Changes in proximate determinants of fertility in sub-Saharan Africa

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Quality and comparability of demographic data in sub-Saharan Africa
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Background

- Several sub-Saharan African countries (SSA) seem to have slowed down the pace of fertility decline, but the findings are inconclusive. *(Casterline 2001, Bongaarts 2008, Garenne 2008, Schoumaker 2009, Sharpiro 2010, Sneeringer 2009)*

- One reason for the disagreement may be due to the lack of consideration to the DHS data quality. Age displacement of children and omission may have affected recent fertility trends. (*Schoumaker 2008, Machiyama 2009)*

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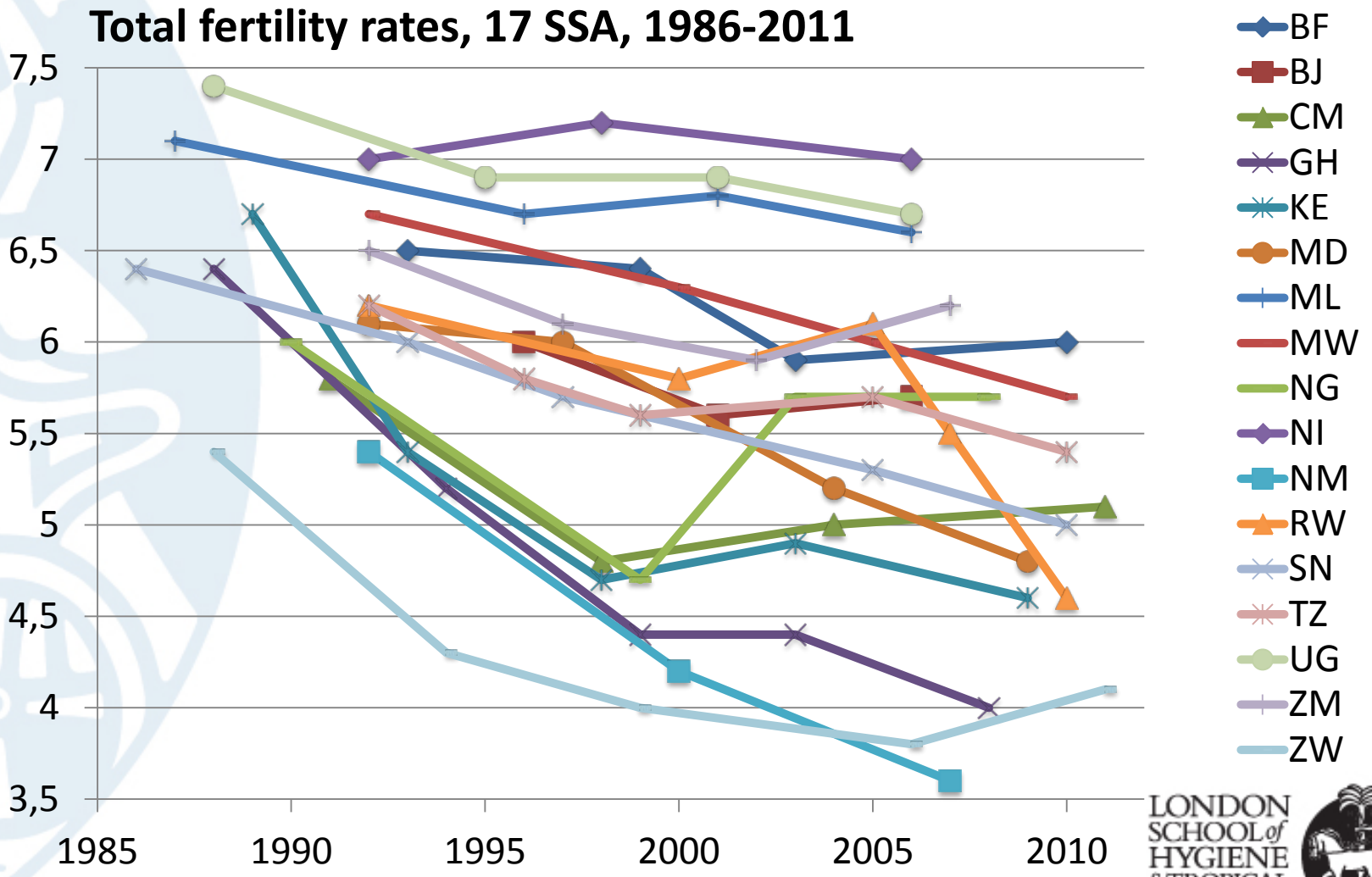
Observed TFR from DHS reports



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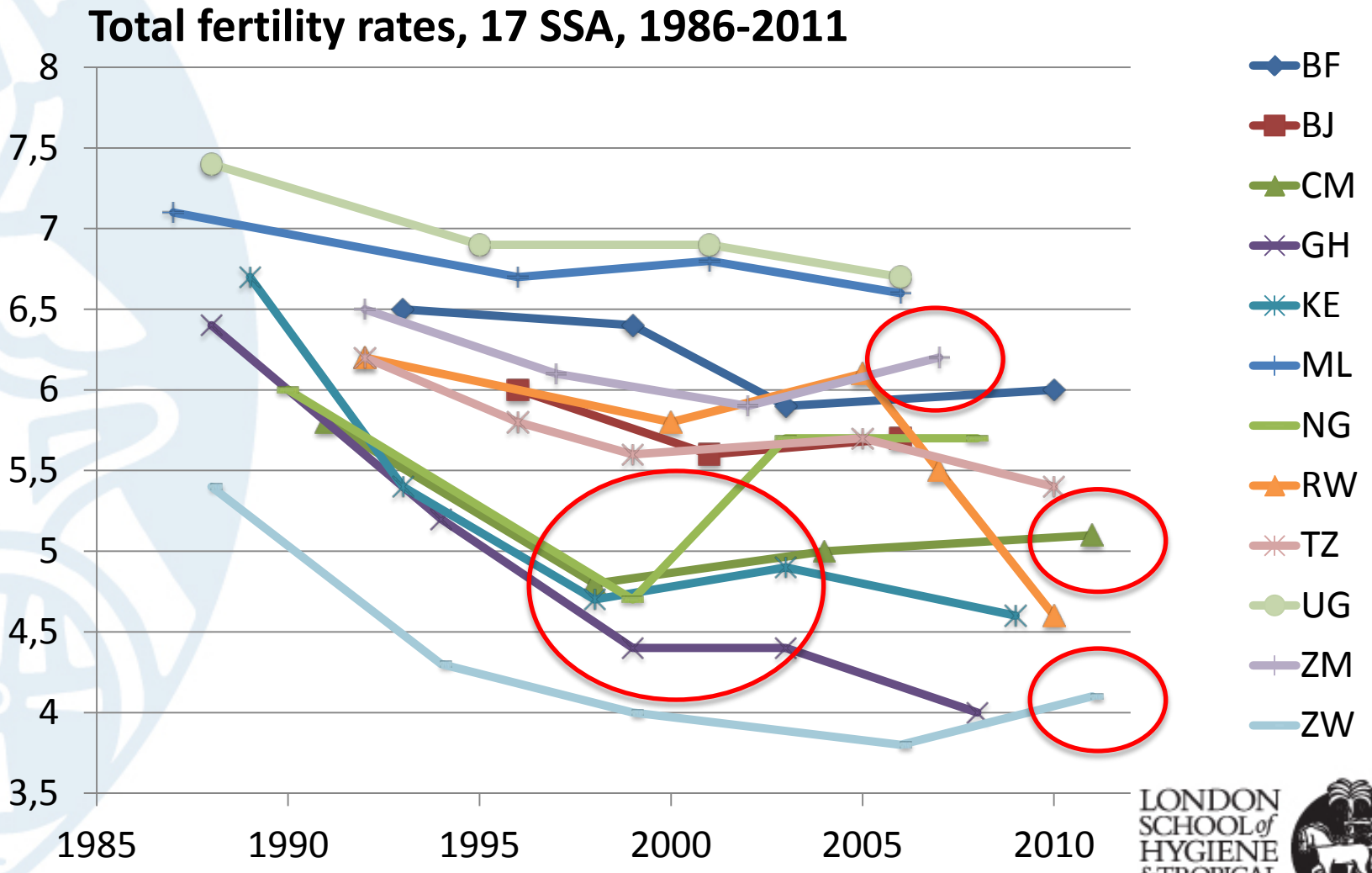
TFR from DHS reports – no decline?



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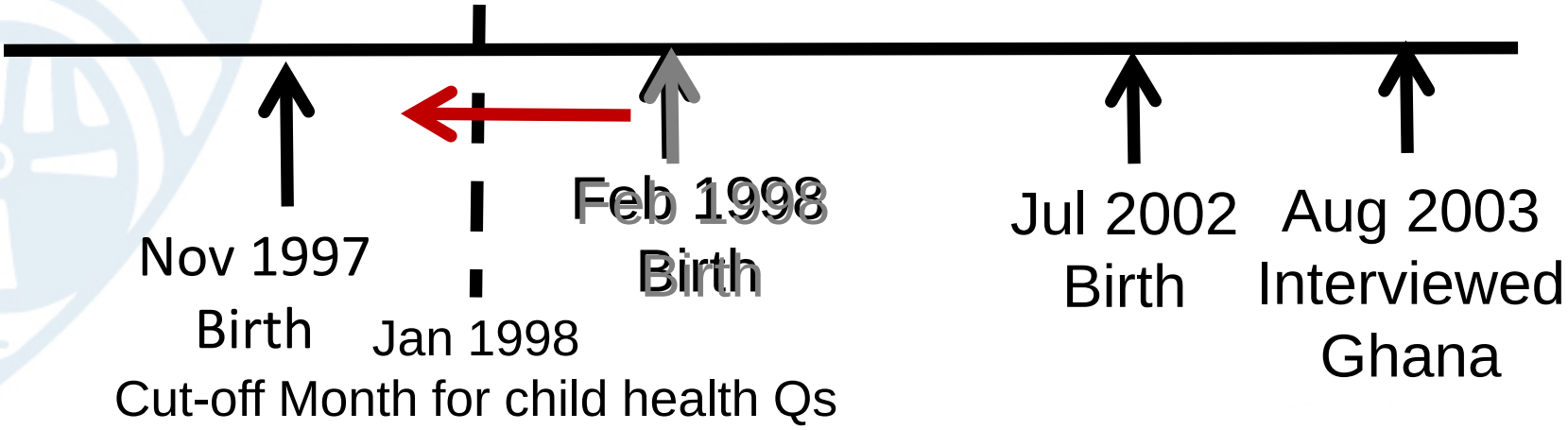
Incl. TFR from preliminary reports

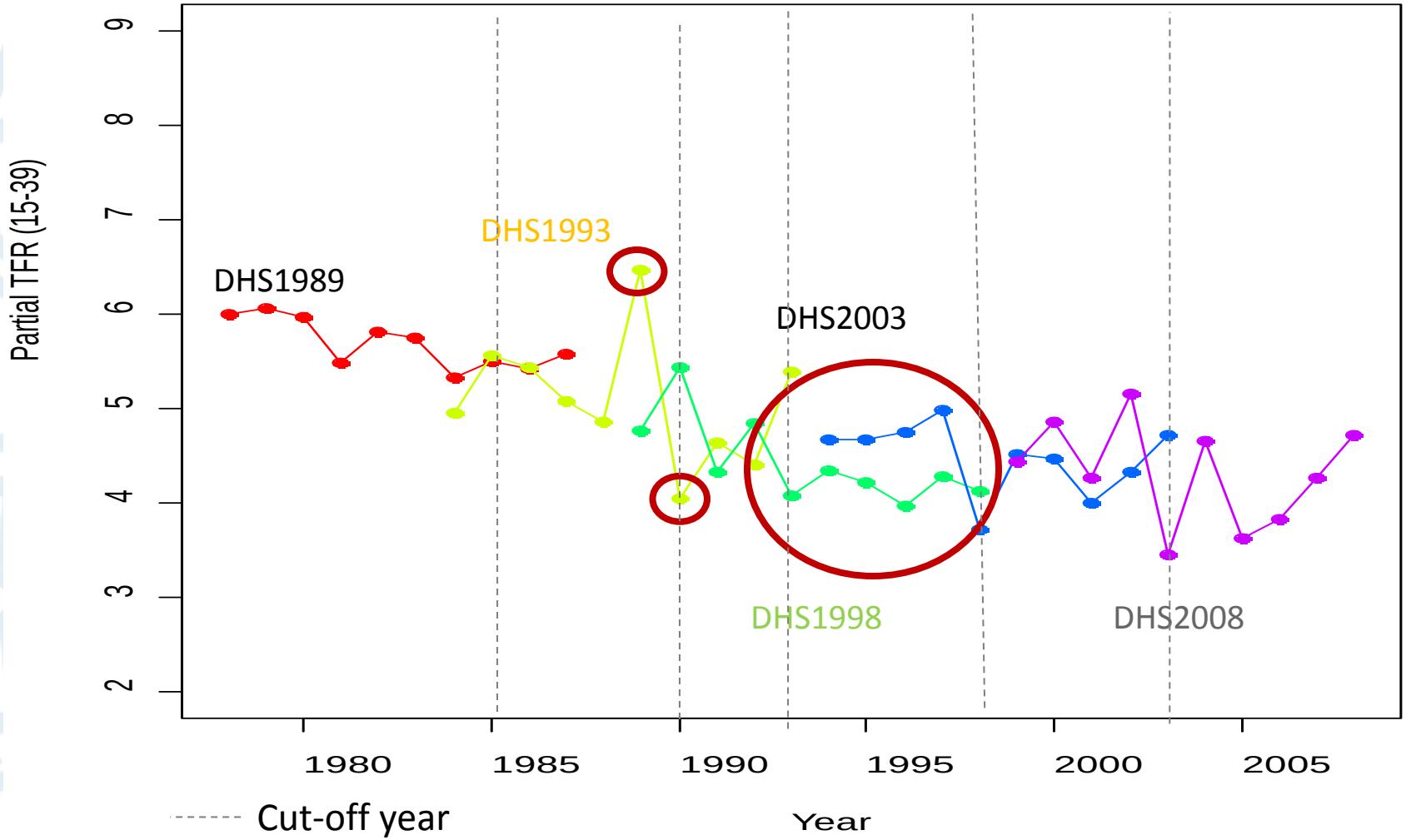
Potential non-sampling errors

- Digit preference in women's age
- Age displacement of women
- Age displacement of children
- Incomplete age reporting (women & children)
- Different composition of women
- Use of different sampling frame
- Omission of births



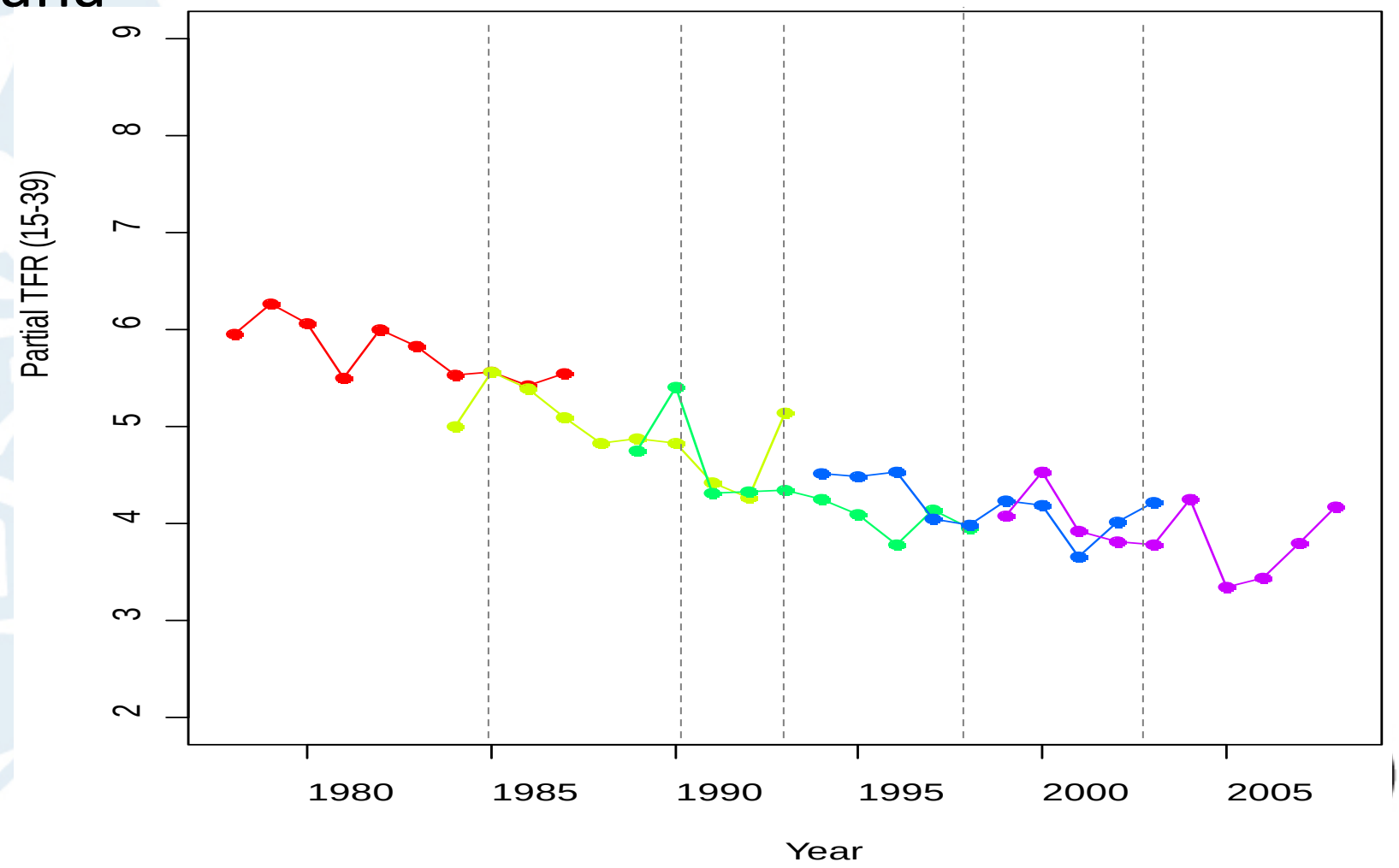
Data quality problems on fertility trends - unadjusted

Ghana



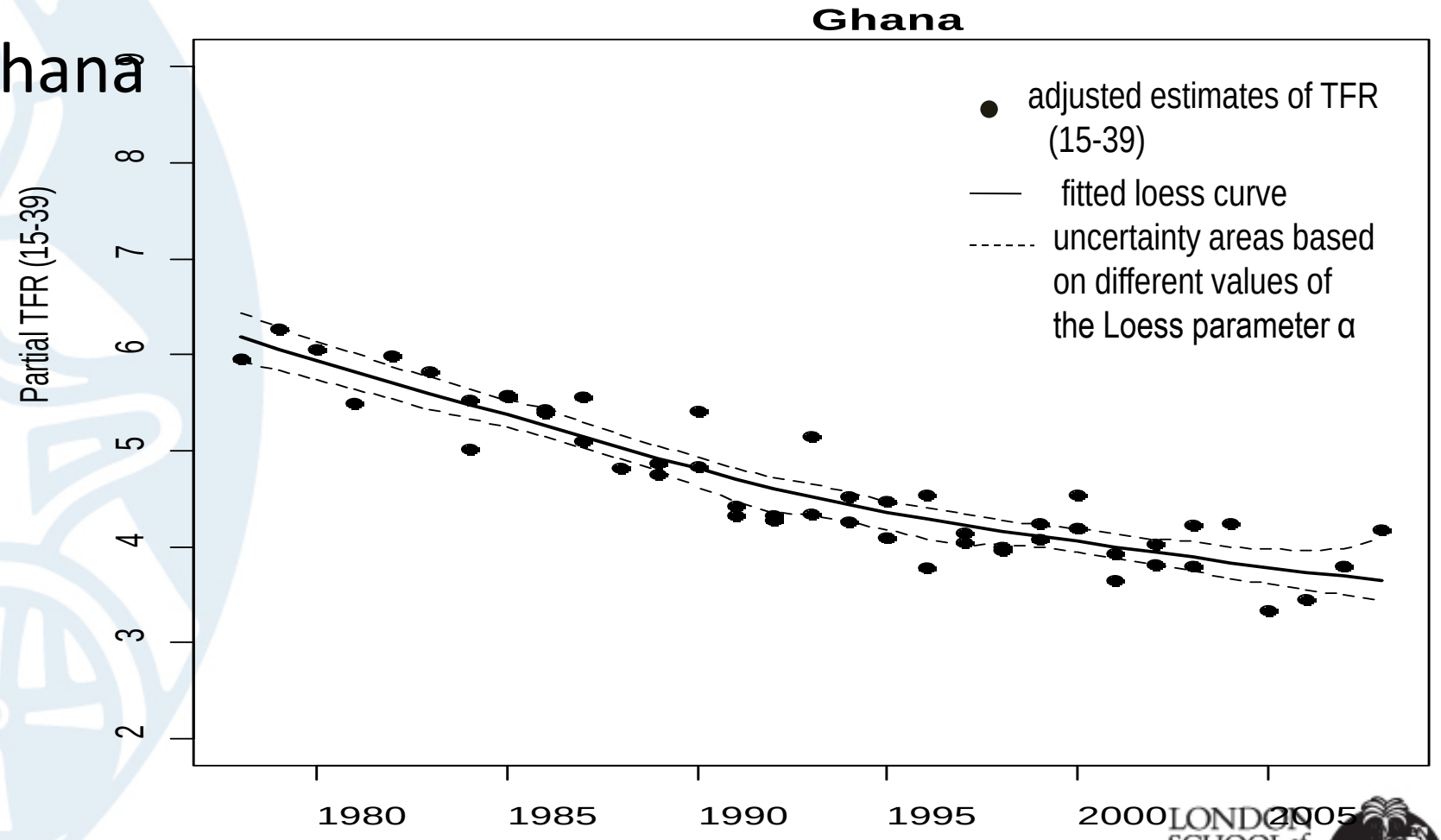
Data quality problems on fertility trends - adjusted

Ghana



TFR (15-39): Loess-based approach

Ghana



Machiyama, K., Silverwood, R. Sloggett, A., and Cleland, J. 2009. Recent Fertility Declines in Sub-Saharan Africa:Analysis of country trends of fertility decline. Paper prepared for the 2010 Quetelet Seminar, 24-26 November 2010, Louvain-la-Neuve, Belgium..

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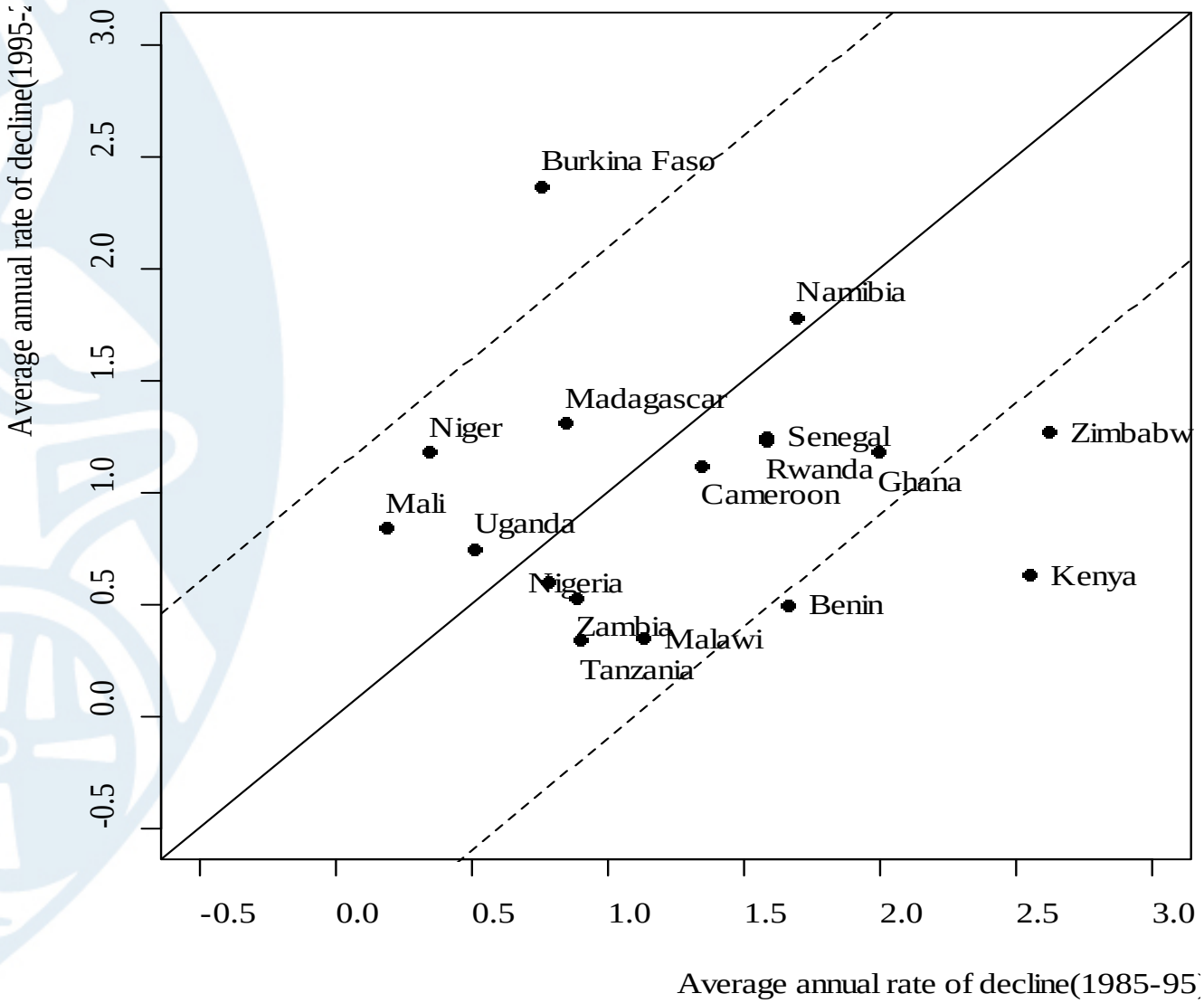
Changes in pace of fertility decline between 1985-95 and 1995-2005



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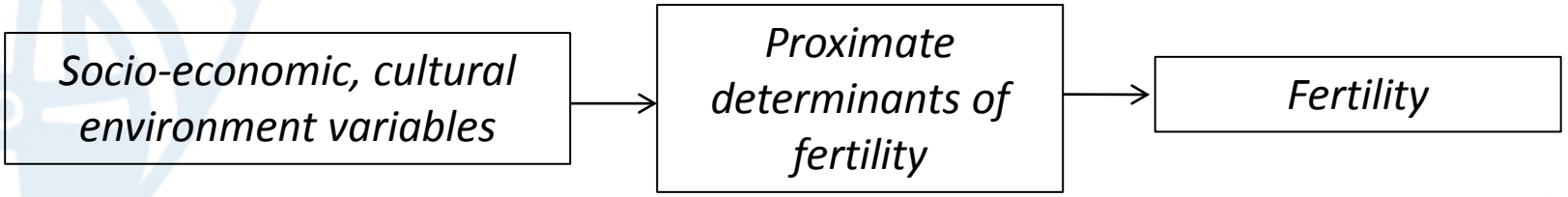
Background- cont'd

- Few studies examined the mechanisms of the deceleration. Fertility changes should be supported by behavioural changes of fertility, i.e. the proximate determinants of fertility. Few applied the proximate determinants model to SSA. (*Stover 1998, Kiersten et al. 2011)*

- An examination of changes in proximate determinants provide an opportunity to assess what extent observed/fitted TFR estimates are consistent with the behavioural changes of fertility



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Research objectives

1. To assess changes in the proximate determinants in 17 sub-Saharan African countries over the past two decades

2. To explore what extent changes of the proximate determinants support the estimated fertility decline by using the modified Bongaarts framework

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Methods

Data

65 DHS surveys in 17 SSA countries with 3 or more surveys undertaken (1986-2010)

Benin, Burkina Faso, Cameroon, Ghana, Kenya, Madagascar, Malawi, Mali, Namibia, Niger, Nigeria, Rwanda, Senegal, Tanzania, Uganda, Zambia and Zimbabwe

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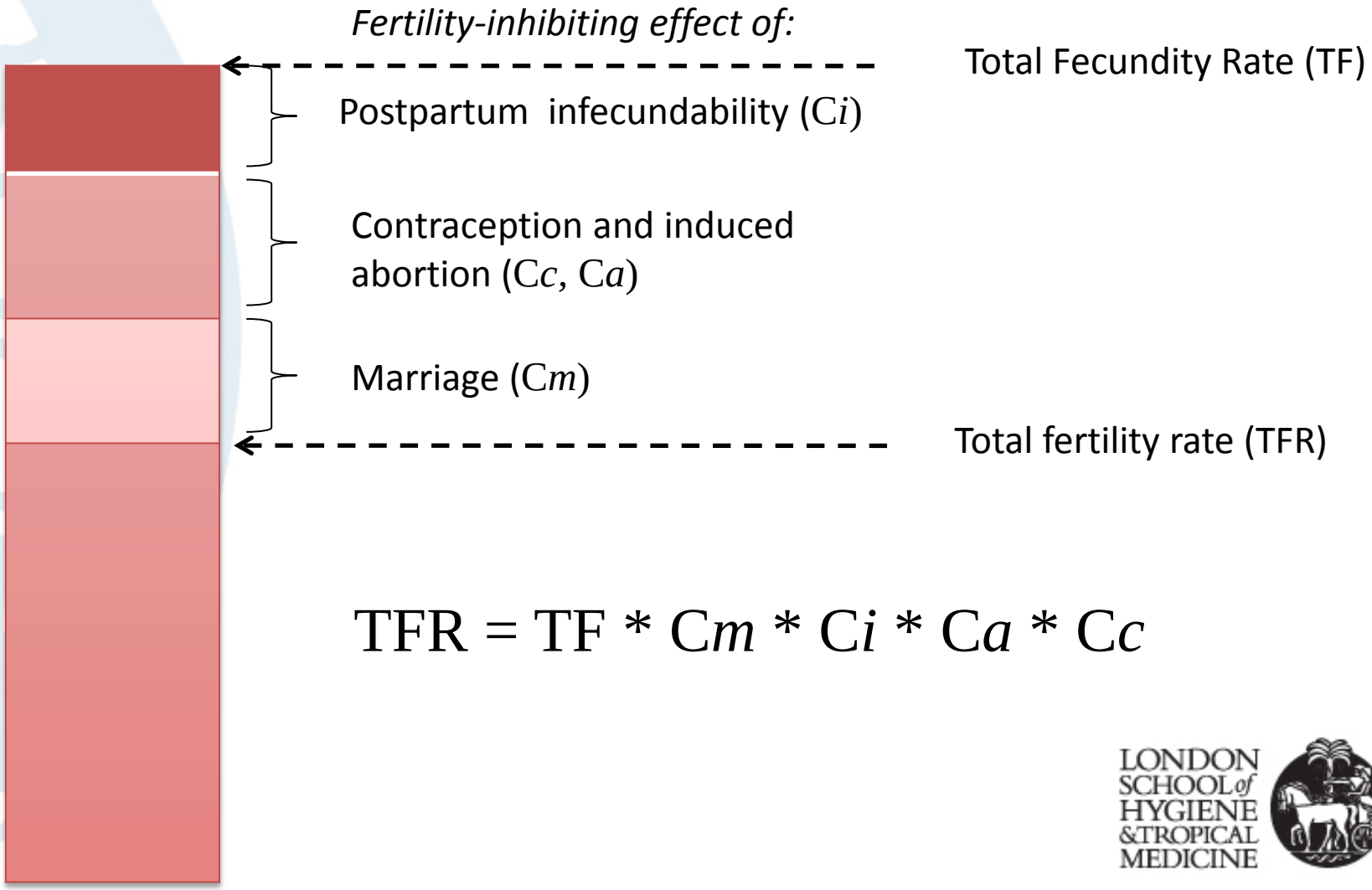
Methods: Bongaarts proximate determinants framework *(1978, 1982)*



$$TFR = TF * Cm * Ci * Ca * Cc$$

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Characteristics of African fertility

The original Bongaarts model is not applicable to SSA
(e.g. Bongaarts 1983, Caldwell 1992)

- Appreciable premarital sex and childbearing
  (Garenne et al. 2006)
- Lower frequency of sex within marriage
  (Caraël 1995, Brown 2000)
- Polygyny
- High infertility *(Frank 1983, Larsen, 1999)*
- High reliance on traditional family planning methods
  (Johnson-Hanks 2002, Che et al. 2004)

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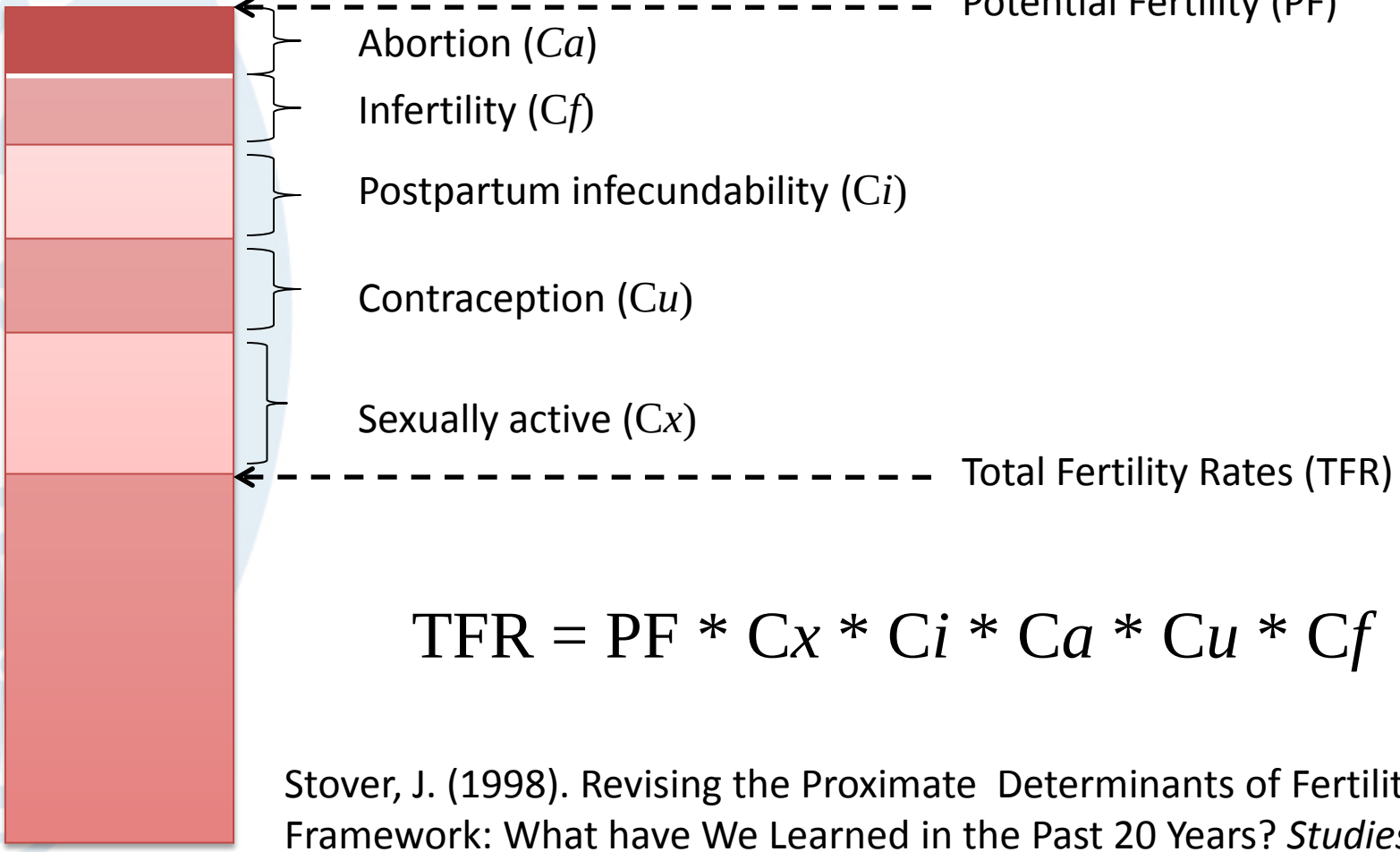
Methods

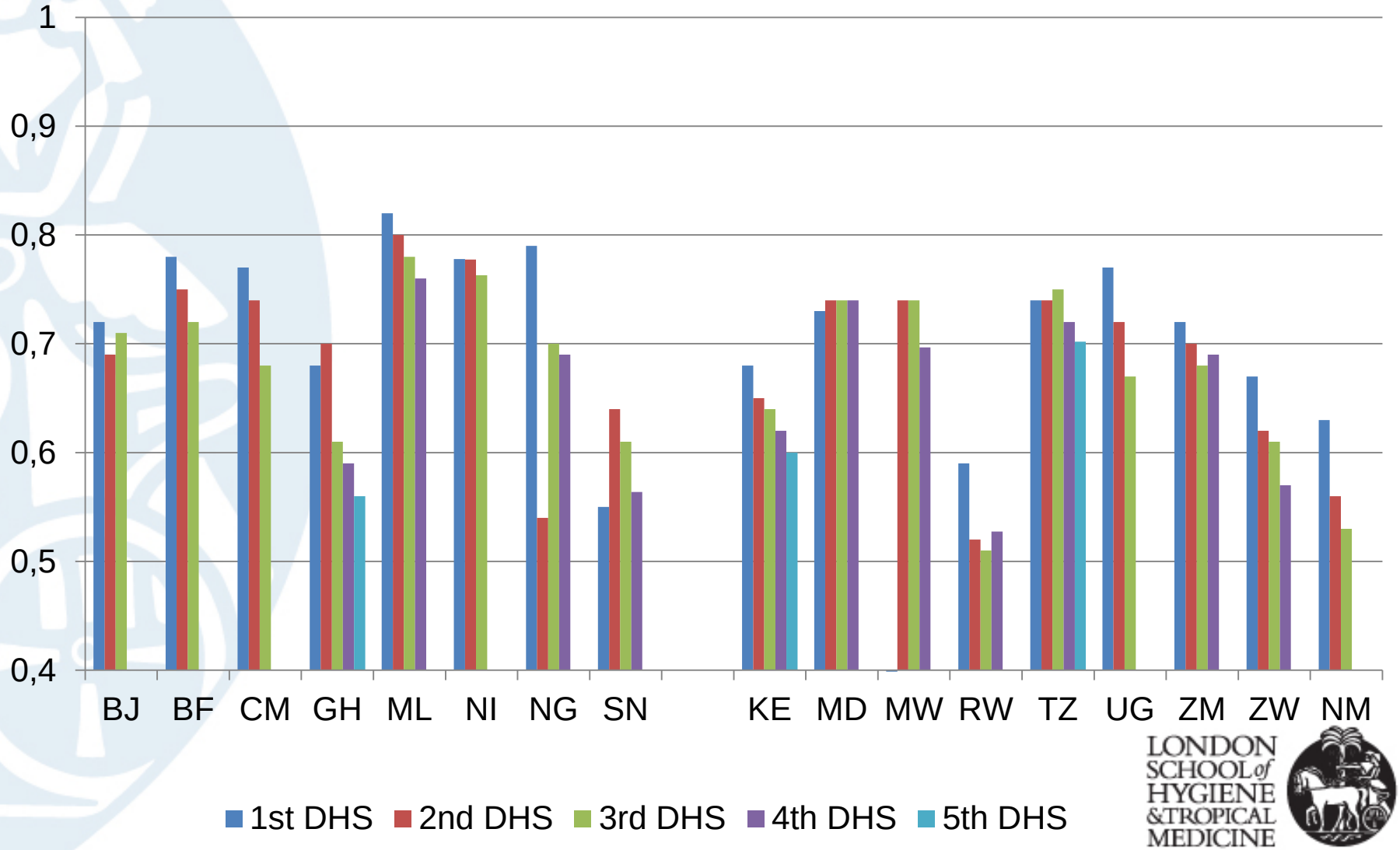
Stover's revision (1998)



$$TFR = PF * Cx * Ci * Ca * Cu * Cf$$

Stover, J. (1998). Revising the Proximate Determinants of Fertility Framework: What have We Learned in the Past 20 Years? *Studies in Family Planning* 29(3):255- 267.

Results: Index of sexually active



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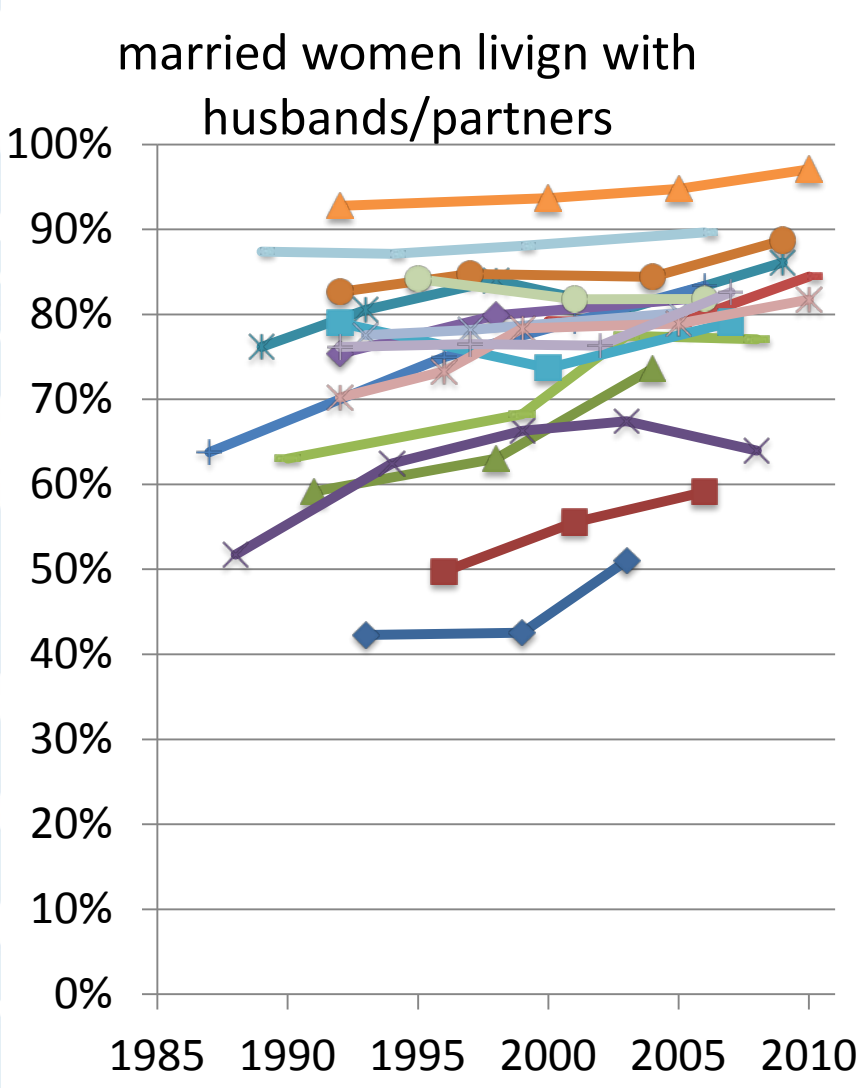
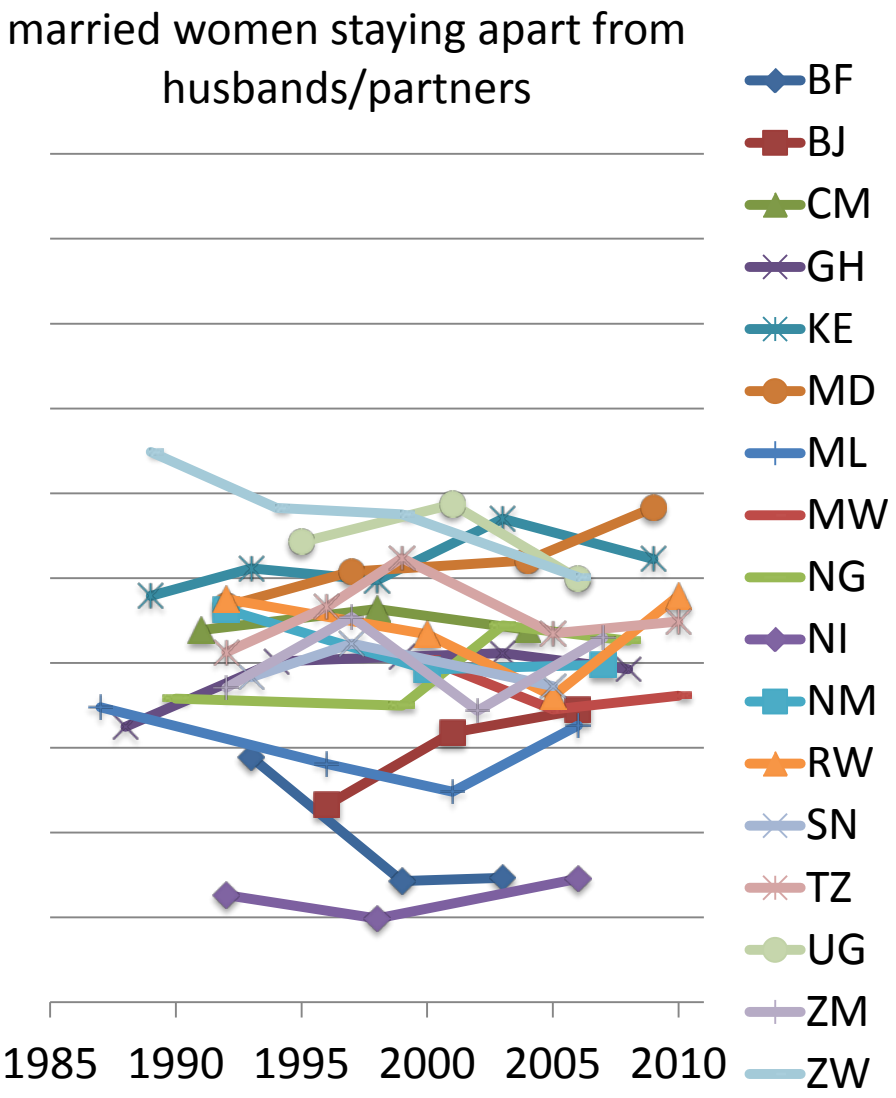
Recent sex by co-residence

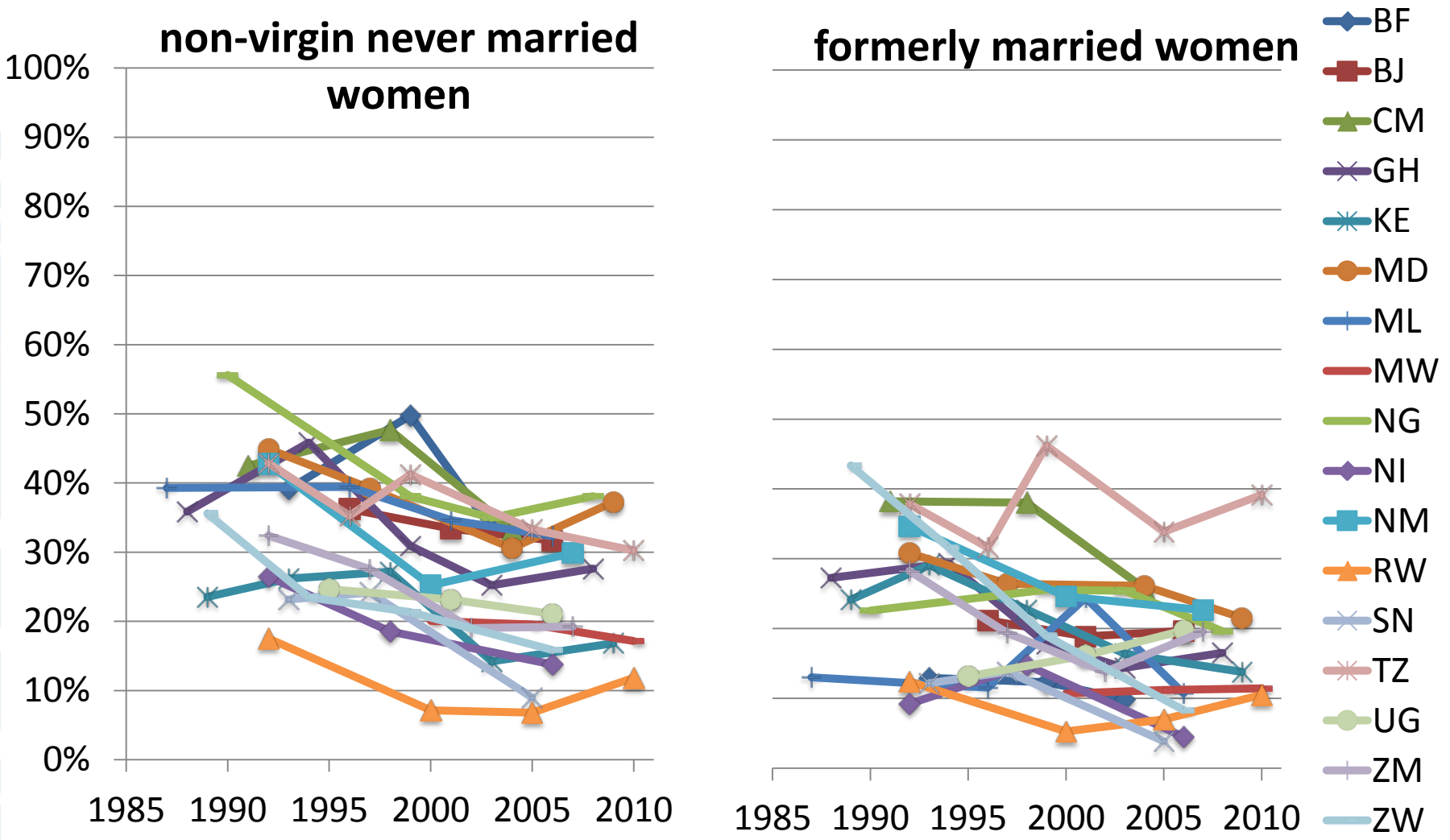
Proportions of married women (15-39) who had sex in the last 28 days by co-residential status. 17 SSA



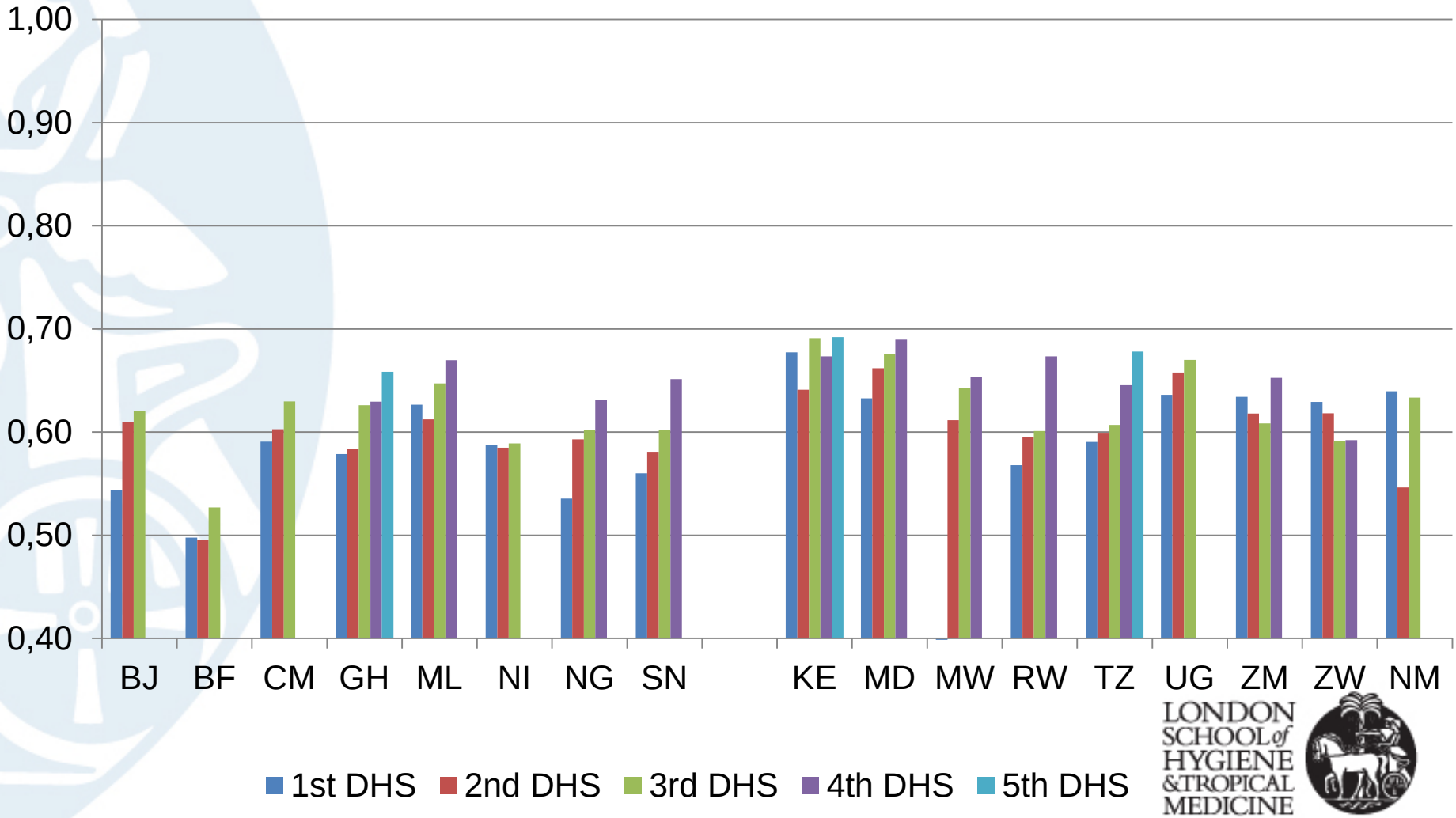


Recent sex by marital status

Proportions of women (15-39) who had sex in the last 28 days by marital



Index of postpartum infecundability



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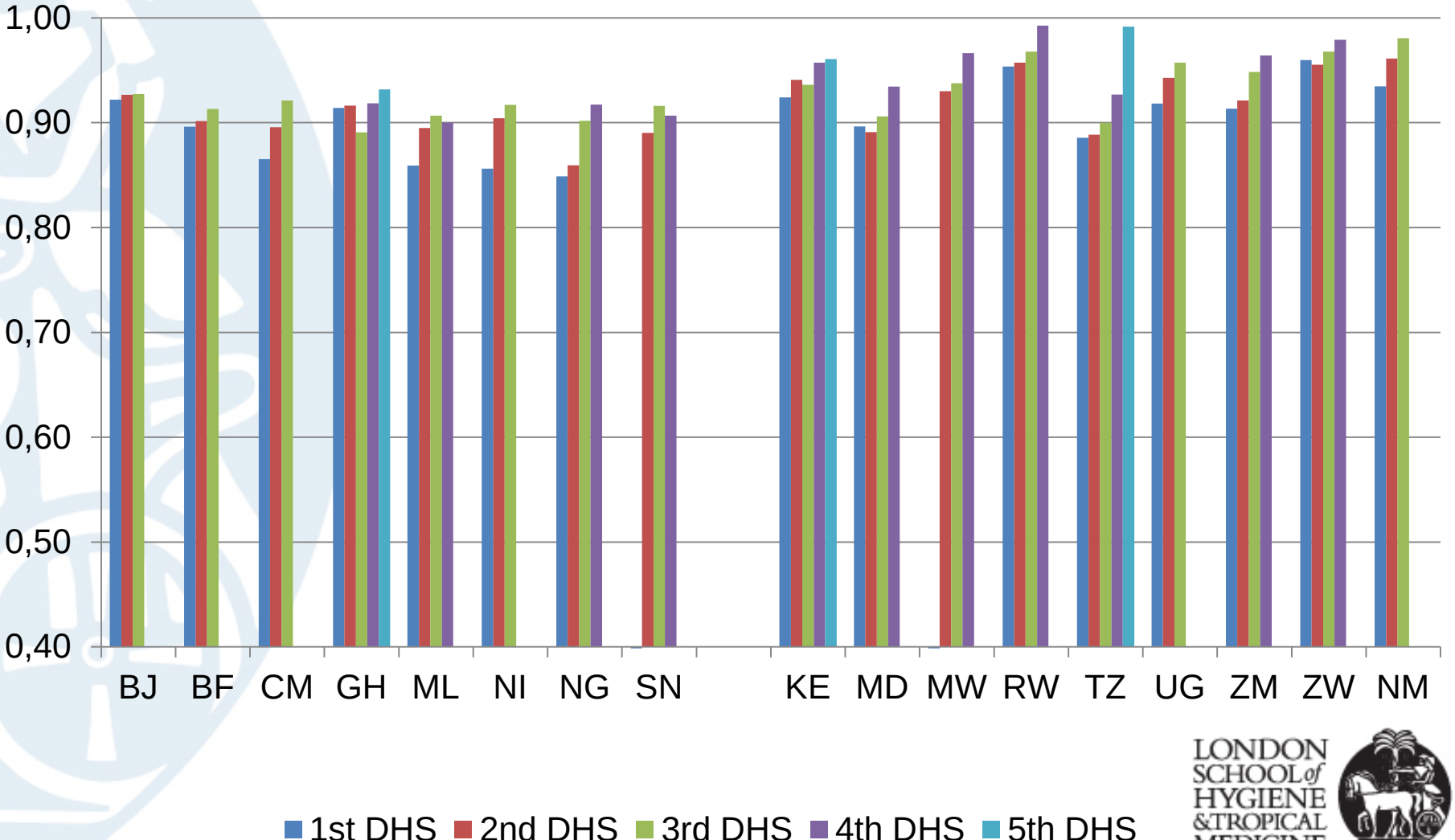
Index of infertility



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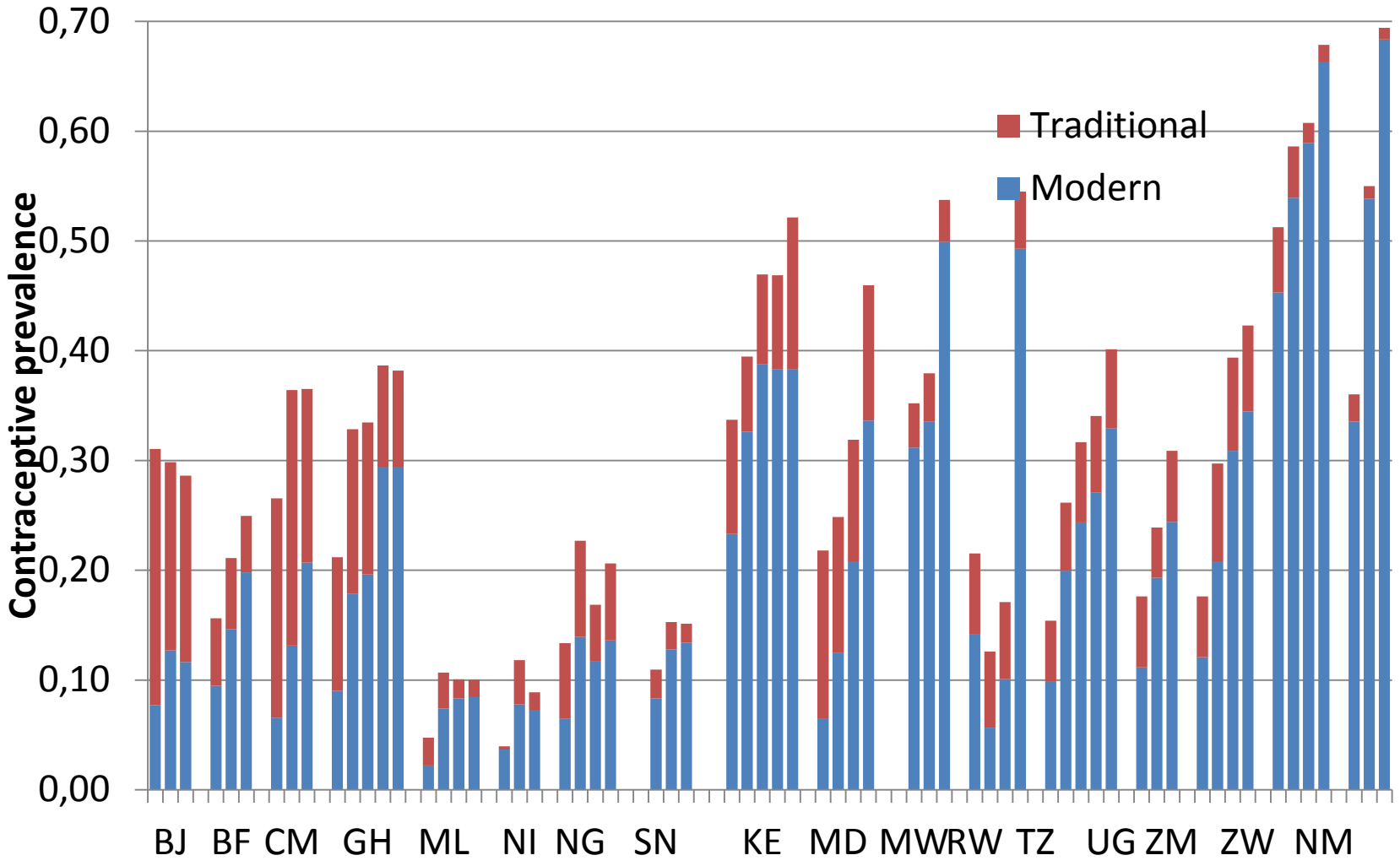
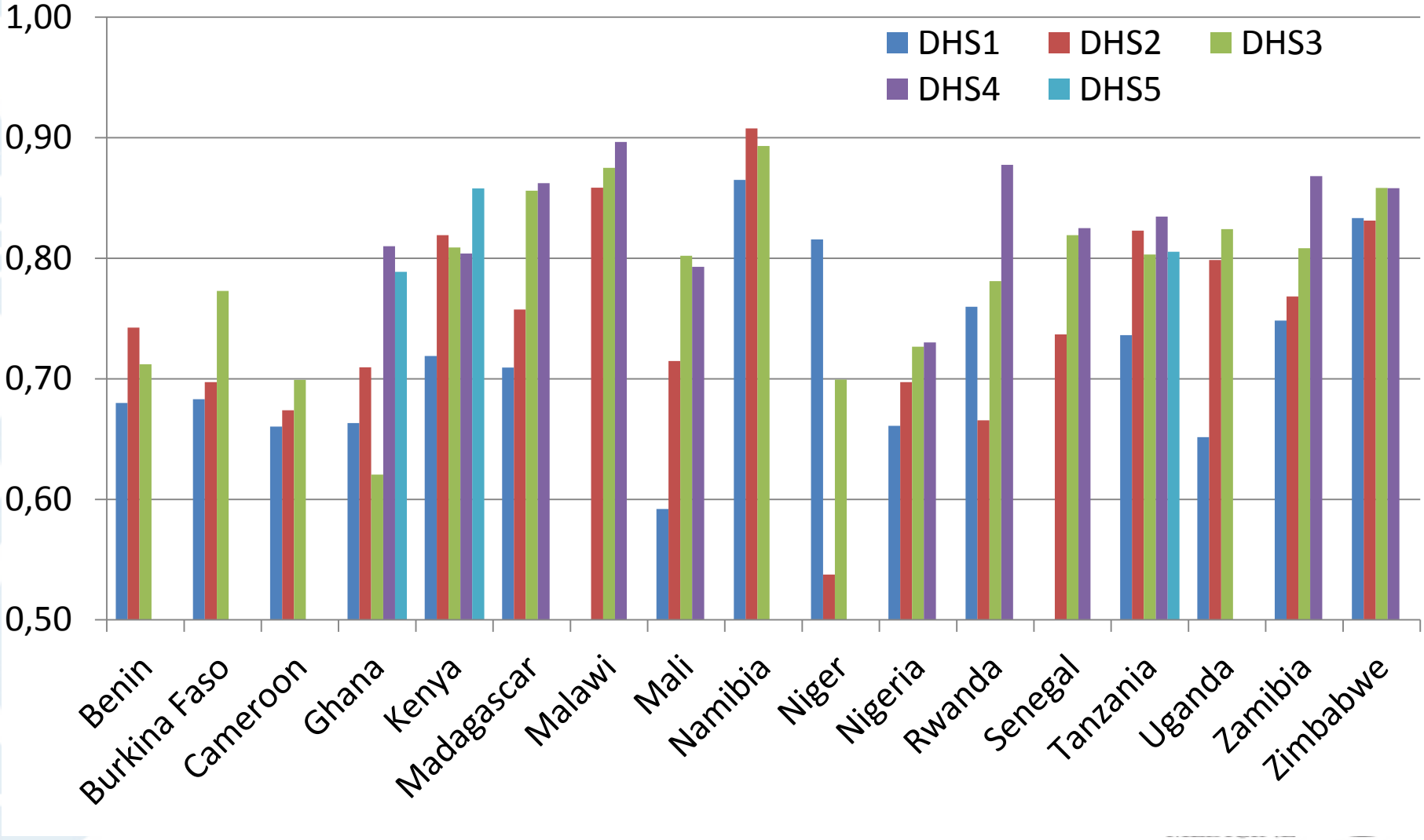
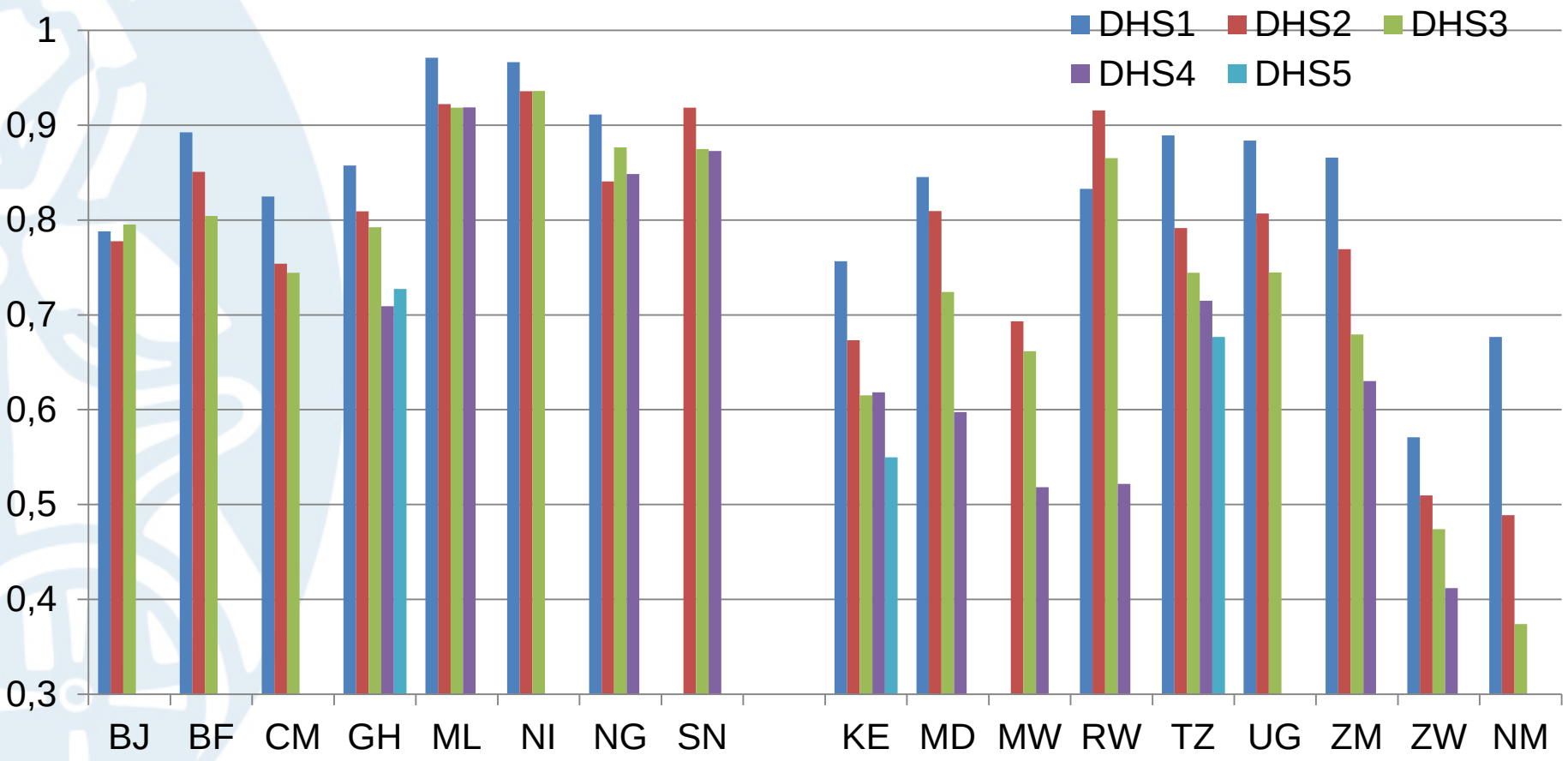
Contraceptive prevalence



Average effect of contraceptive



Index of contraception



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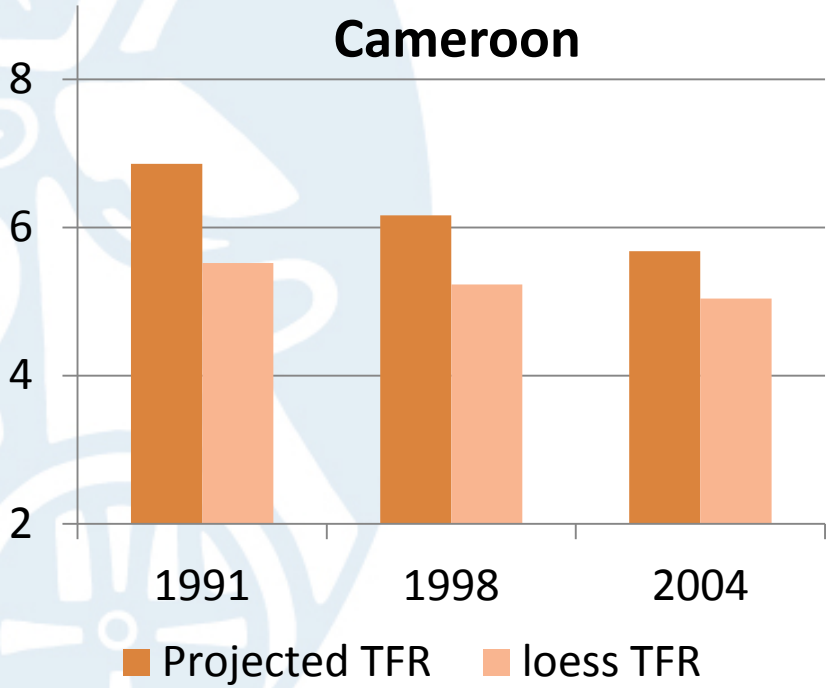
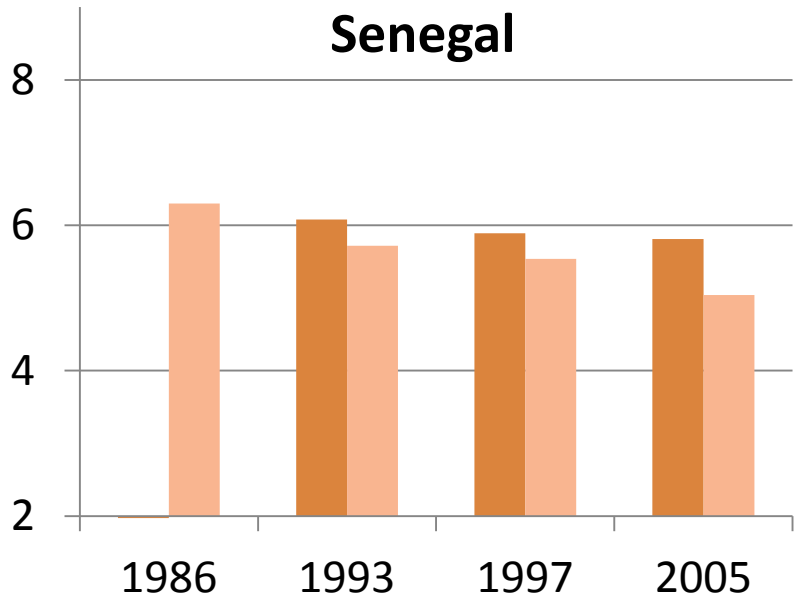
Projected vs Loess TFRs





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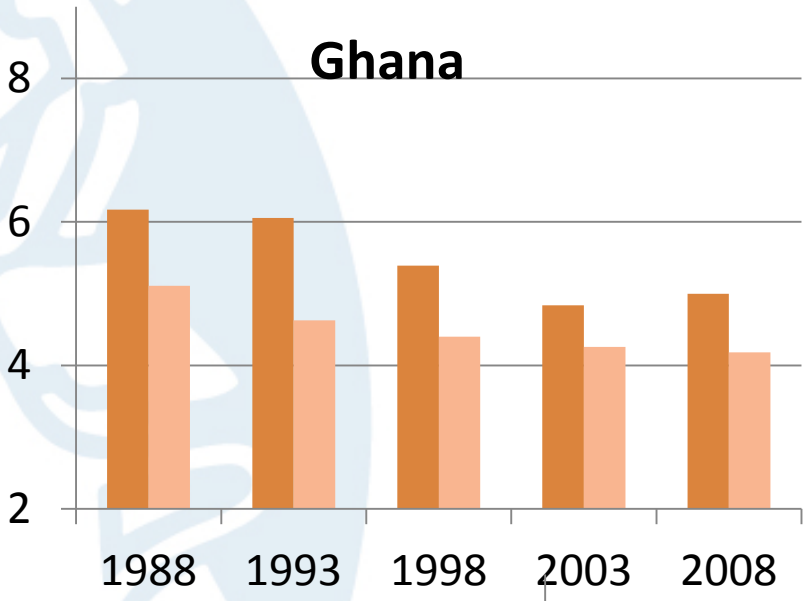
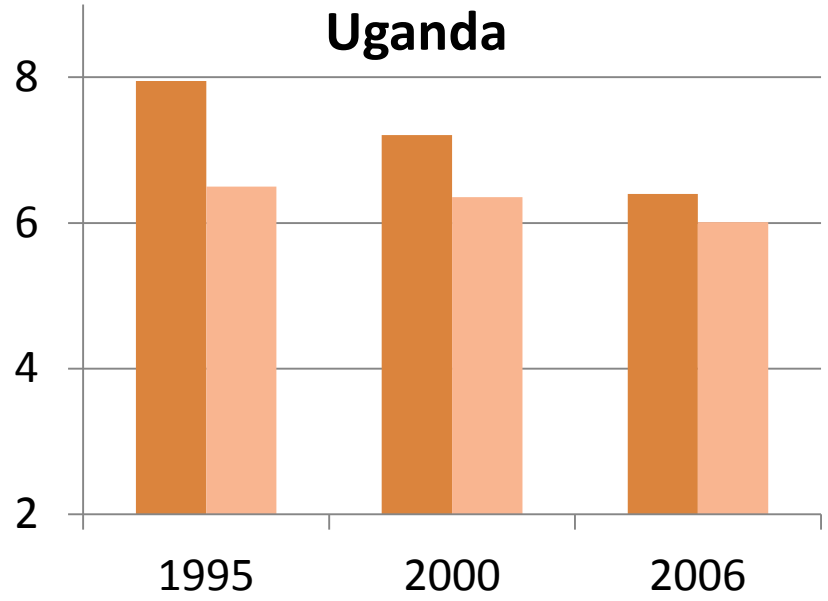
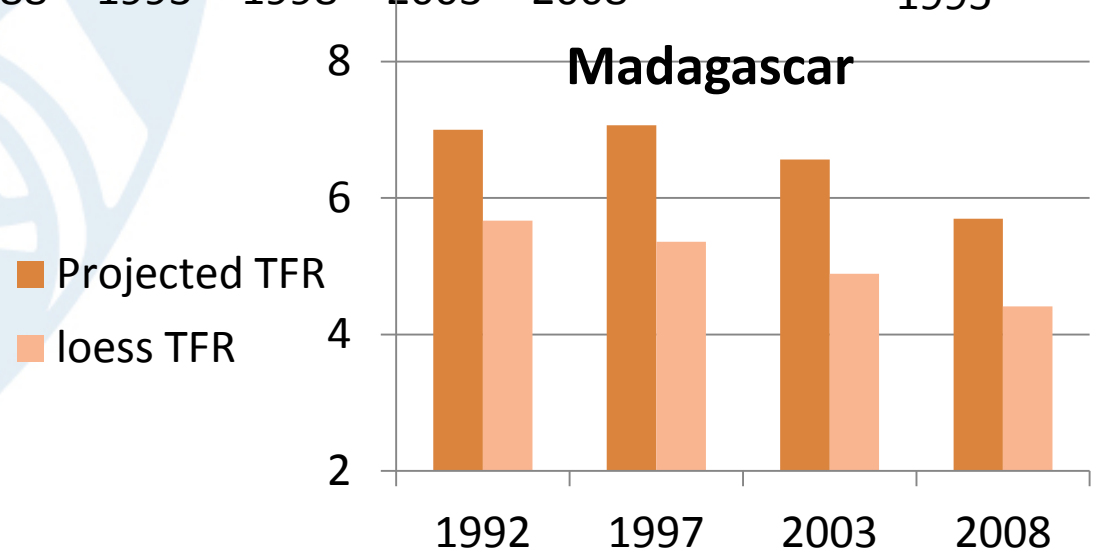
Projected vs Loess TFRs







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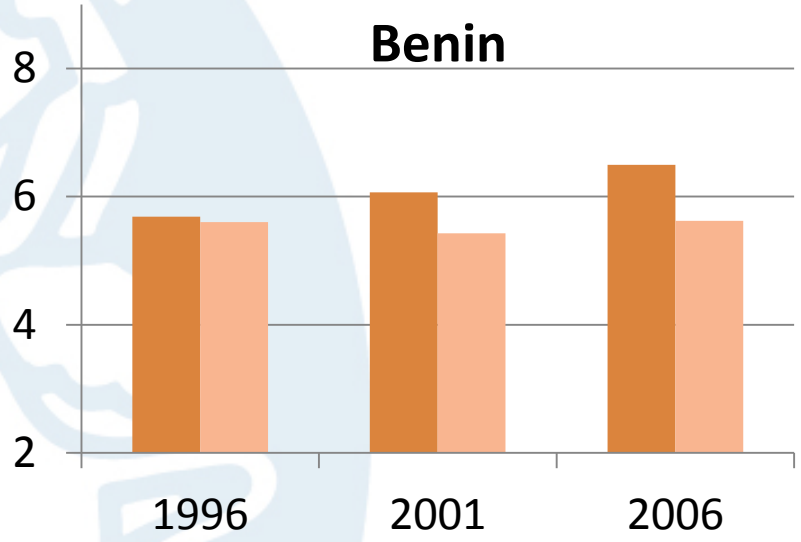
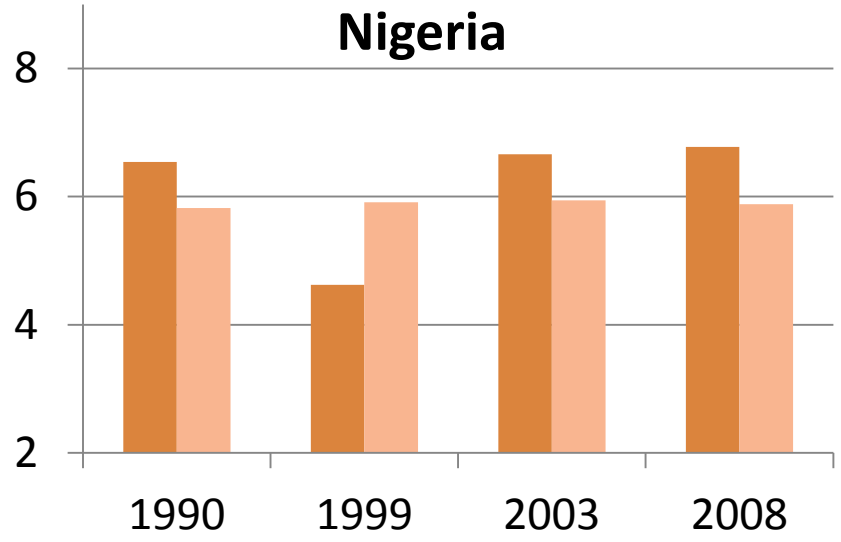
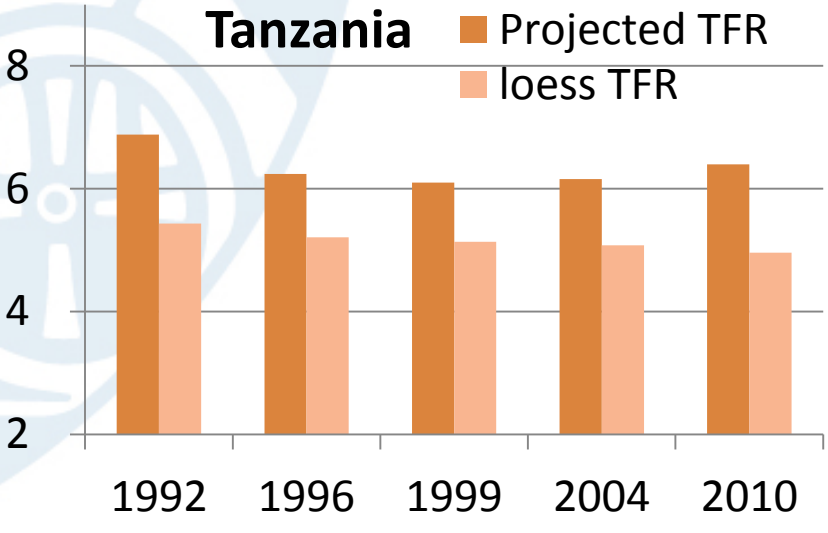
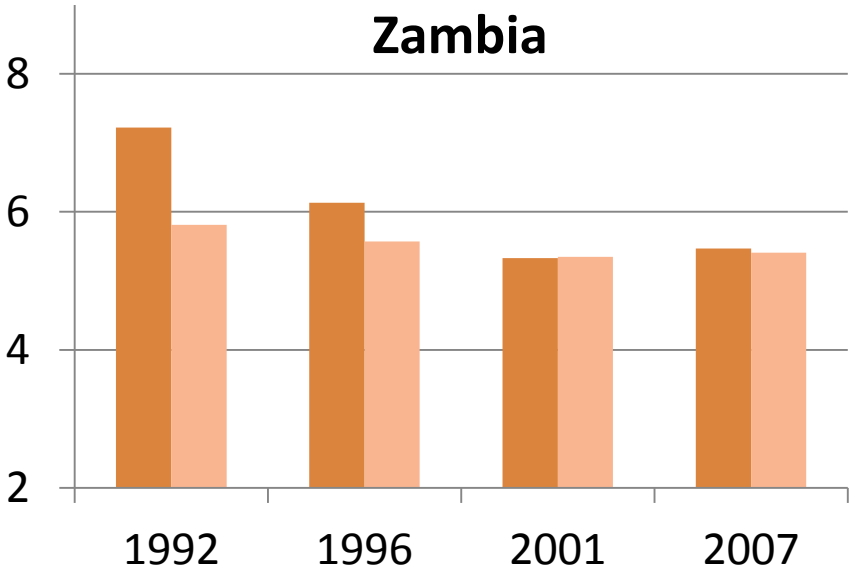
Projected vs Loess TFRs









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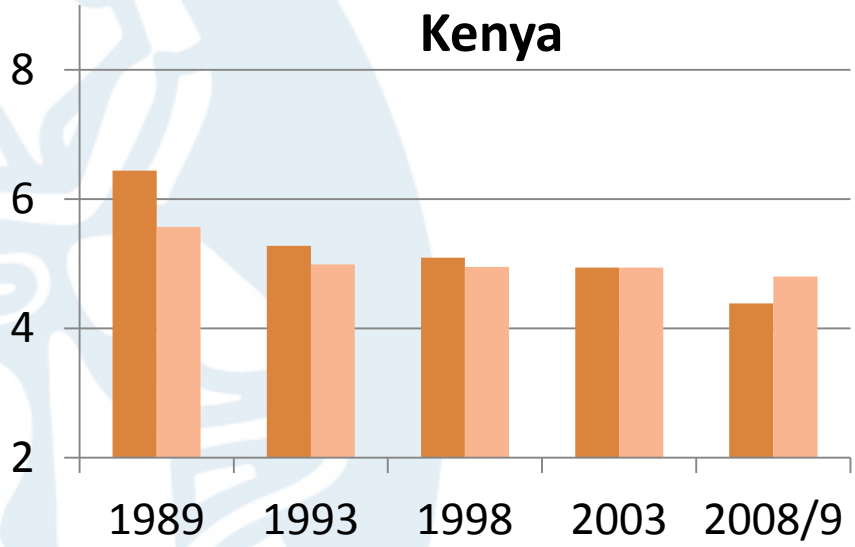

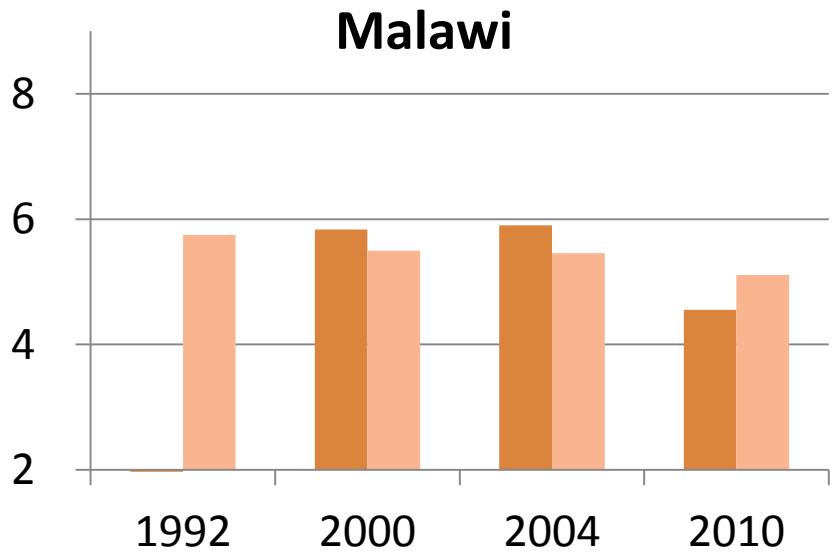

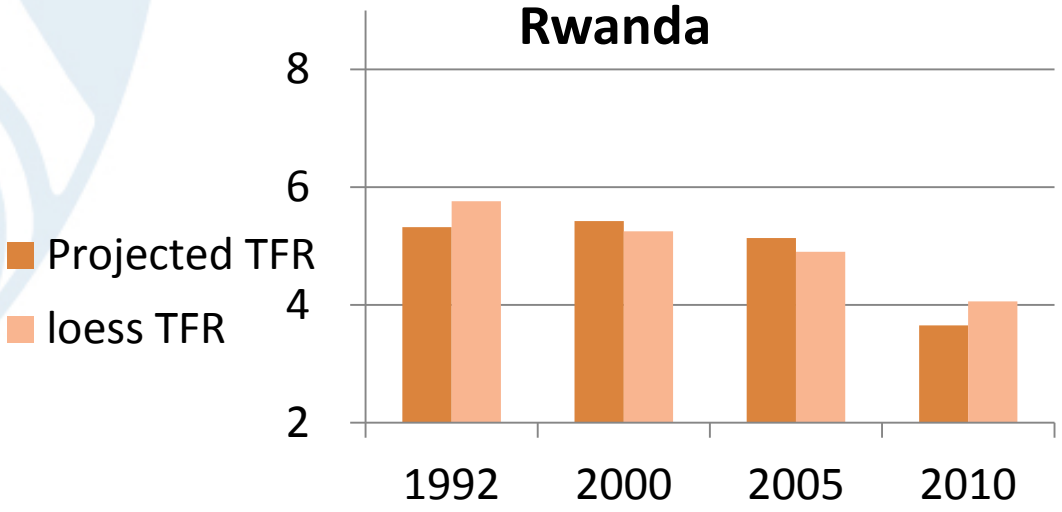

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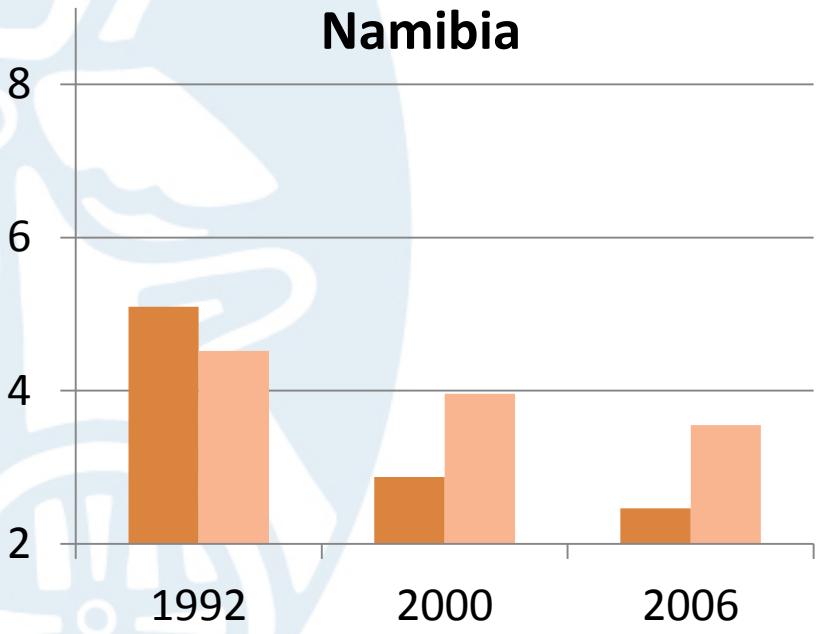
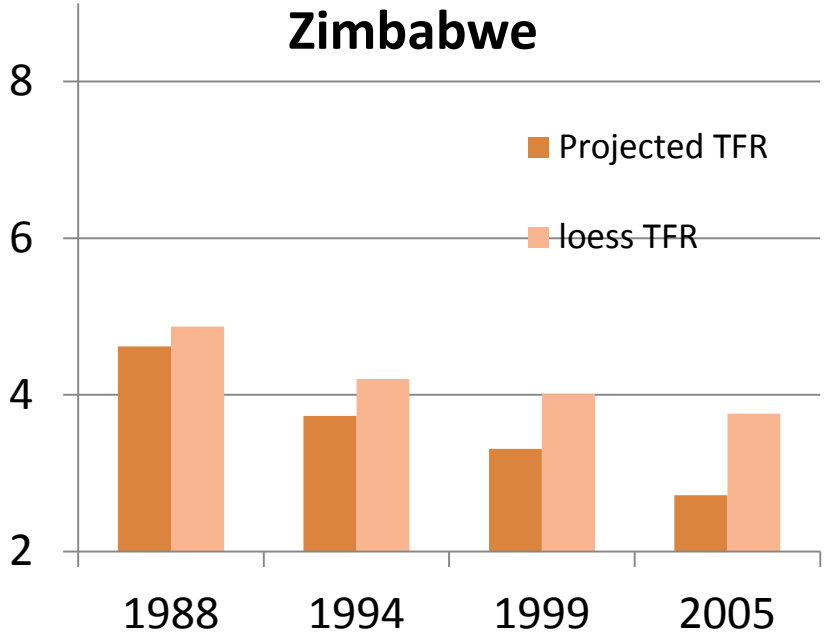
Projected vs Loess TFRs





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Summary: comparison (between 1985-95 and 1995-2005)

		Trends of projected TFR based on the proximate determinants framework		
		Increase	Deceleration/ No change	Decline
Trends of loess estimates	Deceleration	Benin Nigeria	Kenya Ghana Malawi Tanzania	Zimbabwe
	Acceleration/ Constant decline		Zambia	Burkina Faso Cameroon Madagascar Namibia Rwanda Senegal
	Pre-transition		Mali Niger	Uganda

Limitations

- The proximate determinants model is not intended to provide accurate estimates.
- There may be (more) biases and errors in proximate determinants data
- Because only the data at the time of the surveys were available, there are 3-5 point estimates on proximate determinants in each country to assess the trends. Description of the TFR trends has to rely on the slope between the two point estimates. The slope may be affected by different levels of data quality across the surveys.

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Discussion

- Overall, the TFR estimates based on the proximate determinants framework were consistent with the loess estimations. Specifically, the deceleration was supported by the changes in proximate determinants.

- The changes in each indicators significantly varied across the countries.
- The discrepancies in TFRs estimates between the projected and loess TFRs might be resulted from:
  (a) high contraceptive discontinuation rates
  (b) higher incidence of abortion
  (c) low or high proportion of unmarried women among all sexually active women (e.g. Namibia)

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Discussion

- Deceleration is likely to be resulted from:

  (a) stagnation of increase in contraceptive prevalence

  (b) decrease in duration of postpartum abstinence (and amenorrhea)

  (c) reduced sterility

- The proximate determinants model is useful to validate the observed/fitted TFRs. The revised model seem to reasonably capture the changes.

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Thank you!

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