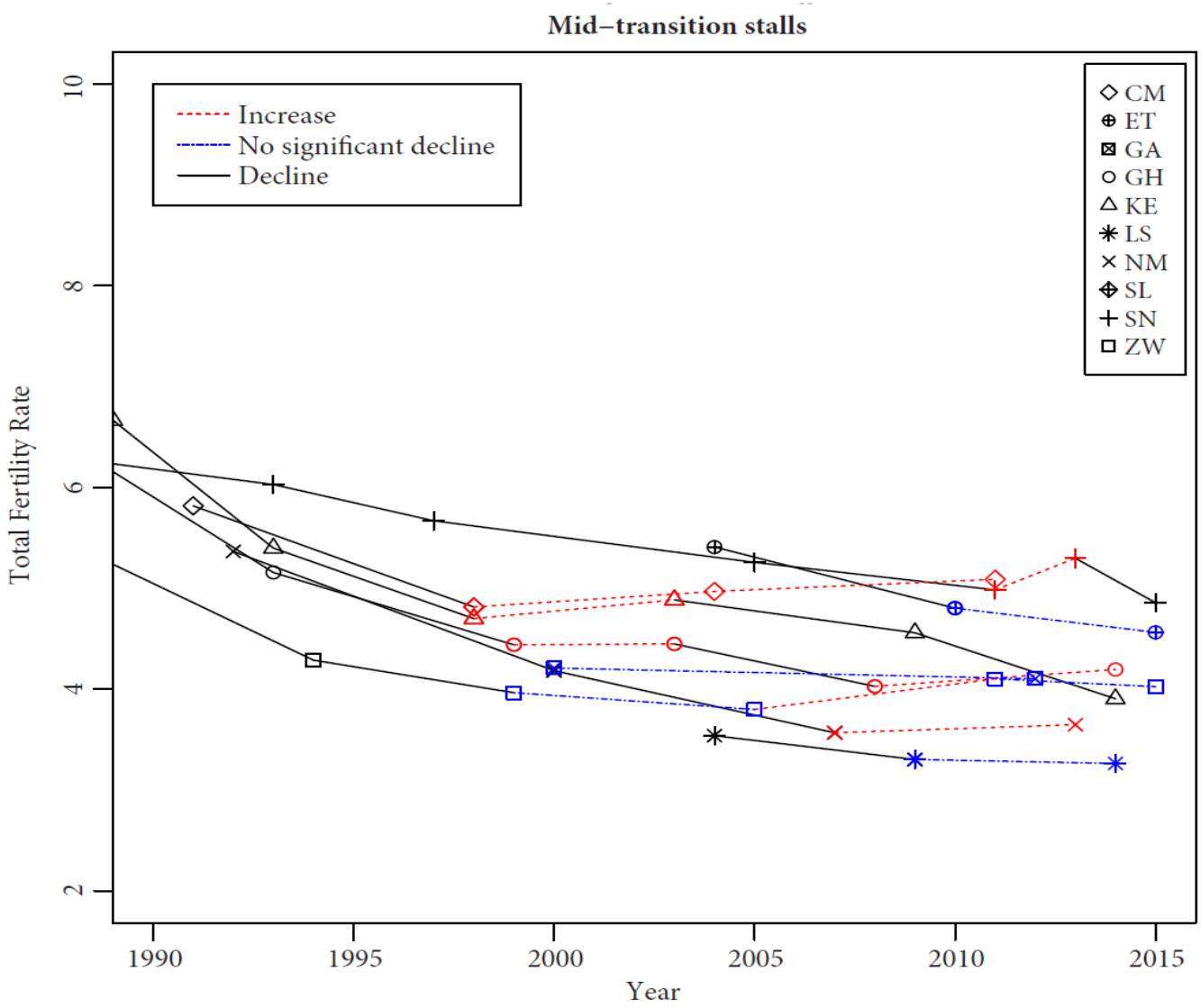
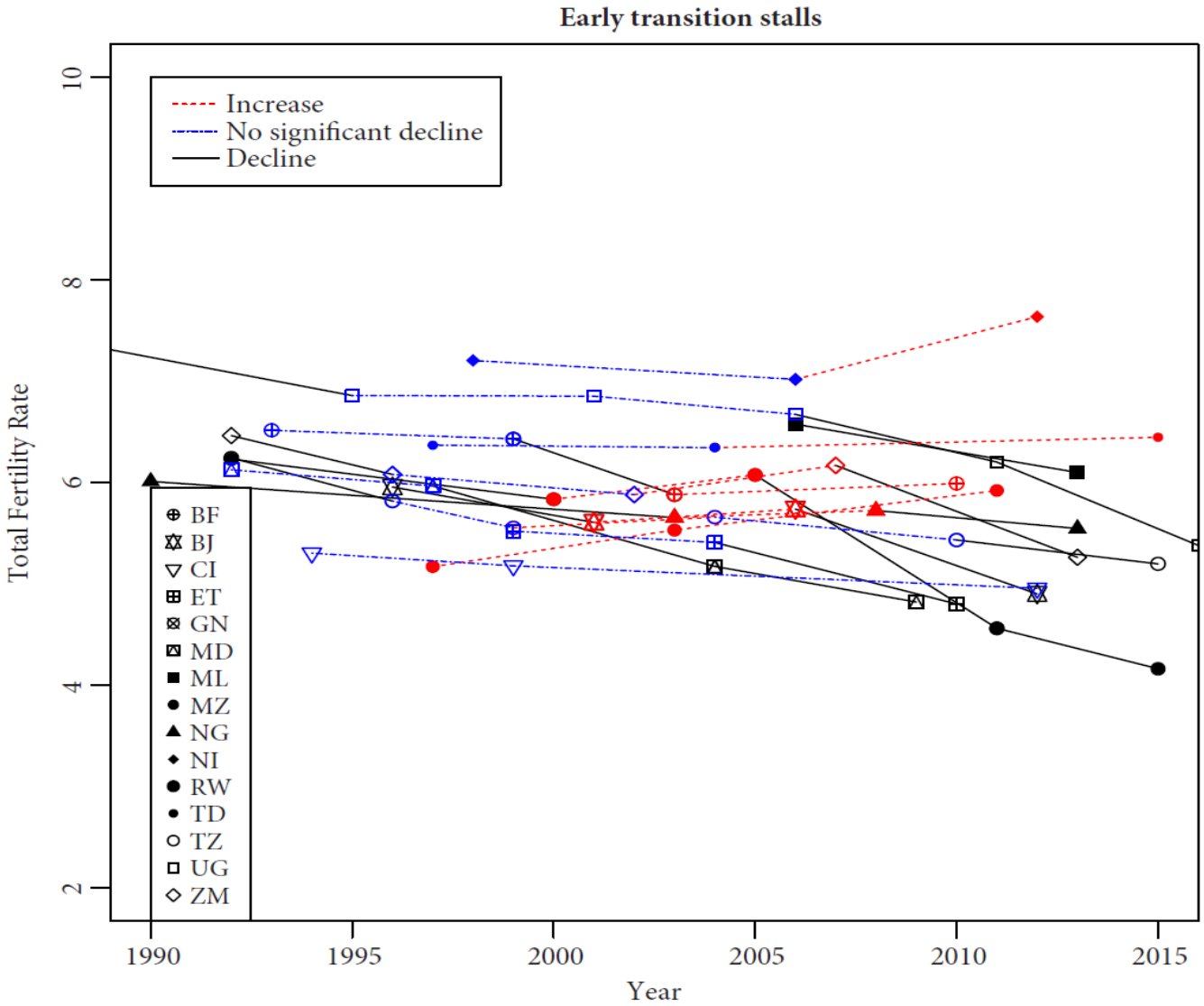
14 mid-transition stalls, 10 countries

Conservative approach : 9 mid-transition stalls, 7 countries



23 early transition stalls, 14 countries

Conservative approach : 10 early transition stalls, 9 countries



37 stalls, 23 countries

TABLE 2 Classification of fertility changes, 32 countries, 93 cases (pairs of surveys)

Total Fertility Rate	No stall (significant decline or no decline in case of no transition) 56 cases, 25 countries	Slight stall (no significant decline) 18 cases, 13 countries	Stall (stagnation or increase in fertility) 19 cases, 16 countries
		37 cases, 23 countries	
No transition	7 cases, 4 countries DR Congo (2007–2013), Guinea (1999–2005, 2005–2012), Mali (1987–1996, 1996–2001, 2001–2006), Niger (1992–1998)		
		23 cases, 14 countries	
Early Transition	39 cases, 20 countries Benin (1996–2001, 2006–2012), Burkina Faso (1999–2003), Burundi (1987–2010, 2010–2017), Cameroon (1991–1998), Ethiopia (2005–2010), Ghana (1988–1993, 1993–1998), Kenya (1989–1993, 1993–1998), Liberia (1986–2007, 2007–2013), Madagascar (1997–2004, 2004–2009), Malawi (1992–2000, 2000–2004, 2004–2010, 2010–2015), Mali (2006–2013), Namibia (1992–2000), Nigeria (1990–2003, 2008–2013), Rwanda (1992–2000, 2008–2011), Senegal (1986–1993, 1993–1997, 1997–2005, 2005–2011), Tanzania (1992–1996, 2010–2015), Togo (1988–1998, 1998–2014), Uganda (1988–1995, 2006–2011, 2011–2016), Zambia (1992–1996, 2007–2013), Zimbabwe (1988–1994).	13 cases, 10 countries Burkina Faso (1993–1999), Chad (1997–2004), Cote d'Ivoire (1994–1999, 1999–2012), Ethiopia (2000–2005), Madagascar (1992–1997), Niger (1998–2006), Sierra Leone (2008–2013), Tanzania (1996–1999, 2004–2010), Uganda (1995–2001, 2001–2006), Zambia (1996–2002).	10 cases, 9 countries Benin (2001–2006), Burkina Faso (2003–2010), Chad (2004–2015), Mozambique (1997–2003, 2003–2011), Niger (2006–2012), Nigeria (2003–2008), Rwanda (2000–2005), Tanzania (1999–2004), Zambia (2002–2007)
		14 cases, 10 countries	
Mid Transition	10 cases, 9 countries Comoros (1996–2012), Ghana (2003–2008), Kenya (2003–2009, 2009–2014), Lesotho (2004–2009), Namibia (2000–2007), Rwanda (2011–2015), Senegal (2013–2015), South Africa (1998–2016), Zimbabwe (1994–1999)	5 cases, 4 countries Ethiopia (2011–2016), Gabon (2000–2012), Lesotho (2009–2014), Zimbabwe (1999–2005, 2011–2015)	9 cases, 7 countries Cameroon (1998–2004, 2004–2011), Congo (2005–2011), Ghana (1998–2003, 2008–2014), Kenya (1998–2003), Namibia (2007–2013), Senegal (2011–2013), Zimbabwe (2005–2011).

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14 Mid-transition stalls, 10 countries

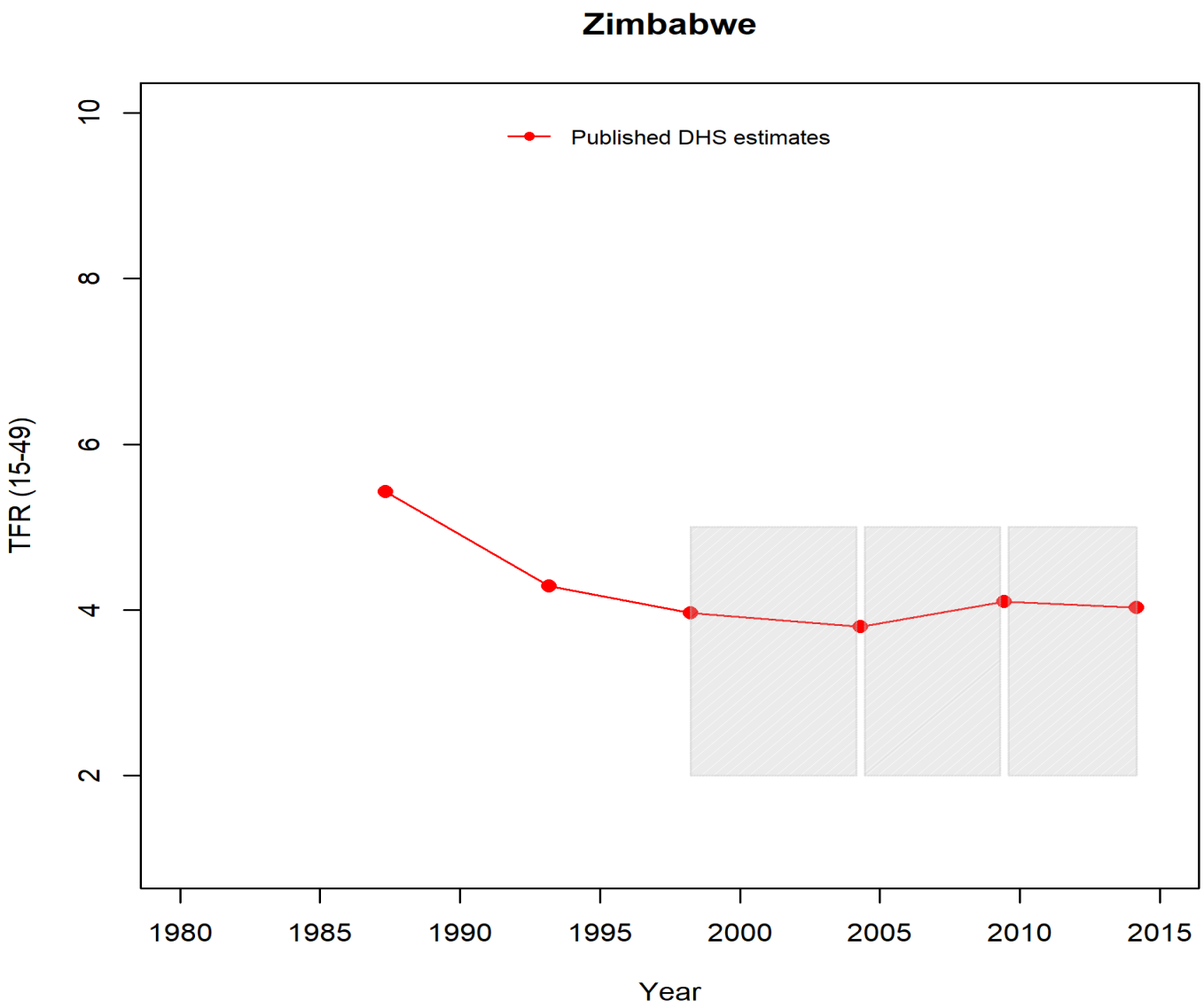
14 cases, 10 countries

5 cases, 4 countries	**9 cases, 7 countries**
Ethiopia (2011–2016), Gabon (2000–2012), Lesotho (2009–2014), Zimbabwe (1999–2005, 2011–2015)	Cameroon (1998–2004, 2004–2011), Congo (2005–2011), Ghana (1998–2003, 2008–2014), Kenya (1998–2003), Namibia (2007–2013), Senegal (2011–2013), Zimbabwe (2005–2011).

Consistency across methods and sources

- DHS Published Total Fertility rates (3 years before the survey)

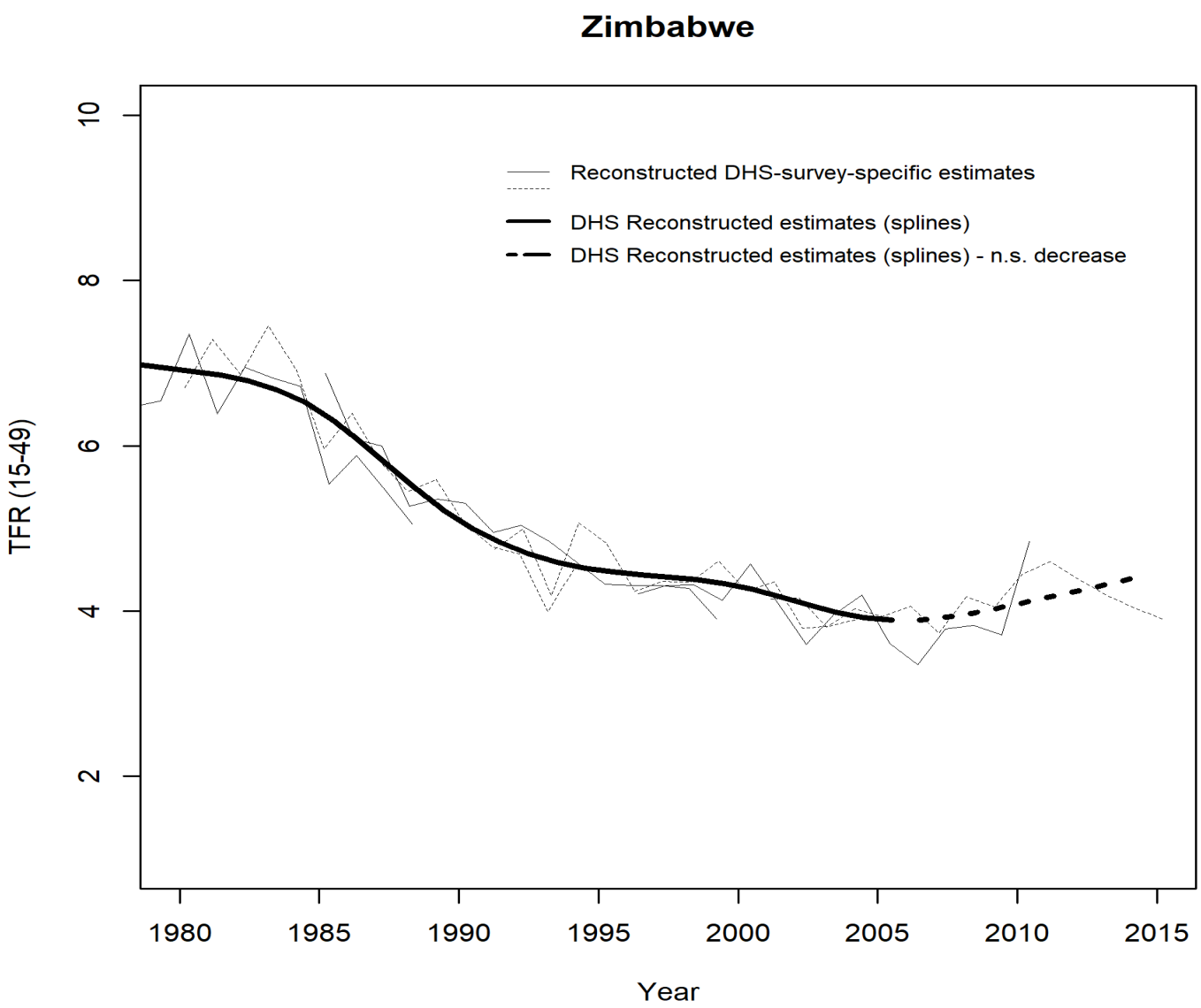
Consistency across methods and sources



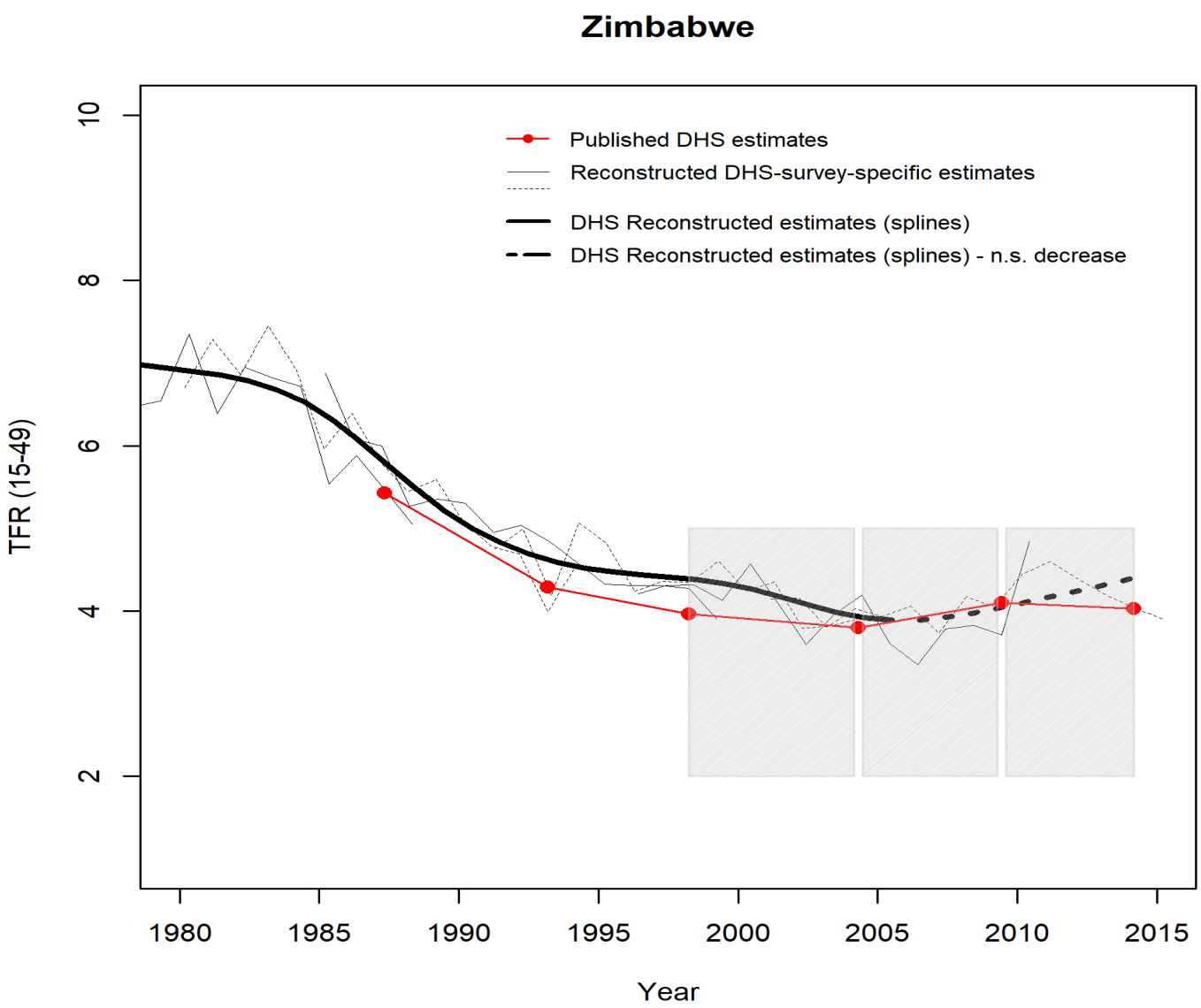
Consistency across methods and sources

- Reconstructed fertility trends with pooled birth histories
  - Poisson regression with restricted cubic splines

Consistency across methods and sources



Consistency across methods and sources



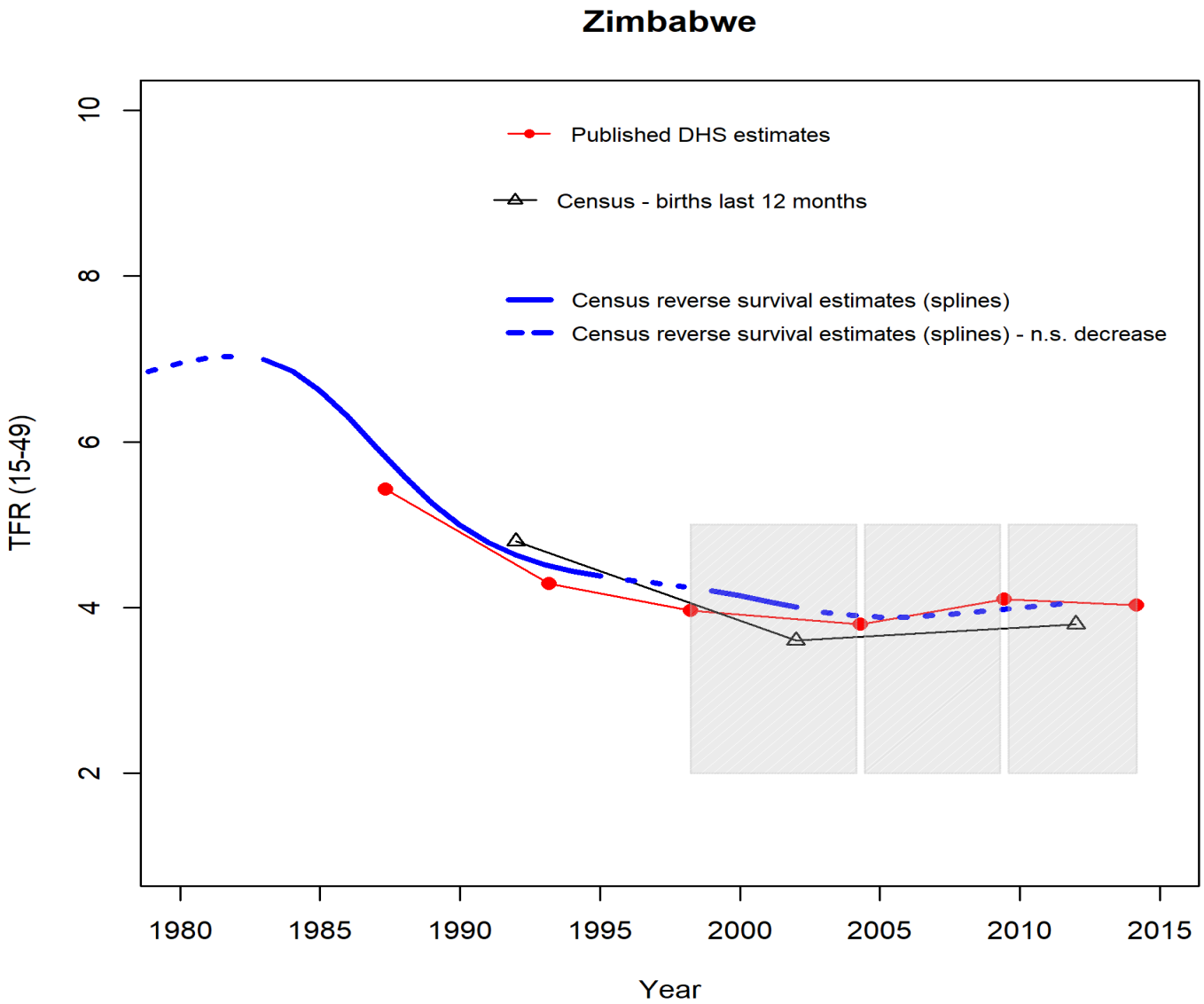
Consistency across methods and sources

Census data

- Reverse-survival method using census data
  - Using age structure of children <15 and women 15-64, survival probabilities, and age patterns of fertility
  - Fertility over the 15 years preceding each census
  - Restricted cubic splines
- TFR from census data if available (births in the last year)
  - Published in reports, or computed from micro data
  - Tend to be underestimated, but focus on trends

Consistency across methods and sources

Census data



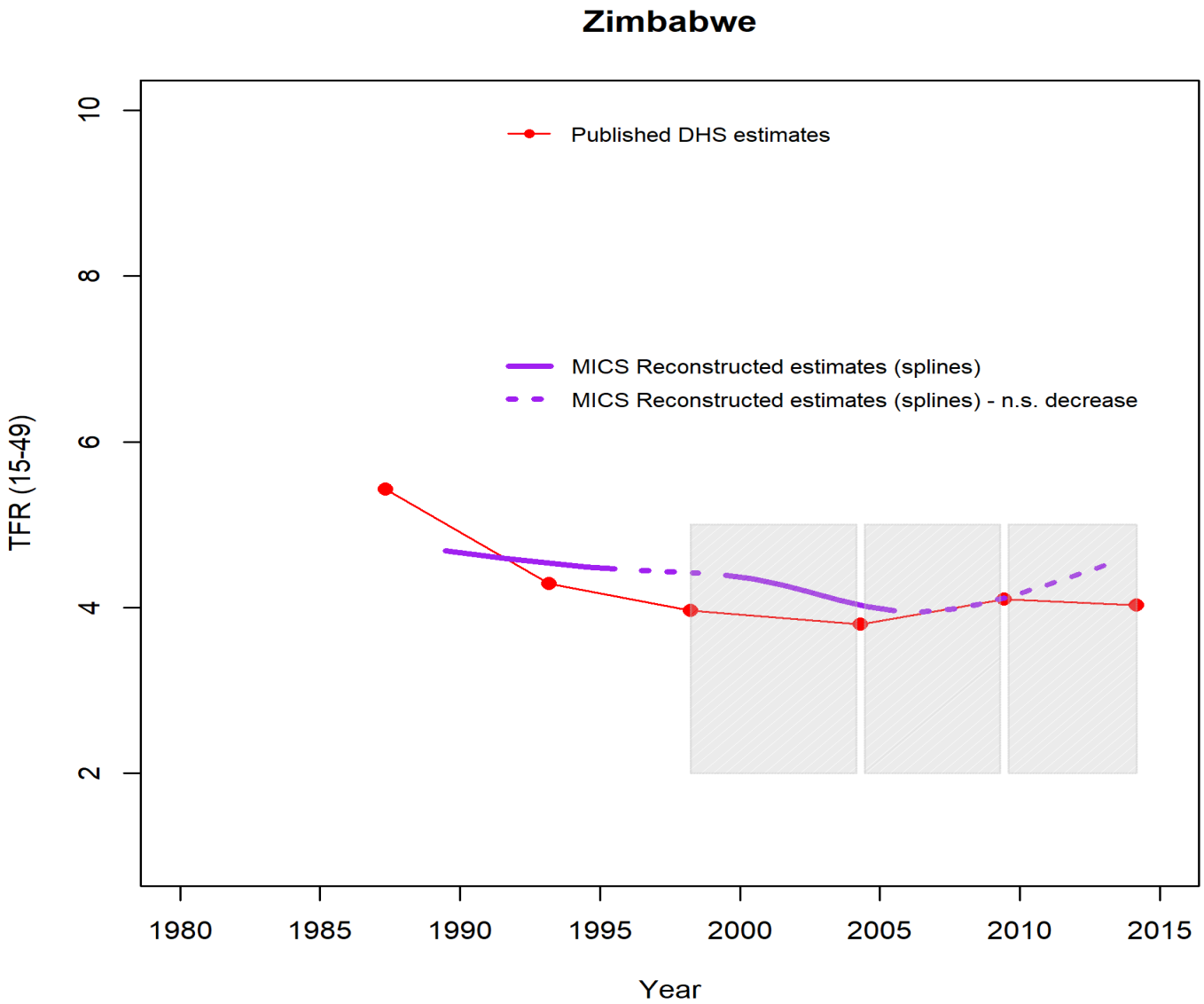
Consistency across methods and sources

MICS

- Two MICS
  - Reconstructed trends from birth histories
  - Poisson regression with restricted cubic splines

Consistency across methods and sources

MICS



Consistency across methods and sources

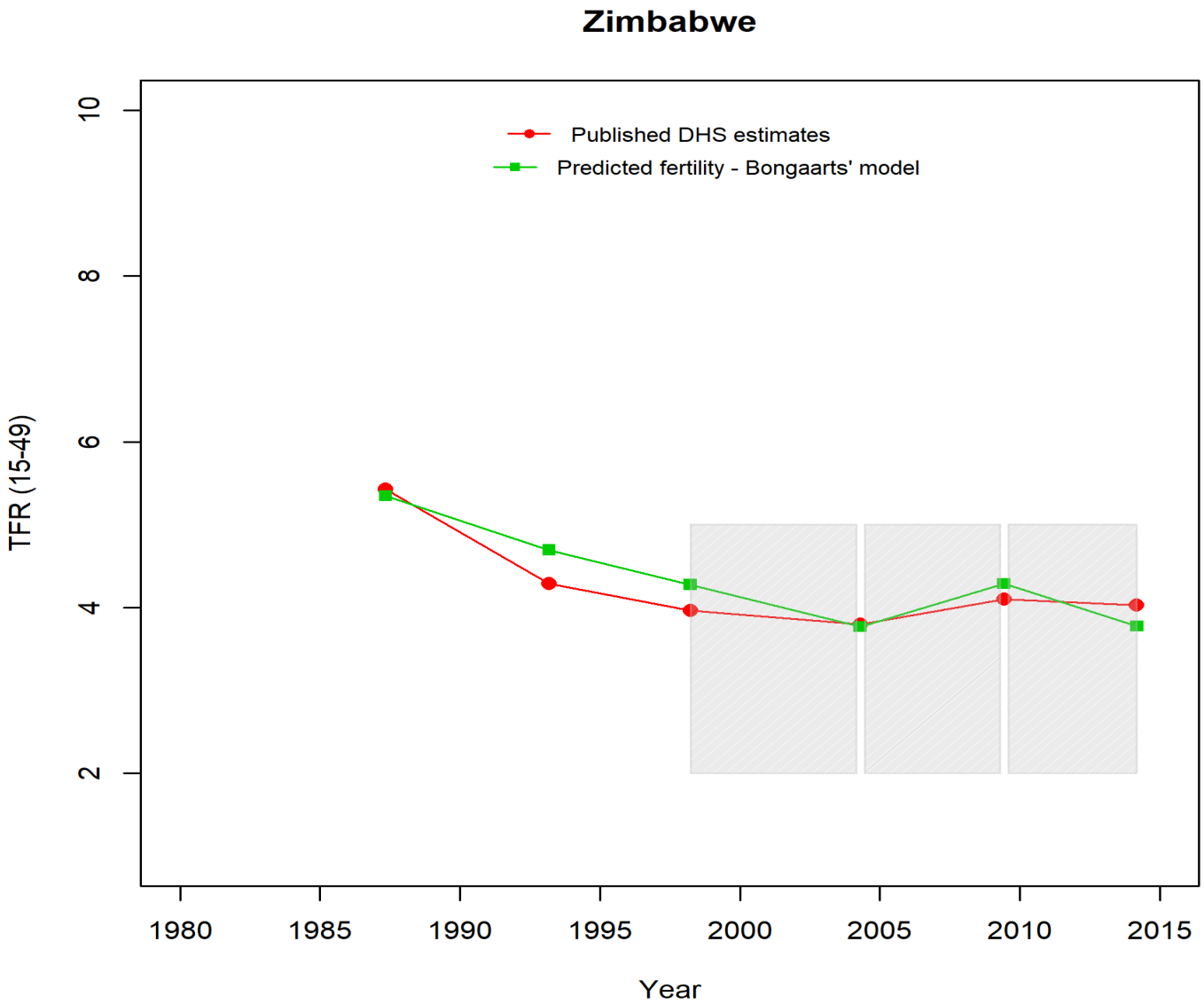
Bongaarts model

- Bongaarts revised model
- Computing indices of contraception, postpartum insusceptibility and marriage
- Computing expected fertility

$$TFR_e = 15.4 * C_c * C_m * C_i * C_a \quad (1)$$

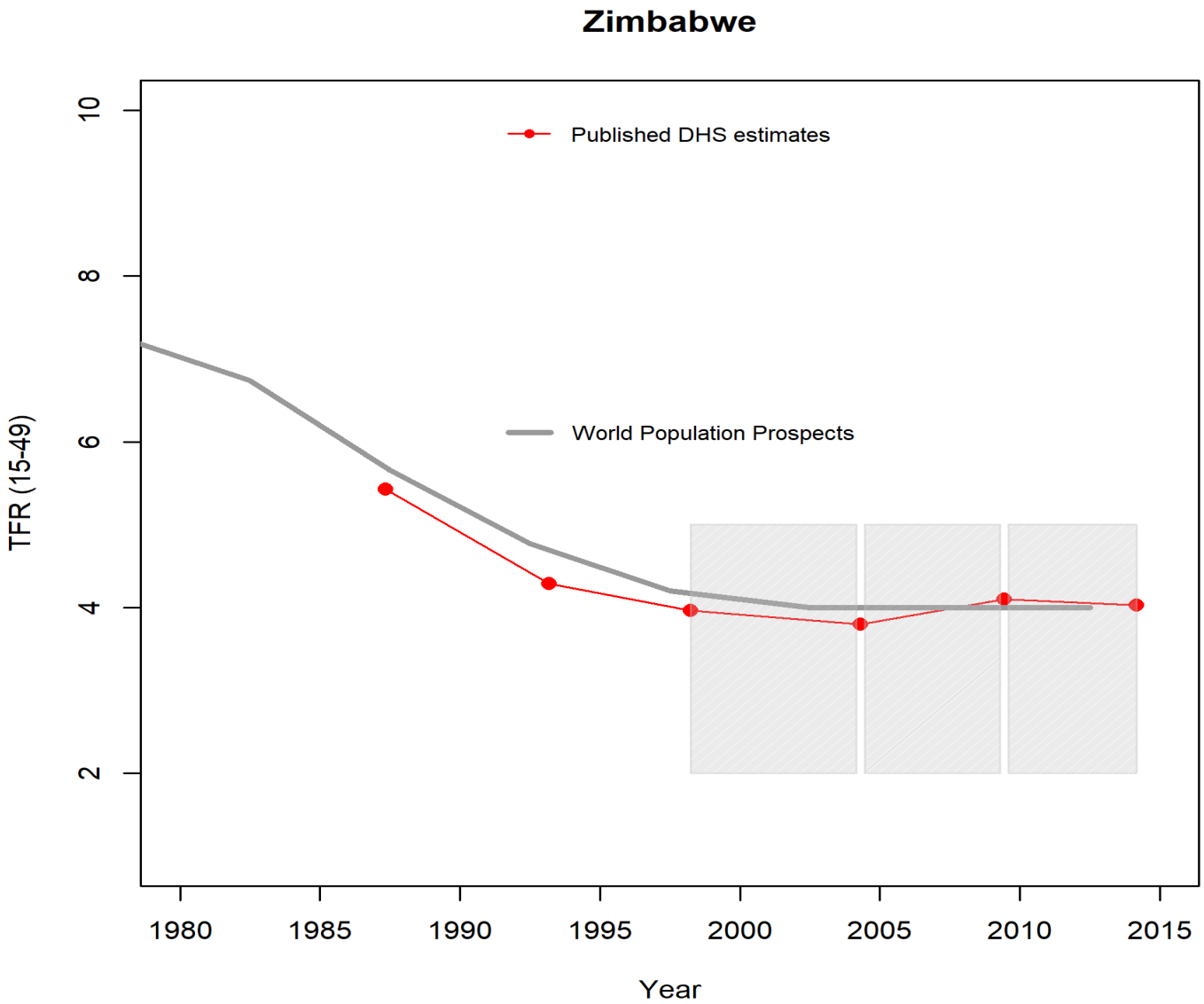
Consistency across methods and sources

Bongaarts model



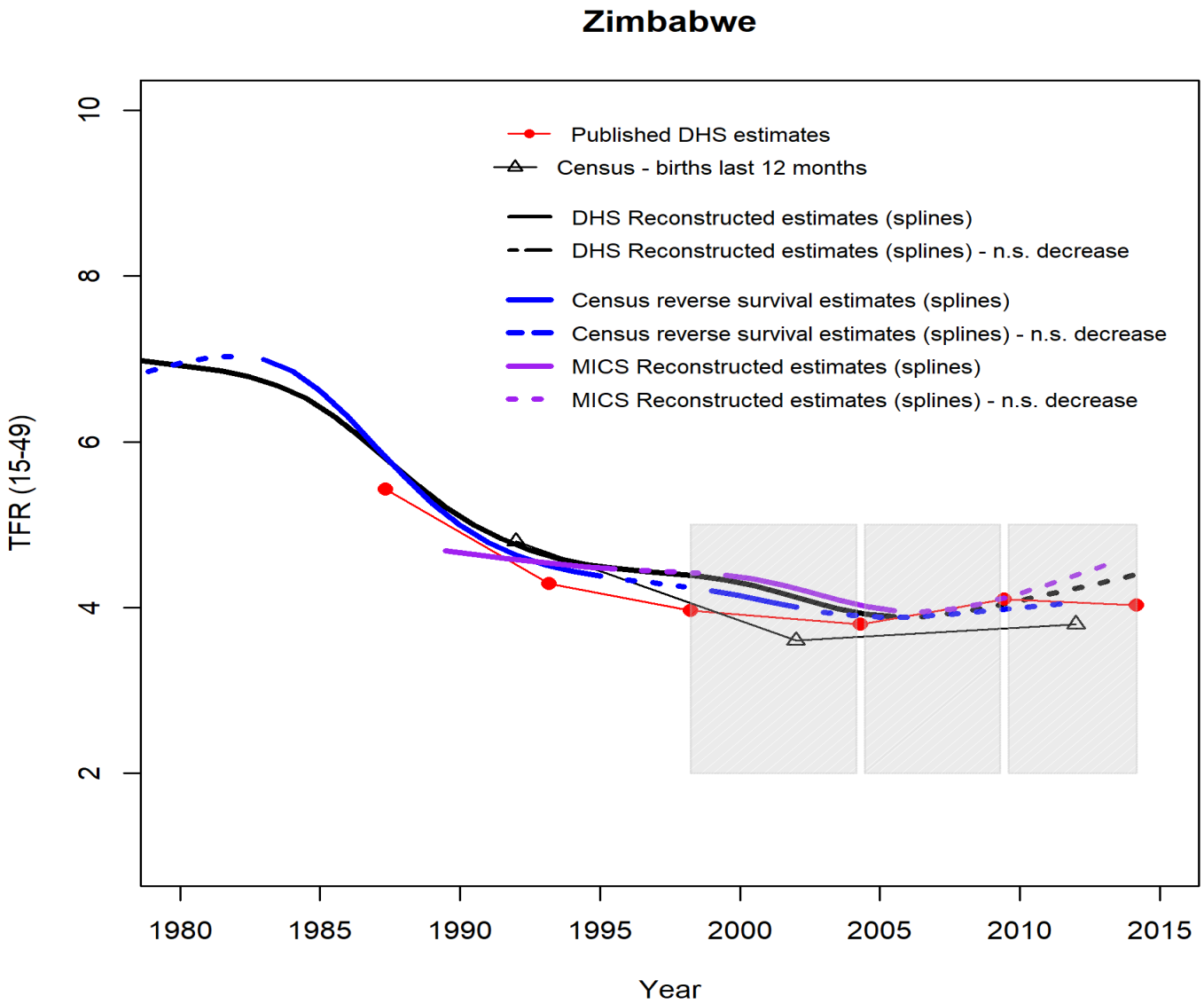
Consistency across methods and sources

2017 World Population Prospects



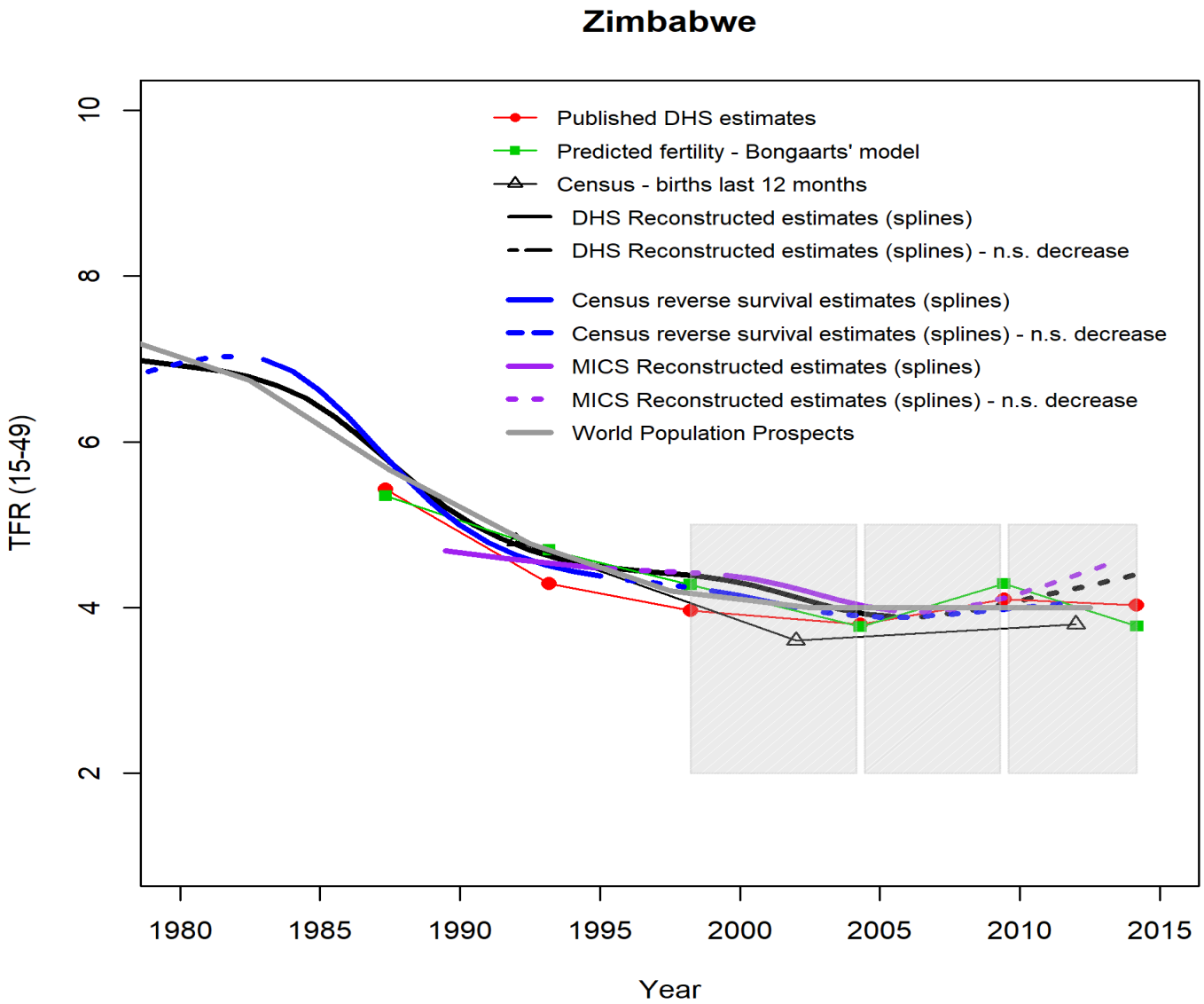
Consistency across methods and sources

All sources for evaluating stalls



Consistency across methods and sources

All sources for evaluating stalls + WPP + Bongaarts model



Consistency across methods and sources

Coding of consistency across sources

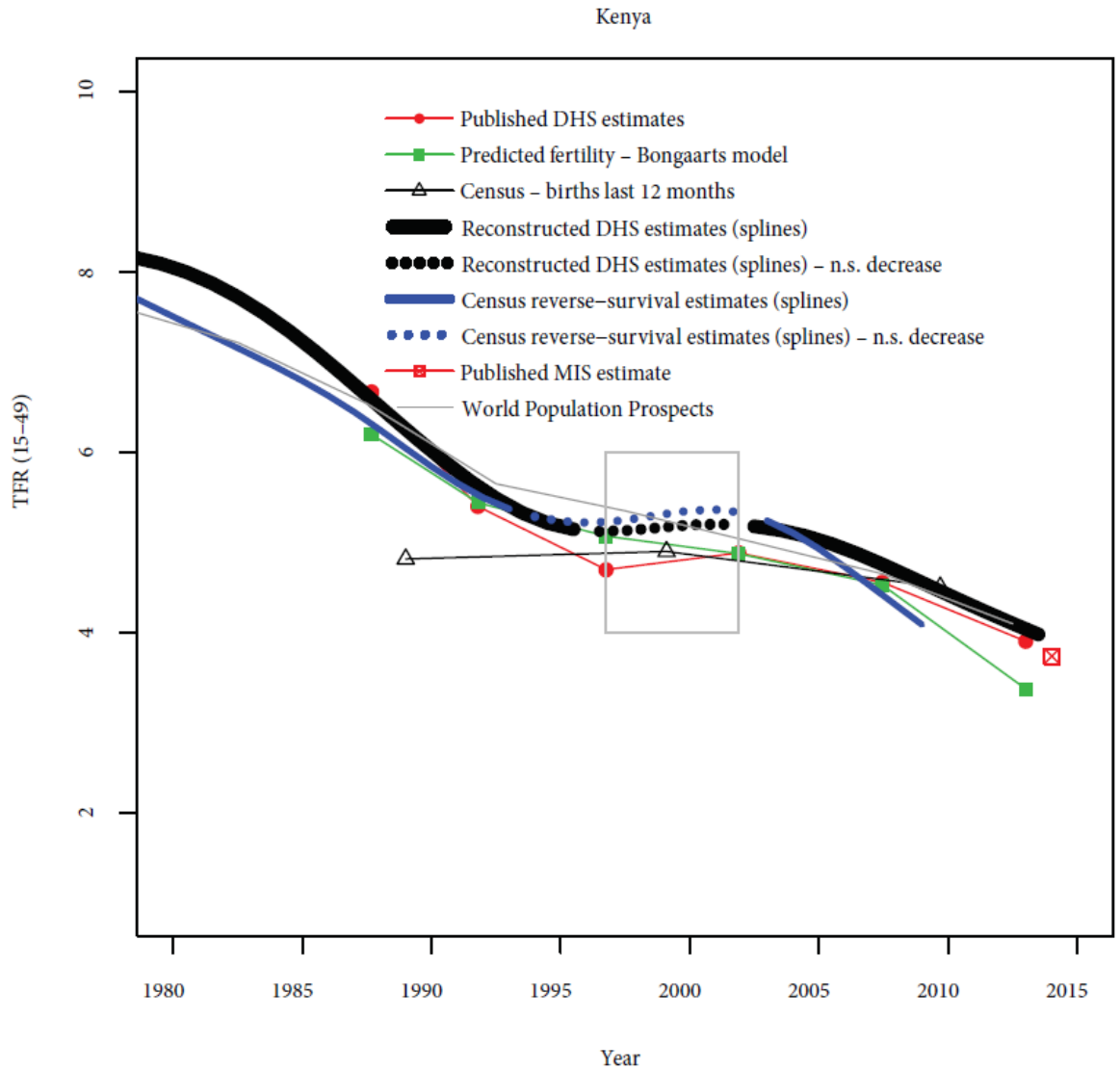
TABLE 4 Consistency in fertility trends across sources in Zimbabwe

	Period				
	1988–1994	1994–1999	1999–2005	2005–2011	2011–2015
DHS					
Published DHS estimates	−1.0	−1.0	0.5	1.0	1.0
Reconstructed DHS estimates	−1.0	−1.0	−1.0	1.0	1.0
D-index (Consistency of DHS-based estimates)	**−1.00**	**−1.00**	**−0.25**	**1.00**	**1.00**
Other data sources					
Censuses (reverse survival)	−1	0	−0.5	1	0.5
Census (births last 12 months)	*No data*	−1	−0.5	1	0.5
Reconstructed MICS estimates	−0.5	0.5	−1	1	1
O-index (Consistency of other data sources)	**−0.75**	**−0.17**	**−0.67**	**1.00**	**0.67**

NOTE: A value of 1 corresponds to strong support for a stall, and a value of –1 strong support for the absence of a stall.

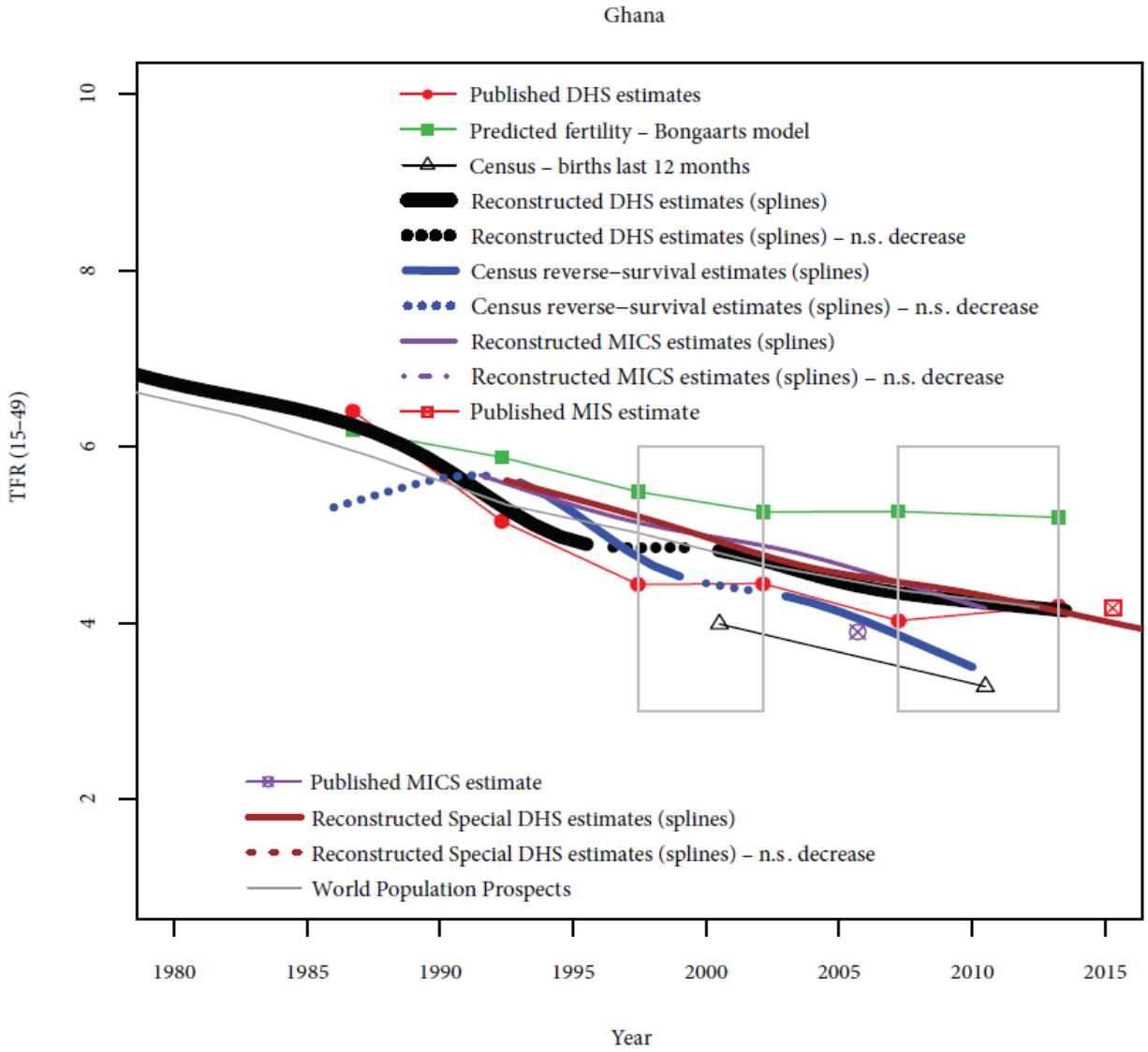
Consistency across methods and sources

Kenya



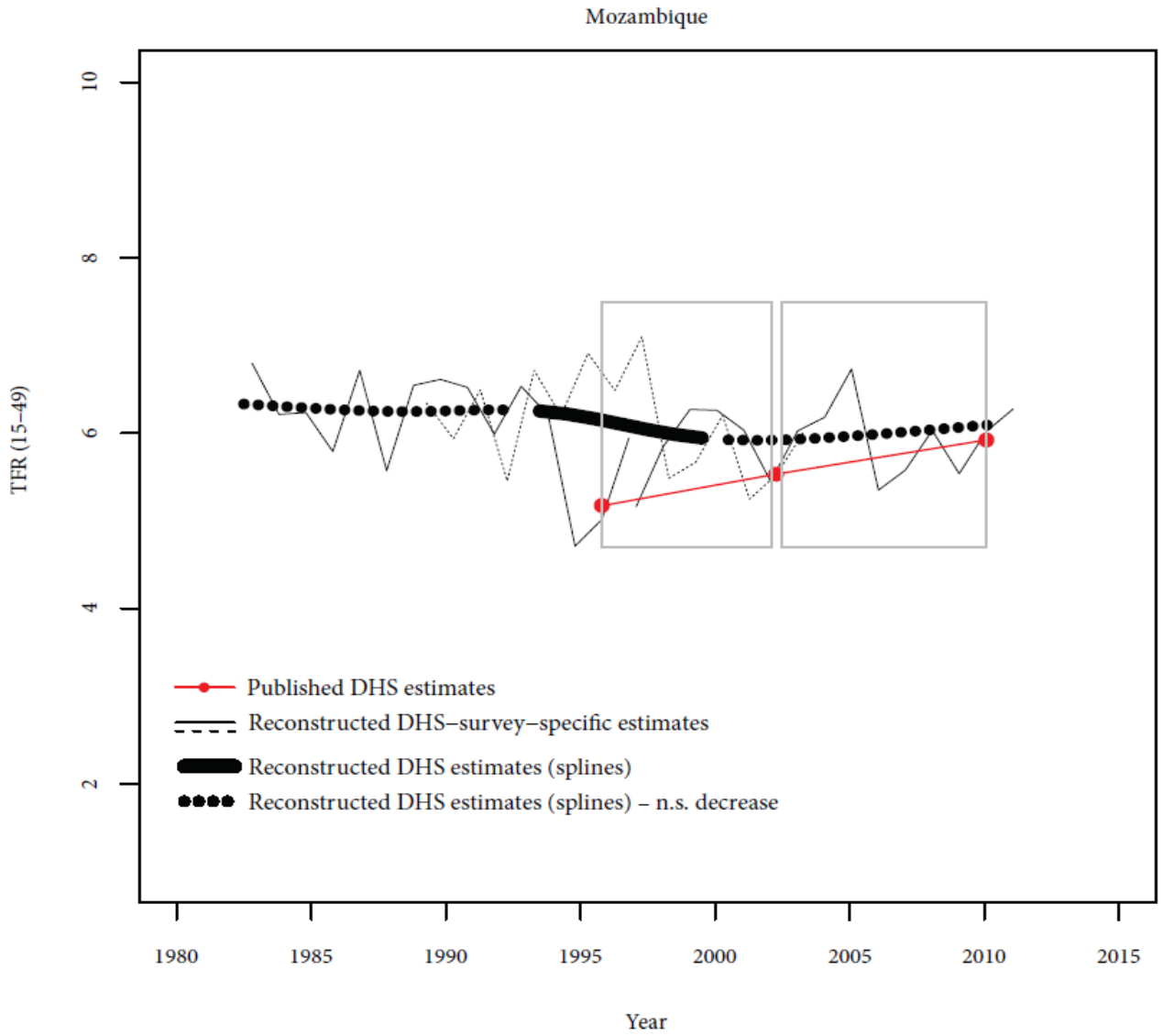
Consistency across methods and sources

Ghana



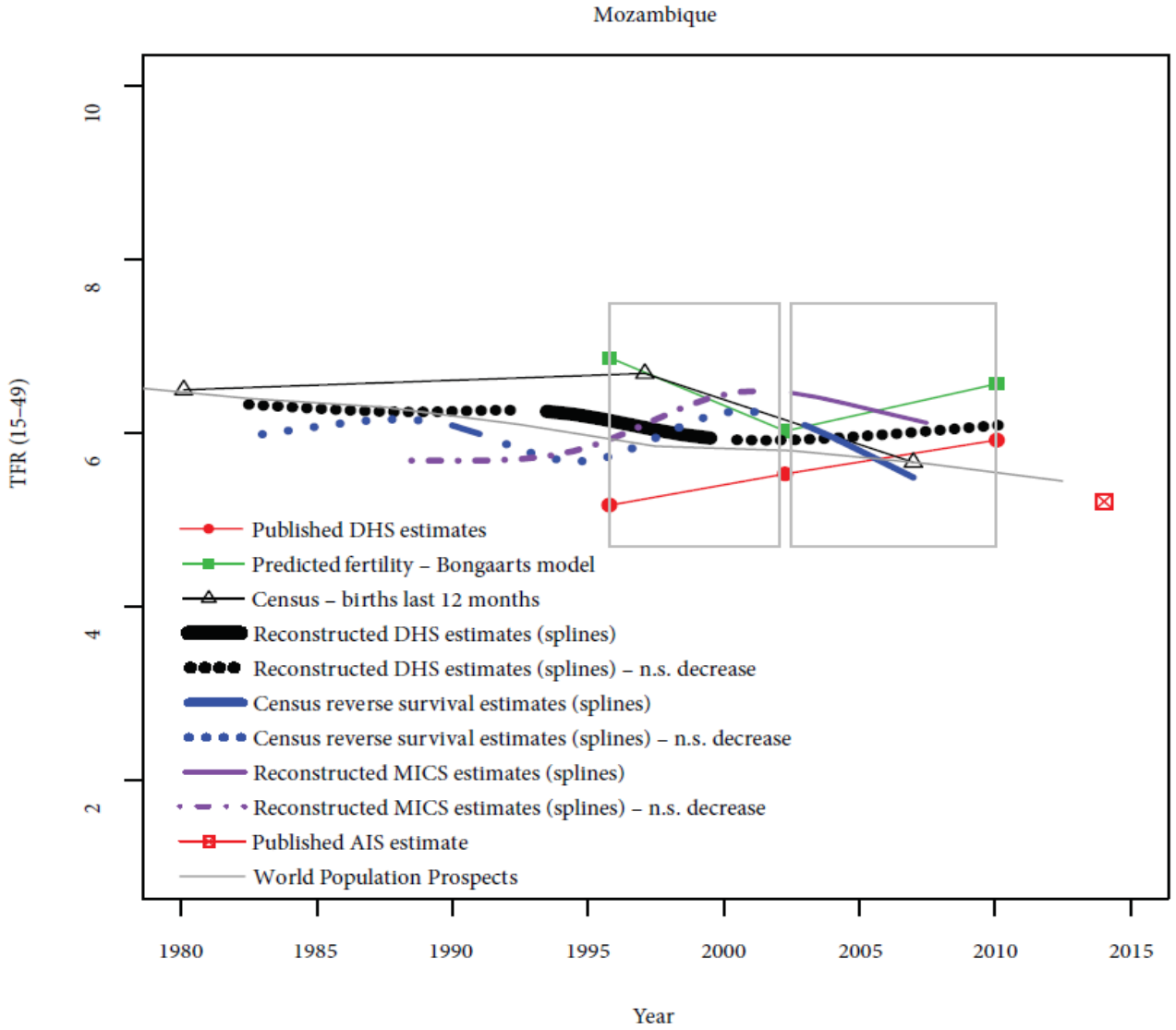
Consistency across methods and sources

Mozambique



Consistency across methods and sources

Mozambique



In summary

- Unambiguous evidence for stalls in 2 cases : Zimbabwe (2005-2011) and Namibia (2007-2013)
  - Mainly recent stalls
- Very strong or strong evidence in a few additional countries (5 cases)
  - Cameroon (1998-2004), Congo (2005-2011), Kenya (1998-2003), Zambia (2002-2007), Zimbabwe (2011-2015)
- Moderate evidence in 6 countries
  - Côte d'Ivoire, Gabon, Madagascar, Nigeria, South Africa, Tanzania
- Weak or conflicting evidence evidence in several countries
  - Ghana, Benin, Rwanda, etc.
- No evidence in 52 cases out of 78

Conclusion

- The number of stalls depends very much on definition, data and method
- Strong evidence for stalls in 5 countries
  - Namibia, Zimbabwe, Kenya, Zambia, Congo
- Stalls are not widespread but not uncommon, and ongoing
- Other stalls may be found with other data
  - Botswana, South Africa, Côte d'Ivoire
- Stalls at the subnational level
  - By education (Kebede et al., 2019)
  - Stalls seem to be widespread in capital cities
- Further analyses : focus on the 5 countries
  - Demographic dynamics and socioeconomic causes of the stalls