

Web Appendix

Systematic assessment of the sex ratio at birth for all countries and estimation of national imbalances and regional reference levels

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List of Abbreviations

AMFB	Annual number of Missing Female Births
CMFB	Cumulative number of Missing Female Births
CV	Coefficient of Variation
DHS	Demographic and Health Survey
DSRB	Desired Sex Ratio at Birth
ENAN	the combination of countries in Europe, North America, Australia and New Zealand
GDP	Gross Domestic Product
LOESS	Local Polynomial Regression
MCMC	Markov chain Monte Carlo
SRB	Sex Ratio at Birth
SRLB	Sex Ratio at Last Birth
SRS	Sampling Registration System
TFR	Total Fertility Rate
UN IGME	United Nations Inter-agency Group for Child Mortality Estimation
VR	Vital Registration
WPP	World Population Prospect

1 Data

The sex ratio at birth (SRB) is defined as the ratio of male to female live births. Data on births by sex are recorded in vital registration (VR) systems, or in censuses or surveys. VR systems typically provide data on an annual basis, while censuses usually provide information for the previous 12 or 24 months. Surveys collect data on recent births or full birth histories from women of reproductive ages for longer retrospective periods from 5 to 20 years before the survey date.

1.1 Database

An overview of observations by data source type is in Table 1. There are 10,835 data points available from 202 countries¹. In total, there are 16,602 country-years of information available in our database. On average, 82.2 country-years of data are available for each of the 202 countries with data. Table 19 lists all data series by country.

Data Source Type	# Observations	# Country-Years
Census	48	48
DHS	2,257	5,413
Other DHS	1,392	3,662
Other	142	222
VR/SRS	6,996	7,257
Total	10,835	16,602

Table 1: **SRB observations by source type.** DHS: Demographic and Health Surveys. Other DHS refer to non-standard DHS, including Special, Interim and National DHS, Malaria Indicator Surveys, AIDS Indicator Surveys, World Fertility Surveys, Reproductive Health Survey, Multiple Indicator Cluster Surveys, Pan Arab Project for Family Health and Pan Arab Project for Child Development. VR: Vital Registration. SRS: sampling registration system.

1.2 Data Preprocessing

The SRB database summarized in Table 1 is based on multiple steps of data quality checking and pre-processing. In summary, we first calculate jackknife standard error for DHS and other DHS data and stochastic error for VR/SRS data, for every 1-year observation period based on micro-data. We then merge the observation period based on the coefficient of variation (CV) for log-transformed SRB. After merging, we apply inclusion and exclusion criteria.

1.2.1 Sampling Errors for Survey Data

We calculate jackknife estimate and sampling error for log-transformed SRB from DHS and other DHS data series. Let U denote the total number of clusters or primary sampling units. The u -th partial prediction of SRB observation from a certain country-specific survey with a certain reference year (year of birth) is given by:

$$r_{-u} = \frac{\sum_{n=1}^N \mathbb{I}(x_n = \text{male}; d_n \neq u) \cdot w_n}{\sum_{n=1}^N \mathbb{I}(x_n = \text{female}; d_n \neq u) \cdot w_n}, \text{ for } u = 1, \dots, U,$$

where n indexes the live births in the survey-year, N is the total number of live births for a particular survey-year. x_n , d_n and w_n refer to the sex, the cluster number and the sampling weight for the n -th live birth. Indicator $\mathbb{I}(\cdot) = 1$ if the condition inside the brackets is true, otherwise $\mathbb{I}(\cdot) = 0$. The u -th pseudo-value estimate of log-scaled SRB in a particular survey-year is:

$$\begin{aligned} \log(r)_u^* &= U \cdot \log(r) - (U - 1) \cdot \log(r_{-u}), \text{ where} \\ r &= \frac{\sum_{n=1}^N \mathbb{I}(x_n = \text{male}) \cdot w_n}{\sum_{n=1}^N \mathbb{I}(x_n = \text{female}) \cdot w_n}. \end{aligned}$$

¹We use the term “country” to refer to populations that are considered as countries or areas in the United Nations classification.

The jackknife standard error is:

$$\sigma_{JK} = \sqrt{\frac{\sum_{u=1}^U (\log(r)_u^* - \overline{\log(r)}^*)^2}{U(U-1)}}, \text{ where } \overline{\log(r)}^* = \frac{1}{U} \sum_{u=1}^U \log(r)_u^*.$$

The jackknife sampling error is replaced by its corresponding stochastic error (described below for VR/SRS data) if its stochastic variance is bigger than its jackknife counterpart. Most of such replacements are carried out to observations with the earliest reference date in data series, with small numbers of births.

1.2.2 Stochastic Errors for VR/SRS Data

For observations from VR/SRS, we use a Monte Carlo simulation to approximate the stochastic variance. For a country-year, the g -th simulated number of male live births $B^{M(g)}$ is obtained as:

$$B^{M(g)} \sim \mathcal{B}(B_{\text{rep}}, p_{\text{rep}}^M), \text{ for } g = 1, \dots, G,$$

where \mathcal{B} denotes a binomial distribution, G is the total number of simulations, B_{rep} is the total number of live births as reported in VR data, and p_{rep}^M is the reported proportion of male live births among the reported total live births. The corresponding g -th simulation for SRB is given by:

$$r^{(g)} = \frac{B^{M(g)}}{B_{\text{rep}} - B^{M(g)}}, \text{ for } g = 1, \dots, G.$$

The stochastic error for SRB on log-scale is:

$$\sigma_{ST} = \sqrt{\frac{1}{G-1} \sum_{g=1}^G (\log(r^{(g)}) - \overline{\log(r)})^2}, \text{ where } \overline{\log(r)} = \frac{1}{G} \sum_{g=1}^G \log(r^{(g)}).$$

1.2.3 Computation of Observation Periods

For data series from DHS, other DHS and VR/SRS, annual log-transformed SRB observations are merged such that the sampling or stochastic error is below 0.05. Annual observation are merged backward in time.

1.2.4 Inclusion and Exclusion Criteria

We apply the following inclusion and exclusion rules to all data:

1. Include data from countries with total population greater than 90,000 in 2017;
2. Exclude data from country-periods with war and other national-level crises recognized by the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) [71]. Data from one year after the crisis period are also excluded. Data from the following country-periods are excluded:
 - Armenia 1988–1989; Bosnia and Herzegovina 1992–1996; Brazil 2016–2017; Haiti 2010–2011; Honduras 1998–1999; Indonesia 2004–2005; Japan 2011–2012, 2015–2016; Kuwait 1991–1992; Libya 2011–2012; Maldives 2004–2005; Myanmar 2008–2009; Nicaragua 1998–1999; Rwanda 1993–2000; Samoa 2009–2010; Sri Lanka 2004–2005; Syria 2011–2017; Vanuatu 1997–1998; Venezuela 1999–2000.

For DHS and other DHS data series, we exclude observations with reference dates beyond 20 years prior the survey date due to potentially larger recall errors and truncation for older women compared to the recent reference periods.

Inclusion criteria for VR/SRS data for a given country are:

1. The earliest data point for reference year t to be included has to satisfy the following 3 criteria:

- (a) Its live birth completeness ratio $> 80\%$; AND
- (b) Its mean live birth completeness ratio within the period $[t - 2.5; t + 2.5] > 80\%$; AND
- (c) Its data reliability is either high or fair,

where

- The completeness ratio for a certain country-year is the ratio of the total number of live births from VR/SRS data to the total number of live births from the UN World Population Prospect (WPP) version 2017 [73].
- Data reliability is a measure of VR data provided by the UN Population Division, based on a qualitative assessment reported to the UN by the national authorities and/or an assessment by the UN Population Division analysts.

2. For a country belonging to the group of high income countries according to the World Bank 2014 country income classifications [77] and/or the group of developed countries as per Millennium Development Indicators of regional grouping [72], all data past the earliest included reference year are included. There are 76 countries:

- Albania; Andorra; Antigua and Barbuda; Arab Emirates; Aruba; Australia; Austria; Bahamas; Bahrain; Barbados; Belarus; Belgium; Bosnia and Herzegovina; Brunei; Bulgaria; Canada; Channel Islands; Chile; Croatia; Cyprus; Czech Republic; Denmark; Equatorial Guinea; Estonia; Finland; France; French Polynesia; Germany; Greece; Guam; Hong Kong, SAR of China; Hungary; Iceland; Ireland; Israel; Italy; Japan; Republic of Korea; Kuwait; Latvia; Lithuania; Luxembourg; Macao, SAR of China; Macedonia; Malta; Republic of Moldova; Monaco; Montenegro; Netherlands; New Caledonia; New Zealand; Norway; Oman; Poland; Portugal; Puerto Rico; Qatar; Romania; Russian Federation; Saint Kitts and Nevis; San Marino; Saudi Arabia; Serbia; Singapore; Slovakia; Slovenia; Spain; Sweden; Switzerland; Taiwan, Province of China; Trinidad and Tobago; United Kingdom; United States of America; Ukraine; Uruguay; United States Virgin Islands.

Additional VR exclusion rules are:

1. For countries with gross national product per capital < 500 US dollar (as of 1973) based on the World Bank 1973 country income classification [19, 76], we exclude all data with reference years before 1970, regardless of data reliability or completeness. Based on this rule, 21 countries have their VR data excluded before 1970:

- Albania; Antigua and Barbuda; Cape Verde; Dominica; Egypt; El Salvador; Grenada; Guyana; Jordan; Macao, SAR of China; Maldives; Mauritius; Saint Kitts and Nevis; Saint Lucia; Samoa; Sao Tome and Principe; Seychelles; Sri Lanka; Saint Vincent and the Grenadines; Tonga; Tunisia.

2. We exclude VR data during colonial periods for African countries because these assessments do not include the African population during those periods. The VR data points are excluded for the following country-periods:

- (a) Equatorial Guinea: before and inclusive of 1968;
- (b) Guinea-Bissau: before and inclusive of 1973;
- (c) Mozambique: before and inclusive of 1975;
- (d) Sao Tome and Principe: before and inclusive of 1975.

3. We exclude VR data before 1980 from the Republic of Korea due to low VR data quality [11, 37].

4. We exclude VR data in 2008 from Georgia since the armed conflict resulted in deficient registration [74].

1.2.5 China and India Data Cleaning and Adjustment

Due to the important and documented data issues of SRB in China and India [24, 46], we conduct additional data quality assessment and adjustment for data from the two countries.

China data We exclude observations with reference dates beyond 20 years of the survey date for the following two surveys:

- 1982 National One-per-Thousand-Population Sample Survey on Fertility;
- 1988 National Two-per-Thousand-Population Sample Survey on Fertility and Contraceptives.

The two surveys recorded full birth histories of a large sample of married women (311,000 age 15-67 in the 1982 survey, and 459,000 age 15-57 in the 1988 survey). Including the more recent data can reduce potential greater recall biases and excessive omission of female births [14].

We exclude the 2000 Chinese Longitudinal Healthy Longevity Survey. The reason to exclude this data series is because the birth histories are reported by females age 80 years and above from 22 provinces in China [81]. The earlier female births may be omitted more often than male births.

To reduce the data bias from excess female births underreporting in China, we treat the Education Statistics as more informative compared to survey and census data in China. We assign 0.01 as the sampling error for the education administration records and 0.044 to the rest China data (the default value imputed for all data without sampling errors, see Section 2.3). We do not include a bias term to adjust the non-education statistics data in China because those data are not consistently above the Education Statistics (Figure 7).

India data We add in additional uncertainty to account for underreporting of birth in SRB data from India Sampling Registration System (SRS). For a certain year, p_{und} is the corresponding period-specific average underreporting rate for the total births. B_{und} and B_{rep} denote the total number of births that is underreported and the total number of births that is reported in the SRS respectively. B_{rep}^M and B_{rep}^F are the reported number of male and female births in the SRS respectively. The total number of underreported births is: $B_{\text{und}} = B_{\text{rep}} \cdot [p_{\text{und}} / (1 - p_{\text{und}})]$. We assume that the proportion of underreported female births is between 0 and 1 of the total number of underreported births. Let \mathcal{U} denotes a uniform distribution and $B_{\text{und}}^{F(g)}$ be the g -th simulated number of underreported female births:

$$\begin{aligned} B_{\text{und}}^{F(g)} &\sim \mathcal{U}(0, 1) \cdot B_{\text{und}}, \text{ for } g = 1, \dots, G, \\ B_{\text{und}}^{M(g)} &= B_{\text{und}} - B_{\text{und}}^{F(g)}. \end{aligned}$$

The stochastic uncertainty of the reported sex-specific birth is simulated as below:

$$\begin{aligned} B_{\text{rep}}^{F(g)} &\sim \mathcal{B}\left(B_{\text{rep}}, \frac{B_{\text{rep}}^{F(g)}}{B_{\text{rep}}} \right), \text{ for } g = 1, \dots, G, \\ B_{\text{rep}}^{M(g)} &= B_{\text{rep}} - B_{\text{rep}}^{F(g)}. \end{aligned}$$

The final uncertainties of India SRS data for SRB on log-scale take into account both the stochastic error from reported births and the uncertainty due to birth underreporting:

$$\begin{aligned} r_{\text{SRS}}^{(g)} &= \frac{B_{\text{rep}}^{M(g)} + B_{\text{und}}^{M(g)}}{B_{\text{rep}}^{F(g)} + B_{\text{und}}^{F(g)}}, \text{ for } g = 1, \dots, G. \\ \text{final uncertainty} &= \sqrt{\frac{1}{G-1} \sum_{g=1}^G \left(\log(r_{\text{SRS}}^{(g)}) - \overline{\log(r_{\text{SRS}})} \right)^2}, \text{ where } \overline{\log(r_{\text{SRS}})} = \frac{1}{G} \sum_{g=1}^G \log(r_{\text{SRS}}^{(g)}). \end{aligned}$$

Table 2 lists the reported SRB from India SRS during 1982–2016 and two types of uncertainties: 1) original error: only stochastic error based on reported sex-specific birth; and 2) adjusted error: both stochastic error and uncertainty due to underreporting of births, which is used for model input.

Reference Year	Reported SRB (India SRS)	Underreporting Rate (for Total Birth)	Stochastic Error	
			Original	Adjusted
1982	1.090	6.5%	0.0045	0.0744
1983	1.099	6.5%	0.0045	0.0746
1984	1.104	6.5%	0.0045	0.0763
1985	1.095	6.5%	0.0045	0.0736
1986	1.096	6.5%	0.0045	0.0750
1987	1.098	6.5%	0.0046	0.0750
1988	1.099	6.5%	0.0047	0.0752
1989	1.096	6.5%	0.0048	0.0760
1990	1.098	6.5%	0.0047	0.0759
1991	1.111	1.6%	0.0048	0.0197
1992	1.119	1.6%	0.0048	0.0199
1993	1.130	1.6%	0.0049	0.0199
1994	1.138	1.6%	0.0048	0.0197
1995	1.133	1.6%	0.0049	0.0205
1996	1.122	1.6%	0.0050	0.0200
1997	1.110	1.6%	0.0049	0.0199
1998	1.114	1.6%	0.0049	0.0204
1999	1.119	1.6%	0.0051	0.0196
2000	1.121	1.6%	0.0051	0.0189
2001	1.121	2.7%	0.0050	0.0315
2002	1.134	2.7%	0.0050	0.0310
2003	1.136	2.7%	0.0050	0.0311
2004	1.121	2.7%	0.0050	0.0323
2005	1.110	2.7%	0.0050	0.0317
2006	1.106	2.7%	0.0050	0.0318
2007	1.104	2.7%	0.0050	0.0314
2008	1.105	2.7%	0.0050	0.0325
2009	1.070	2.7%	0.0050	0.0319
2010	1.090	2.7%	0.0050	0.0312
2011	1.101	2.7%	0.0050	0.0317
2012	1.100	2.7%	0.0050	0.0320
2013	1.101	2.7%	0.0049	0.0318
2014	1.104	2.7%	0.0050	0.0324
2015	1.111	2.7%	0.0050	0.0319
2016	1.114	2.7%	0.0051	0.0324

Table 2: **Reported SRB and adjusted uncertainty for India SRS, 1982–2016.** Average underreporting rate of total birth for India SRS is 6.5% during 1982–1990 [7], 1.6% during 1991–2000 [78] and 2.7% during 2001–2010 [78]. Average underreporting rate of total birth for India SRS after 2010 is assumed to be 2.7%. Original and adjusted errors are for SRB on log-scale.

2 Method

We model the true SRB $R_{c,t}$ for country c in year t without SRB inflation as:

$$R_{c,t} = \beta_c \cdot P_{c,t}, \quad (1)$$

where β_c is the national baseline for country c in the absence of prenatal sex discrimination and sex-selective abortion. $P_{c,t}$ is the divergence from the baseline under natural circumstances.

If SRB is inflated in country c in year t , the true level of SRB $R_{c,t}$ is modeled as:

$$R_{c,t} = \beta_c \cdot P_{c,t} + \alpha_{c,t}, \quad (2)$$

where the additional term $\alpha_{c,t}$ is assumed to be non-negative in order to capture the inflated SRB levels that deemed to be due to sex-selective abortion as opposed to natural fluctuations.

The following subsections explain the steps to estimate $R_{c,t}$:

- Step 1 (Section 2.1): Select countries in which SRB inflation is possible to happen, referred to as countries at risk of SRB inflation;
- Step 2 (Section 2.2): Model SRB $R_{c,t}$ without inflation based on a reduced database (obtained by excluding data after 1970 from the selected countries at risk of SRB inflation);
- Step 3 (Section 2.3): Model SRB $R_{c,t}$ with inflation factor $\alpha_{c,t}$ for countries at risk of SRB inflation.

2.1 Step 1: Selection of Countries at Risk of SRB Inflation

The selection criteria of countries at risk of SRB inflation are:

1. Desired sex ratio at birth is high (Section 2.1.1, Table 13);
2. Sex ratio at last birth is high (Section 2.1.2, Table 15);
3. Literature suggests inflated SRB or reports on son preference or patrimonial society (Section 2.1.3).

A total of 29 countries satisfy at least one of the aforementioned criteria. These countries are considered at risk of SRB inflation.

Information on the three criteria is available for 90 out of 212 countries considered in this study. Among the remaining 122 countries without information on any criterion, we identify 65 countries with time series of VR data that cover the period 1970–2017, defined by countries with at least five VR data points in the periods 1970–1985, 1986–2000, 2001–2017. Given the coverage of VR data for those countries, we assume that SRB inflation would have been studied and discussed in the literature. Given that no literature has been found on son preference and/or SRB inflation for those countries, we assume that these 65 countries with VR coverage were not at risk of SRB inflation for the period 1970–2017.

Finally, there are 57 countries without information on SRB inflation risk, covering 3.2% of all birth globally. We assume no SRB imbalance for those countries and associated births. This may result in lack of identification of SRB imbalances in this set of countries and hence, 3.2% of all birth globally in 1970–2017.

In summary, out of 212 countries considered, there is information on any one of the three criteria for 90 countries, VR coverage for 65 countries and no information for 57 countries, covering 3.2% of all births globally. The categorization of countries is summarized in Table 18. The rest of this subsection provides more details about the three criteria.

2.1.1 Computation of Desired Sex Ratio at Birth

We compute the desired sex ratio at birth (DSRB) for all DHS data where relevant information is available for their corresponding surveys. 220 DHS surveys from 73 countries collected information on the number of desired female and

Country	(1) High DSRB	(2) High SRLB	(3) Literature Review [Reference]
Afghanistan	✓		
Albania		✓	[26]
Armenia		✓	[16, 27, 49]
Azerbaijan		✓	[16, 27, 49]
Bangladesh	✓		[4, 12]
China			[28, 30, 31]
Egypt	✓	✓	[3, 17, 61, 79, 80]
Gambia	✓		
Georgia			[16, 27, 49]
Hong Kong, SAR of China			[5]
India	✓	✓	[26, 28, 64]
Jordan	✓	✓	
Korea, Republic of			[27, 56]
Mali	✓		
Mauritania	✓		
Montenegro			[26]
Morocco			[61]
Nepal	✓	✓	[20, 32, 38, 41]
Nigeria			[50, 53]
Pakistan	✓	✓	[27]
Senegal	✓	✓	[39]
Singapore			[25, 70]
Taiwan, Province of China			[40, 42]
Tajikistan		✓	
Tanzania		✓	[51]
Tunisia			[61]
Turkey		✓	[2]
Uganda			[6]
Vietnam		✓	[29]

Table 3: **Countries at risk of SRB inflation.** DSRB: desired sex ratio at birth. SRLB: sex ratio at last birth. Selection criteria (1) high DSRB: explained in Section 2.1.1; (2) high SRLB: explained in Section 2.1.2; (3) literature review: explained in Section 2.1.3.

male births for interviewed households in female questionnaires. We only include female respondents below age 35 as suggested in [8]. To allow the DSRB comparable across countries over time, we do not calculate the DSRB from the male questionnaires since much fewer DHS have both male and female questionnaires than have female questionnaire only. If a female responded no preference of the desired sex of the child, we assume the desired numbers of female and male children are the same and equal to half of the total desired number of children for that household. The reference year of DSRB for each DHS survey is the midpoint of the fieldwork of a survey.

A country is identified to have high DSRB if at least one DSRB is above 120 desired male births per 100 desired female births (cutoff value is suggested in [8]). Table 13 lists 11 countries identified with high DSRB. Table 14 lists 62 countries with DSRB data but are not selected to have high DSRB.

2.1.2 Computation of Sex Ratio at Last Birth

We compute the sex ratio at last birth (SRLB) for all the DHS data series where information on birth order and whether a woman desires no more children is available. The SRLB information can be generated from 283 DHS series from 83 countries. We compute SRLB for women who do not want any more children and compute the sex ratio of their most recent birth (that is, with the highest birth order). We use CV at 0.1 as a cut-off to merge single reference years and the maximum merged period is 5 years.

A country is considered having high SRLB if at least two SRLB is above 130 male births per 100 female births (cutoff value is suggested in [8]). We only consider SRLB data less than 20 years prior the survey with CV below 0.2. 13 countries are identified with high SRLB (Table 15) and 70 countries are not identified to have high SRLB (Table 16).

2.1.3 Literature Review

We conducted a systematic literature review on February 22, 2017 to find articles to identify countries at risk of SRB inflation. We searched on PubMed and Scopus with the following search terms:

1. Pubmed
 - search term: “sex selective abortion”;
 - number of articles found: 416;
2. Scopus
 - search term: “son preference” OR “patrimonial society”;
 - number of articles found: 526.

2.2 Step 2: Model of SRB without Inflation and Estimation of SRB Baselines

In the first step of modeling, parameters that are not related to prenatal gender discrimination and sex-selective abortion are estimated. In order to do that, we use a reduced SRB database by excluding SRB observations that may be affected by prenatal sex discrimination and sex-selective abortion. The excluded data points are from the 29 countries at risk of SRB inflation listed in Table 3 from reference year 1970 onward. We assume that the true SRB for countries at risk of SRB inflation before 1970 and all the other country-years are the product of two components:

$$R_{c,t} = \beta_c \cdot P_{c,t}.$$

We model the national baseline β_c to follow a hierarchical distribution with mean at its corresponding regional baseline $N_{r[c]}$. Let \mathcal{N} denotes a normal distribution:

$$\log(\beta_c) \sim \mathcal{N}(\log(N_{r[c]}), \sigma_\beta^2).$$

The hierarchical structure for national baseline β_c is to account for ethnicity difference across countries within the same region $r[c]$. The regional baseline N_r is to capture the ethnic variations in SRB among regions [35, 48]. We assume that the national baseline β_c and regional baseline N_r are constant over time. We assign independent uniform prior to each N_r and vague prior to σ_β :

$$\begin{aligned} N_r &\stackrel{i.i.d.}{\sim} \mathcal{U}(1, 1.1), \text{ for } r = 1, \dots, R, \\ \sigma_\beta &\sim \mathcal{U}(0, 0.05). \end{aligned}$$

The multiplier $P_{c,t}$ is estimated by a time series model with an auto-regressive of order 1 structure. For countries without any data or with limited information, $P_{c,t}$ fluctuates around one, such that the estimated SRB without prenatal gender discrimination is given by β_c . For countries where data suggest different levels or trends, $P_{c,t}$ captures these deviations from β_c :

$$\begin{aligned} \log(P_{c,t}) &\sim \mathcal{N}(0, (1 - \rho^2)/\sigma_\epsilon^2), \text{ for } t = 1950, \\ \log(P_{c,t}) &= \rho \cdot \log(P_{c,t-1}) + \epsilon_{c,t}, \text{ for } t = 1951, \dots, 2017, \\ \epsilon_{c,t} &\stackrel{i.i.d.}{\sim} \mathcal{N}(0, \sigma_\epsilon^2). \end{aligned}$$

Vague priors are assigned to ρ and σ_ϵ :

$$\begin{aligned} \rho &\sim \mathcal{U}(0, 1), \\ \sigma_\epsilon &\sim \mathcal{U}(0, 0.05). \end{aligned}$$

Data quality model The data quality model for the i -th observed SRB r_i is:

$$\log(r_i) \sim \mathcal{N}\left(\log(R_{c[i],t[i]}), \sigma_i^2 + \omega_{s[i]}^2\right). \quad (3)$$

σ_i is sampling error (for non-VR data) or stochastic error (for VR/SRS data) for the i -th observation. It is set to a minimum of 1% except for the 76 high-income developed countries identified in Section 1.2.4 the 2nd inclusion criterion. We impute the missing sampling error as the median of available sampling errors for non-VR data. The imputed sampling error for the model without SRB inflation is 0.045. $\omega_{s[i]}$ is the non-sampling error, where $s[i]$ refers to the source type of the i -th observation, where source types are listed in Table 1. The prior $\mathcal{U}(0, 0.5)$ is assigned to each ω_s . For VR/SRS data, we assume that the non-sampling variance is zero.

2.3 Step 3: Model of SRB with Inflation

We estimate $R_{c,t}$ for the 29 countries at risk of SRB inflation listed in Table 3. We model SRB $R_{c,t}$ for country c , year t as:

$$R_{c,t} = \beta_c \cdot P_{c,t} + \alpha_{c,t}.$$

In the model fitting, we use the posterior medians of ρ , σ_ϵ (to get $P_{c,t}$), national baseline β_c and non-sampling error ω_s from step 2 in Section 2.2.

$\alpha_{c,t}$ is the upward inflation factor for country c in year t to capture higher SRB levels that may be due to sex-selective abortion. It is modeled from 1970 onward for the 29 countries where gender discrimination may be present and where a son preference may have led or may lead to prenatal gender discrimination once fertility declines and sex selective technology becomes accessible [26]. We parameterize the sex ratio transition using a trapezoid to represent consecutive phases of increase, stagnation and decrease back to zero (Figure 1). Parameters are estimated with a Bayesian hierarchical model [22, 43] to share information across countries on the start year of the inflation $t_{c,0}$, the maximum inflation a_c , and the lengths of the inflation period during the three phases as $d_{c,1}$, $d_{c,2}$ and $d_{c,3}$.

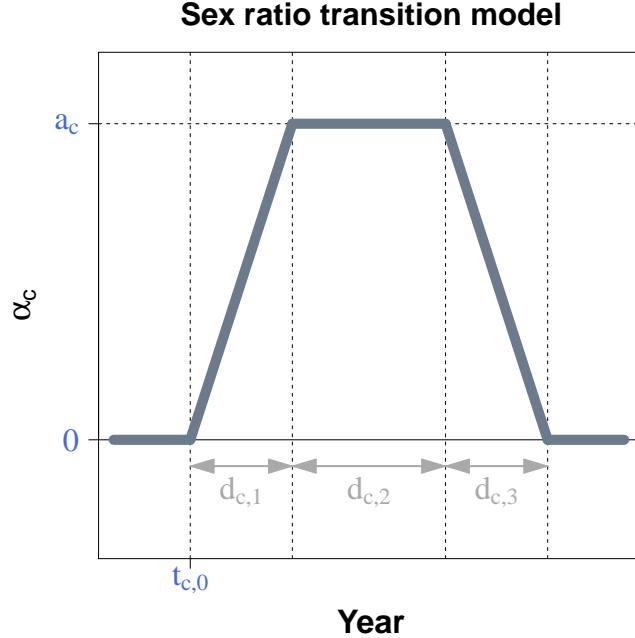


Figure 1: **Illustration of sex ratio transition model.** All parameters are for country c . $t_{c,0}$: start year of SRB inflation. $d_{c,1}$, $d_{c,2}$ and $d_{c,3}$: period lengths of the SRB inflation phases of increase, stagnation and decrease back to zero. a_c : maximum value of the inflation.

The inflation factor $\alpha_{c,t}$ is modeled as:

$$\alpha_{c,t} = \begin{cases} (a_c/d_{c,1}) \cdot (t - t_{c,0}), & t_{c,0} < t < t_{c,0} + d_{c,1} \\ a_c, & t_{c,0} + d_{c,1} < t < t_{c,0} + \sum_{m=1}^2 d_{c,m} \\ a_c - (a_c/d_{c,3}) \cdot (t - t_{c,0}), & t_{c,0} + \sum_{m=1}^2 d_{c,m} < t < t_{c,0} + \sum_{m=1}^3 d_{c,m} \\ 0, & t < t_{c,0} \text{ or } t > t_{c,0} + \sum_{m=1}^3 d_{c,m} \end{cases}$$

a_c , $d_{c,m}$ ($m = 1, 2, 3$) and $t_{c,0}$ follow truncated distributions with hierarchical structures:

$$\begin{aligned} a_c &\sim \mathcal{N}(\mu_{ac}, \sigma_{ac}^2) T(0,), \\ d_{c,m} &\sim \mathcal{N}(\mu_{dm}, \sigma_{dm}^2) T(0,), \text{ for } m = 1, 2, 3, \\ t_{c,0} &\sim t(t_{c,\eta}, \sigma_\eta^2, v = 3) T(t_{c,\eta},). \end{aligned}$$

t denotes a Student- t distribution. The choice of the distribution for start year $t_{c,0}$, the calculations for the mean of the distribution $t_{c,\eta}$ and the lower truncation $t_{c,\eta}6$ are explained in Section 2.3.1.

Vague priors are assigned to hierarchical mean and variance parameters:

$$\begin{aligned} \sigma_{\eta_c} &\sim \mathcal{U}(0, 10), \\ \mu_{ac} &\sim \mathcal{U}(0, 2), \\ \mu_{dm} &\sim \mathcal{U}(0, 40), \text{ for } m = 1, 2, 3, \\ \sigma_{dm} &\sim \mathcal{U}(1, 10), \text{ for } m = 1, 2, 3, \\ \sigma_{ac} &\sim \mathcal{U}(0, 2). \end{aligned}$$

Data quality model The data quality model for SRB with inflation factor follows the same structure as the data model [3] without SRB inflation factor. The only difference is that the imputed sampling error for the model with SRB inflation is 0.044.

2.3.1 Inflation Start Year

To inform the start year of the SRB inflation period, we incorporate the fertility squeeze effect into the model. The fertility squeeze is approximated by the total fertility rate (TFR) from the UN World Population Prospects (WPP) 2017 [73]. The start year distribution $t_{c,0}$ follows a truncated Student- t distribution with degree of freedom 3 to allow start year estimated in years with outlying TFR (e.g. very low TFR in Vietnam and very high TFR in India).

$$t_{c,0} \sim t(t_{c,\eta}, \sigma_\eta^2, v = 3)T(t_{c,\eta 6},).$$

Mean of the inflation start year distribution In the hierarchical distribution for start year parameter $t_{c,0}$, the mean is equal to the year where the TFR in country c decreases to a certain value η (i.e. same across countries) in country-specific year $t_{c,\eta}$. The TFR value η and the country-specific year $t_{c,\eta}$ are computed as:

1. Among the countries at risk of SRB inflation, select those countries with high quality data, here quantified by those countries with mean sampling or stochastic error for log-transformed SRB at most 0.02. This resulted in a selection of eight countries (Table 4).
2. For each of the eight countries, if there are five consecutive VR/SRS data points greater than the posterior median estimate from the non-inflation model (Section 2.2), the start year for that country is given by the year preceding those five VR/SRS observations. We then extract the country-specific TFR value η_c that corresponded to that start year (Table 4).
3. The global TFR value $\eta = 2.9$, is the median of the country-specific TFR values.

Given η , the $t_{c,\eta}$ s for all countries at risk of SRB inflation are computed by extracting the year with the TFR value closest to η .

Country	$t_{c,j}$	η_c
Albania	1970	4.91
Azerbaijan	1992	2.93
Georgia	1992	2.08
Hong Kong, SAR of China	1974	2.75
India	1982	4.7
Korea, Republic of	1980	2.54
Singapore	1970	3.19
Taiwan, Province of China	1977	2.78
median TFR η		2.9

Table 4: Countries with VR-based assessment of SRB inflation start year and corresponding TFR (used to compute the global TFR value η).

Lower truncation of the inflation start year distribution The lower truncation $t_{c,\eta 6}$ of the start year distribution is the year that the TFR in country c decreased to 6 or the year 1970, whichever occurred later.

2.4 Estimation of Sex-Specific Live Births, Missing Female Births, and Aggregates

Sex-specific live births Estimates of country-specific annual live births $B_{c,t}$ are obtained from the UN WPP 2017 [73]. The estimated and expected female live births for a country-year, denoted as $B_{c,t}^F$ and $B_{c,t}^{FE}$ respectively, are computed as:

$$\begin{aligned} B_{c,t}^F &= B_{c,t}/(1+R_{c,t}), \\ B_{c,t}^{FE} &= (B_{c,t} - B_{c,t}^F)/R_{c,t}^E, \text{ where } R_{c,t}^E = \beta_c \cdot P_{c,t}. \end{aligned}$$

$B_{c,t}^{FE}$ is obtained from the estimated number of male births, and the expected SRB for the respective country-year [9]. $R_{c,t}^E$ is the expected SRB by accounting for natural fluctuations around national baseline.

Missing female births The annual number of missing female births (AMFB) for country c in year t is defined as: $B_{c,t}^{F*} = B_{c,t}^{FE} - B_{c,t}^F$. The cumulative number of missing female births (CMFB) for period t_1 to t_2 in country c is defined as the sum of AMFB from the year t_1 up to the year t_2 : $Z_{c,[t_1,t_2]}^{F*} = \sum_{t=t_1}^{t_2} B_{c,t}^{F*}$.

Aggregates Aggregated estimates for the world and regions are based on the totals for the number of live births by sex.

2.5 Selection of Countries with Strong Statistical Evidence of SRB Inflation

For each of the 29 countries at risk of SRB inflation, we compute the probability $\phi_{c,t}$ that the AMFB $B_{c,t}^{F*}$ is above zero for the respective country-year from 1970 to 2017. Let $(B_{c,t}^{F*})^{(g)}$ be the g -th posterior sample of the AMFB $B_{c,t}^{F*}$: $\phi_{c,t} = \sum_{g=1}^G \mathbb{I}((B_{c,t}^{F*})^{(g)} > 0) / G$, for $t = 1970, \dots, 2017$. Then we compute the probability of SRB inflation in country c , which is denoted as δ_c and defined as:

$$\delta_c = \max \{\phi_{c,t} | t = 1970, \dots, 2017\}.$$

A country c is identified as having a strong statistical evidence of SRB inflation if $\delta_c > 95\%$. In total, 12 countries are identified:

- $\delta_c > 95\%$ (all 12 countries have $\delta_c = 100\%$; also listed in Table 8): Albania; Armenia; Azerbaijan; China; Georgia; Hong Kong, SAR of China; India; Republic of Korea; Montenegro; Taiwan, Province of China; Tunisia;
- $\delta_c < 95\%$ (17 countries; also listed in Table 9): Singapore (94.5%); Morocco (88.6%); Nepal (87.9%); Turkey (83.3%); Bangladesh (79.6%); Jordan (47.2%); Pakistan (46.8%); Tajikistan (45.1%); Egypt (43.9%); Senegal (41.3%); Gambia (41.1%); Mali (41.0%); Mauritania (40.9%); Nigeria (40.9%); Tanzania (40.6%); Uganda (40.6%); Afghanistan (40.3%).

2.6 Model Validation

We assess the model performance via three approaches: 1) out-of-sample validation; 2) in-sample validation; and 3) one-country simulation.

2.6.1 Out-of-Sample and In-Sample Validation

To test the performance for the reduced model and inflation model respectively, we leave out 20% of the data points after a certain survey year (instead of reference year) [1]. After leaving out data, we fitted the model to the training data set, and obtain point estimates and uncertainty intervals that would have been constructed based on available data set in the survey year selected. We also assess the model performance using the traditional approach of leaving out data at random, i.e. leaving out 20% of the data randomly, and repeat this exercise 30 times.

We calculate median errors and median absolute errors for the left-out observations, where errors are defined as: $e_j = r_j - \tilde{r}_j$, where \tilde{r}_j refers to the posterior median of the predictive distribution based on the training data set for the j -th left-out observation r_j . Coverage is given by $1/J \cdot \sum 1[r_j \geq l_j] \cdot 1[r_j \leq u_j]$, where J refers to the number of left-out observations, and l_j and u_j correspond to the lower and upper bounds of the 95% prediction interval for the j -th left-out observation r_j . The validation measures are calculated for 1000 sets of left-out observations, where each set consists one randomly selected left-out observation from each country. The reported validation results are based on the mean of the outcomes from the 1000 sets of left-out observations.

For the point estimates based on full data set and training data set, errors are defined as $e_{c,t} = \hat{R}_{c,t} - \tilde{R}_{c,t}$, where $\hat{R}_{c,t}$ is the posterior median for country c in year t based on the full data set, and $\tilde{R}_{c,t}$ is the posterior median for the same

country-year based on the training data set. Coverage is computed in a similar manner as for the left-out observations, based on the lower and upper bounds of the 95% uncertainty interval of $\tilde{R}_{c,t}$ from the training data set.

2.6.2 One-Country Simulation

We assess the inflation model performance by one-country simulation. For each of the 29 countries at risk of SRB inflation, we consider data after reference year 1970 as test data and simulate the SRB using the posterior samples of the global parameters from the inflation model (obtained using the full data set).

The g -th simulated SRB $R_{c,t}^{(g)}$ for country c in year t , and the g -th simulated SRB $R_{c[j],t[j]}^{(g)}$ for the j -th left-out data point after 1970 for country $c[j]$ in year $t[j]$ with data source type $s[j]$ are obtained as follows for $g = 1, \dots, G$:

$$\begin{aligned} R_{c,t}^{(g)} &= \beta_c^{(g)} \cdot P_{c,t}^{(g)} + \alpha_{c,t}^{(g)}, \\ \log(r_{c[j],t[j]}^{(g)}) &\sim \mathcal{N}\left(\log\left(R_{c[j],t[j]}^{(g)}\right), \sigma_j^2 + (\omega_{s[j]}^{(g)})^2\right), \end{aligned}$$

where samples for $\beta_c^{(g)}$ and $\omega_s^{(g)}$ are from the model fit described in Section 2.1, and $P_{c[j],t[j]}^{(g)}$ and $\alpha_{c[j],t[j]}^{(g)}$ are simulated to refer to a “new” country, without taking into account any country-specific data, following the model specification for both parameters. The g -th sample of parameters related to the inflation term $\alpha_{c,t}^{(g)}$ are simulated from their respective hierarchical distributions for $g = 1, \dots, G$:

$$\begin{aligned} a_c^{(g)} &\sim \mathcal{N}\left(\mu_{ac}^{(g)}, (\sigma_{ac}^{(g)})^2\right) T(0,), \\ d_{c,m}^{(g)} &\sim \mathcal{N}\left(\mu_{d(m)}^{(g)}, (\sigma_{d(m)}^{(g)})^2\right) T(0,), \text{ for } m = 1, 2, 3, \\ t_{c,0}^{(g)} &\sim t\left(t_{c,\eta}, (\sigma_\eta^{(g)})^2, v = 3\right) T(t_{c[j],\eta}6,), \end{aligned}$$

with posterior samples for hierarchical means and variance parameters obtained from the model fit to the full data set. After generating the simulated values, we calculate the same set of results as described in Section 2.6.1 on out-of-sample validation.

2.7 MCMC Specifications and Rounding

We obtain posterior samples using a Markov chain Monte Carlo (MCMC) algorithm, implemented in the open source software R 3.3.3 [60] and JAGS 4.0.1 (Just another Gibbs Sampler) [57], using R-packages rjags [58], R2jags [65] and MCMCpack [47]. Convergence of the MCMC algorithm and the sufficiency of the number of samples obtained are checked through visual inspection of trace plots and convergence diagnostics of Gelman and Rubin [23], implemented in the coda R-package [59]. Table 5 summarizes the MCMC specifications for model runs.

MCMC Specifications	Full	Normal Model Validation		Inflation Model	
		Out-of-Sample	In-Sample	Full	Validation Out-of-Sample
# Chains	8	8	8	13	4
# Burn-in	8,000	8,000	8,000	14,000	10,000
# Thinning	20	20	20	12	10
# Posterior samples per parameter	4,000	4,000	4,000	9,425	4,000

Table 5: MCMC specifications.

Rounding We keep three decimal places for results related to SRB.

3 Validation and Simulation Results

To test the performance of the “normal model” as described in Section 2.2 for country-years without SRB inflation, we conduct: 1) 1 out-of-sample validation by leaving out observations obtained from the year 2005 onward, consisting 20.3% of the total observations; and 2) 30 rounds of in-sample validations by randomly leaving out 20% observations. To test the performance of the “inflation model” as described in Section 2.3 for country-years with potential SRB inflation, we leave out observations obtained from the year 2010 onward, consisting 19.8% of the total observations.

The validation results indicate reasonably good calibrations of the normal model and the inflation model. Table 6 summarizes the results related to the left-out observations for the validation exercise. Median errors and median absolute errors are very close to zero for left-out observations. The coverage of 95% and 80% prediction intervals are as expected and symmetrical. Table 7 shows results for the comparison between estimates obtained based on the full dataset and estimates based on the training set for the out-of-sample validation exercises. Median errors and the median absolute errors are close to zero. The proportions of updated estimates that fall below the uncertainty intervals constructed based on the training set are all within the expected range.

	Normal Model		Inflation Model	
	Validation		Out-of-Sample	Simulation
	Out-of-Sample	In-sample		
# Country in training dataset	176	184	33	33
# Country in test dataset	143	169	30	30
Median error	0.000	-0.001	-0.00	0.006
Median absolute error	0.015	0.012	0.02	0.03
Below 95% prediction interval (%)	2.7	3.0	3.8	1.8
Above 95% prediction interval (%)	3.6	2.3	4.9	4.5
Expected (%)	2.5	2.5	2.5	2.5
Below 80% prediction interval (%)	9.7	9.8	9.1	7.4
Above 80% prediction interval (%)	10.2	8.2	10.7	13.1
Expected (%)	10	10	10	10

Table 6: **Validation and simulation results for left-out observations.** Error is defined as the difference between a left-out observation and the posterior median of its predictive distribution. In-sample validation results are average of 30 runs.

Validation (Out-of-Sample)	Normal Model			Inflation Model		
	1995	2005	2015	1995	2005	2015
Median error	0.001	0.000	0.001	0.001	-0.000	-0.005
Median absolute error	0.003	0.004	0.004	0.000	-0.000	-0.000
Below 95% uncertainty interval (%)	2.4	2.4	0.9	0.0	0.0	3.0
Above 95% uncertainty interval (%)	2.4	2.8	2.8	0.0	0.0	3.0
Expected proportions (%)	≤2.5	≤2.5	≤2.5	≤2.5	≤2.5	≤2.5
Below 80% uncertainty interval (%)	9.0	9.0	4.7	0.0	0.0	12.1
Above 80% uncertainty interval (%)	8.0	9.4	8.0	0.0	3.0	6.1
Expected proportions (%)	≤10	≤10	≤10	≤10	≤10	≤10

Table 7: **Validation results for estimates based on training set.** Error is defined as the differences between an estimate based on full dataset and training set. The proportions refer to the proportions (%) of countries in which the median SRB estimates based on the full dataset fall below or above their respective 95% and 80% uncertainty intervals based on the training set.

4 Exploration of the Relation between SRB and Predictors

4.1 SRB without Inflation

We do not use external predictors to model national or regional baselines nor the natural fluctuations in the SRB. In this subsection, we provide exploratory plots to illustrate that the relation between SRB and predictors varies across regions and across countries. The predictors we explored are: TFR (to approximate parity) and gross domestic product (GDP) per capita. We exclude data from country-years with potential SRB inflation (i.e. data from the 29 selected countries listed in Table 3 with reference year after 1970) for the analyses.

We use local polynomial regression fitting (loess) curves to summarize the relationships on global level by using data from all countries, and on regional level by using data from all countries in a region. Data points are weighted by their corresponding sampling errors (for non-VR data) or stochastic errors (for VR data). The loess fittings are shown for the 5th to 95th percentiles of the input data (i.e. all data within a region for regional loess or data from all countries for global loess).

The relations between SRB and TFR (Figure 2) and between SRB and GDP per capita (Figure 3) are not consistent across regions. While the global relation between SRB and TFR is in-line with the findings from literature that birth order has a negative effect on SRB [13, 18, 21, 34, 44, 45, 52, 54, 55, 62, 63, 66, 67, 68], this relation is not observed on regional level. E.g. in sub-Saharan Africa, there is little variation in SRB with TFR. In the ENAN region, the regions where most high quality VR data are from, there is a reversal in trend with decreasing TFR. Regarding the global relation between SRB and GDP per capita (Figure 3), we observe that the SRB increases as GDP per capita increases until it reaches around 3000 US dollar. Then the SRB decreases as GDP per capita further increases. A previous study [69] found higher SRB for higher socioeconomic index and higher income, which is in-line with the first half of the relation we observe in Figure 3 but not the second half. Moreover, regional patterns vary with ENAN showing a very small decrease with increasing GDP while limited changes are observed in sub-Saharan Africa. Similarly, after removing the country-specific levels, the relations between the observed SRB minus estimated country-level baselines and the same predictors (Figure 2 and Figure 3, right plots) are not consistent across regions.

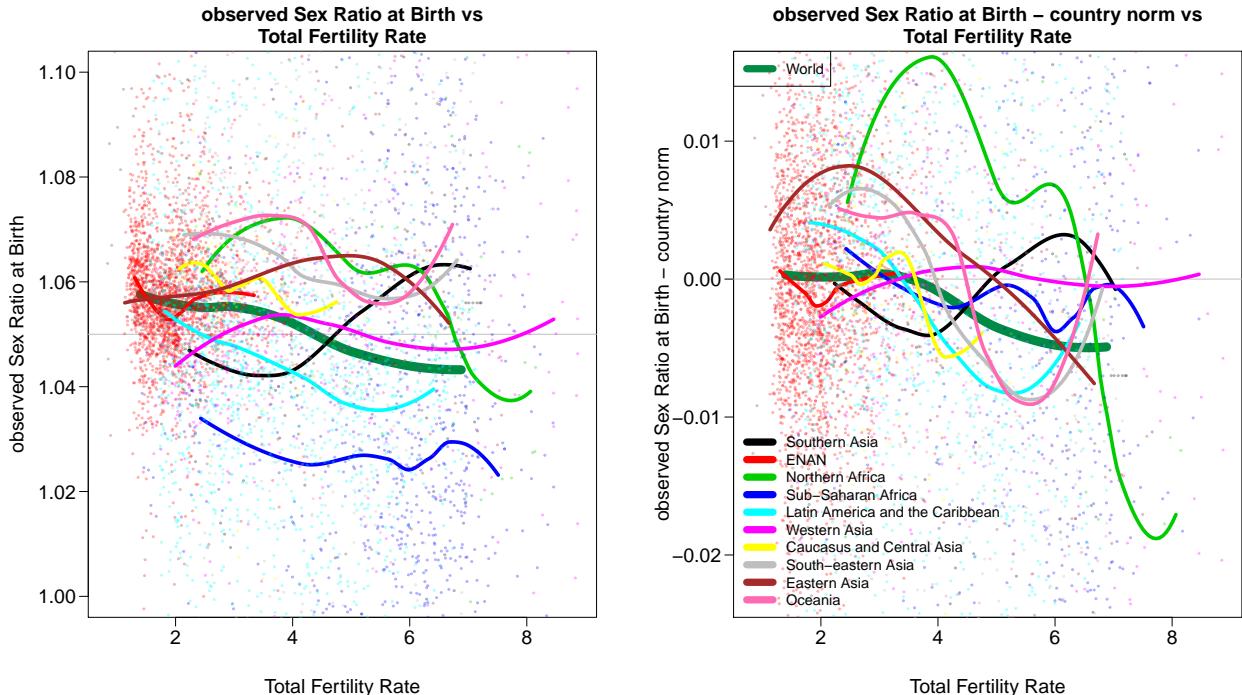


Figure 2: Relation between SRB and total fertility rate (TFR), by region. Left: observed SRB against TFR. Right: the difference between observed SRB and estimated country-level baselines against TFR. Dots and loess curves are colored by regions. Data from country-years with potential SRB inflation are not used in the plot. ENAN: the combination of countries in Europe, North America, Australia, and New Zealand.

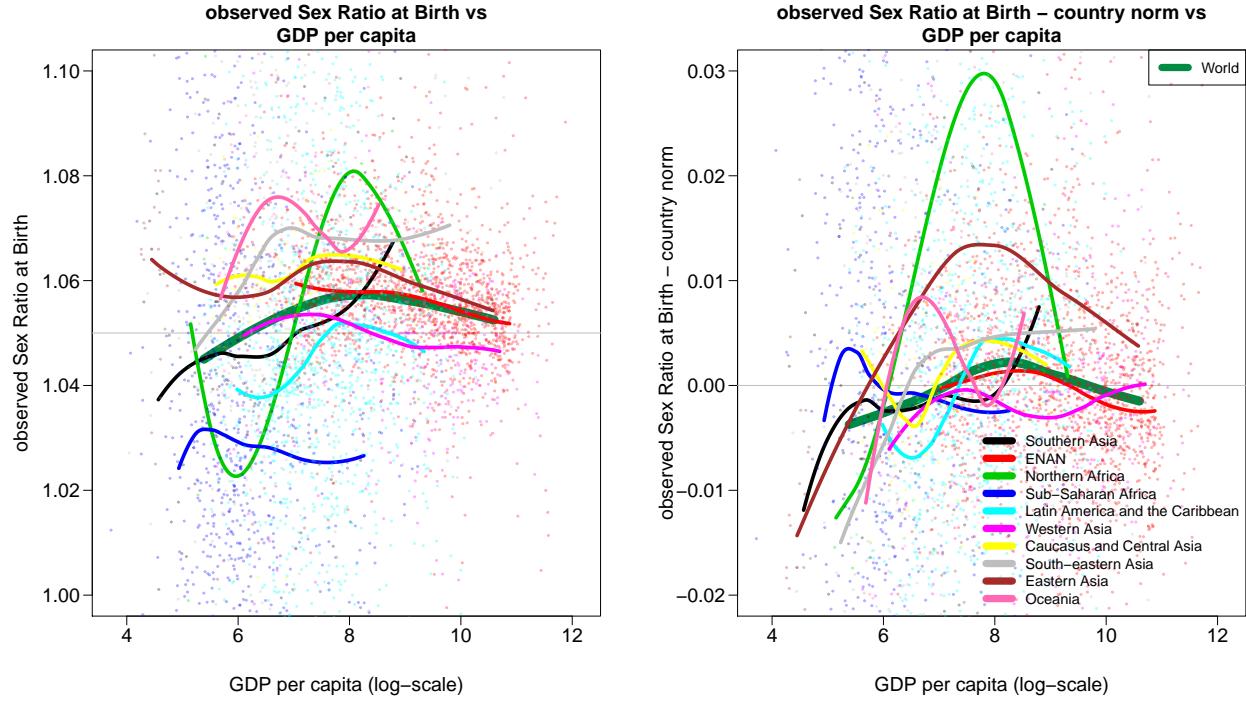


Figure 3: Relation between SRB and gross domestic product (GDP) per capita, by region. Left: observed SRB against GDP per capita (log-scale). Right: the difference between observed SRB and estimated country-level baselines against GDP per capita (log-scale). Dots and loess curves are colored by regions. Data from country-years with potential SRB inflation are not used in the plot. ENAN: the combination of countries in Europe, North America, Australia, and New Zealand.

Furthermore, the relations between the SRB and the TFR and GDP per capita are not consistent at the country level (Figure 4).

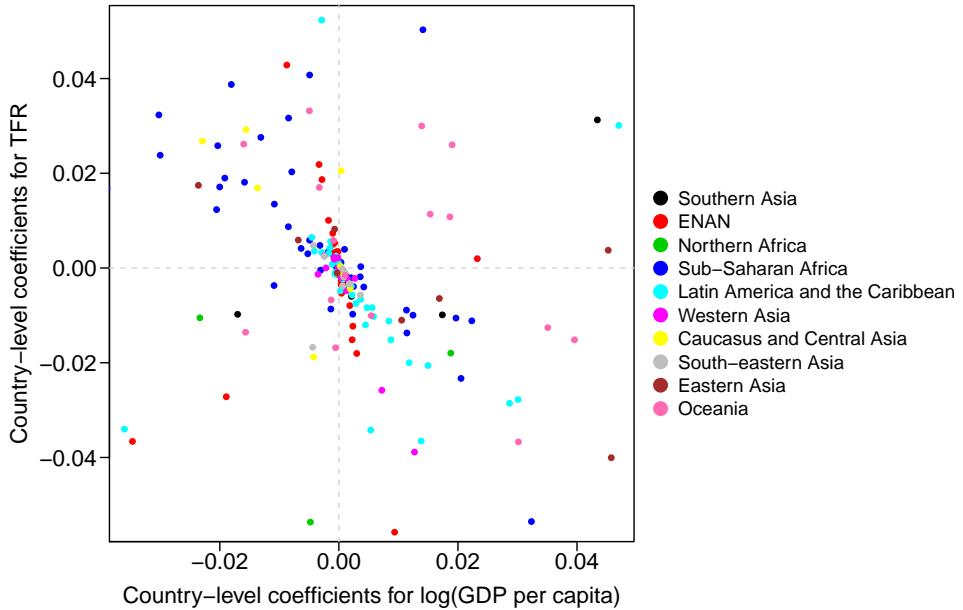


Figure 4: SRB regression model with country-specific coefficients for TFR and GDP per capita. Dots are median estimates of the coefficients and are colored by region. Data from country-years with potential SRB inflation are not used in the regression model fitting. ENAN: the combination of countries in Europe, North America, Australia, and New Zealand.

We fit a regression model:

$$\log(r_i) \sim \mathcal{N} \left(\hat{\beta}_{c[i]} + \theta_{c[i]} \cdot x_i + \phi_{c[i]} \cdot z_i, \sigma_i^2 + \hat{\omega}_{s[i]}^2 \right),$$

where index i refers to the i -th observation, r_i is the observed SRB (excluding country-years with potential risk of sex-selective abortion), σ_i^2 is the sampling or stochastic variance (which is a given value), $\hat{\omega}_{s[i]}^2$ is the median estimate of the non-sampling error for data source type s , $\hat{\beta}_{c[i]}$ is the median estimate of the national baseline for country c , x_i is TFR and z_i is GDP per capita on log-scale. θ_c and ϕ_c are country-level coefficients for x and z respectively. Figure 4 shows the median estimates of θ_c and ϕ_c of the regression models. No particular trend is shown in Figure 4.

In summary, while on global level the relations between SRB and TFR or GDP are in line (or partially in line) with hypotheses, the expected relations do not hold true at the regional or country levels.

4.2 SRB with Inflation

We explored the relation between the DSRB and the maximum level of SRB inflation a_c for the sex ratio transition model (refer to Section 2.3 for model details). We use the maximum level (intensity) of SRB inflation to represent the severity of the SRB imbalance. Figure 5 illustrates this relation based on the estimates of the maximum level of SRB inflation a_c for the 29 countries that are modeled with the sex ratio transition, and the maximum or median of DSRB. The figure shows that the estimated maximum levels do not increase with DSRB summary measures. Notably, India, which has among the highest DSRB outcomes has a lower-than-average maximum SRB inflation level.

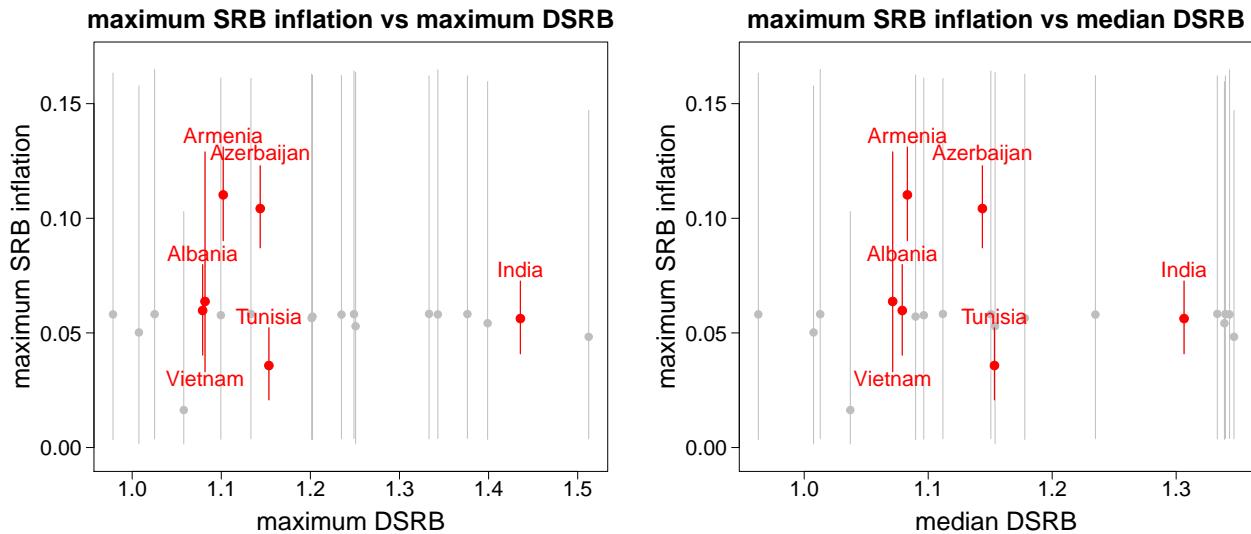


Figure 5: Relation between SRB maximum inflation and desired sex ratio at birth (DSRB), for countries modeled with sex ratio transition. Y-axis is the estimated parameter for the maximum level of SRB inflation. Dots refer to median estimates. Vertical line segments refer to 95% uncertainty intervals of the estimates. Countries with strong statistical evidence of SRB inflation are highlighted in red. Left: against the maximum DSRB. Right: against the median DSRB.

Six out of the 29 countries at risk of SRB inflation have DSRB data. Among the six countries, we do not observe clear relation between the DSRB and the maximum level of SRB inflation. Hence, based on current available exploratory analysis, we do not integrate DSRB in our SRB inflation model.

5 Sensitivity Analysis of SRB Inflation Start Year Model Assumption

In Section 2.3, we describe the SRB model for country-years with risk of SRB inflation. The start year of SRB inflation period for a country follows a Student- t distribution with degree of freedom 3, with mean at the year in which the TFR falls to 2.9 for that country, a global variance parameter and a lower truncation $t_{c,\eta 6}$ (the year when the TFR falls to 6 for that country). That is,

$$t_{c,0} \sim t(t_{c,\eta}, \sigma_\eta^2, v = 3)T(t_{c,\eta 6},).$$

To test whether the model is sensitive to son preference and TFR, we fit an alternative model where the only difference to the original model in Section 2.3 is the distribution for start year. In this alternative model, the start year for all the 29 countries at risk of SRB inflation follows identical and independent uniform distribution after the the year when the TFR in each country declines to 6, $t_{c,\eta 6}$:

$$t_{c,0} \sim \mathcal{U}(t_{c,\eta 6},).$$

Table 8 shows sensitivity test results for the 12 countries identified with strong statistical evidence of SRB inflation (see Section 2.5 for selection procedures). We compare the median estimates of the start year based on the original model (with fertility decline setting) and the alternative model (without fertility decline setting), and their corresponding TFR value of the year. For the 12 countries, the start year estimates are not sensitive to the fertility decline setting. The estimated start years are around the same level for the 12 countries based on the two models.

Country	Inflation Probability	Original Model		Alternative Model	
		Start Year	TFR	Start Year	TFR
Albania	100%	1988 [1973; 1997]	3.1	1993	2.8
Armenia	100%	1992 [1990; 1993]	2.4	1991	2.5
Azerbaijan	100%	1991 [1988; 1994]	3.0	1991	3.0
China	100%	1981 [1972; 1989]	2.6	1983	2.6
Georgia	100%	1992 [1977; 1994]	2.1	1992	2.1
Hong Kong, SAR of China	100%	2004 [2002; 2005]	1.0	2003	1.0
India	100%	1975 [1970; 1981]	5.2	1979	4.9
Korea, Republic of	100%	1982 [1978; 1984]	2.3	1983	2.1
Montenegro	100%	1980 [1971; 1991]	2.2	1984	2.2
Taiwan, Province of China	100%	1982 [1972; 1987]	2.3	1984	2.1
Tunisia	100%	1982 [1976; 1989]	4.9	1982	4.9
Vietnam	100%	2001 [1991; 2005]	2.0	2003	1.9

Table 8: **Sensitivity test results for countries with strong statistical evidence of inflated SRB.** Original model: with fertility decline incorporated. Alternative model: without considering fertility decline. The 95% uncertainty intervals are in brackets. Countries are in alphabetic order.

In Table 9, the sensitivity test results show that for other countries with smaller probabilities of SRB inflation, the estimation of the start year is sensitive to the fertility decline model setup. Singapore, Morocco, Nepal, Turkey and Bangladesh have probabilities greater than 60% of having an inflation according to the original model. Their start years are estimated to be before 2017 in the original model. Under the alternative setting with uniform prior on the start year, their start years are estimated to be after 2017. The deviation of the estimated SRB from the country-specific baselines are considered entirely due to the natural fluctuation by the alternative model. The probabilities of SRB inflation in Pakistan and Egypt are 46.8% and 43.9% respectively. The start years for the two countries are estimated to be after 2017 in the original model and before 2017 in the alternative model.

Country	Inflation Probability	Original Model		Alternative Model	
		Start Year	TFR	Start Year	TFR
Singapore	94.5%	1973 [1970; 2017]	2.7	after 2017	–
Morocco	88.6%	2007 [1990; *]	2.6	after 2017	–
Nepal	87.9%	2010 [1995; *]	2.6	after 2017	–
Turkey	83.3%	1990 [1973; *]	3.1	after 2017	–
Bangladesh	79.6%	2013 [1997; *]	2.2	after 2017	–
Jordan	47.2%	* [2011; *]	–	after 2017	–
Pakistan	46.8%	* [1992; *]	–	1992 [1990; *]	5.8
Tajikistan	45.1%	* [2012; *]	–	after 2017	–
Egypt	43.9%	* [2011; *]	–	1990 [1985; *]	4.7
Senegal	41.3%	* [*; *]	–	after 2017	–
Gambia	41.1%	* [*; *]	–	after 2017	–
Mali	41.0%	* [*; *]	–	after 2017	–
Mauritania	40.9%	* [*; *]	–	after 2017	–
Nigeria	40.9%	* [*; *]	–	after 2017	–
Tanzania	40.6%	* [*; *]	–	after 2017	–
Uganda	40.6%	* [*; *]	–	after 2017	–
Afghanistan	40.3%	* [2013; *]	–	after 2017	–

Table 9: **Sensitivity test results for countries without strong statistical evidence of inflated SRB.** Original model: with fertility decline incorporated. Alternative model: without considering fertility decline. *: year is after 2017. The 95% uncertainty intervals are in brackets. Countries are in descending order of the inflation probability.

6 Regional and National SRB Baseline Comparison

We compare our estimated regional and national baseline SRB with values from other studies. The studies used for comparison are from analyses of subpopulations in countries with high-quality vital registration system. Both the regional baseline comparison in Table 10 and national baseline comparison in Table 11 show that our model results are consistent with most of the reported baseline values from other studies. That is, the reported baseline values from other studies fall within the uncertainty intervals of our model or the uncertainty intervals from other studies and from our model overlap. In very few cases where the reported baseline values from other studies fall outside the uncertainty intervals of our model (e.g. for Cuba in Table 11). Given that the external study does report uncertainty interval, it is inconclusive that whether our model results and reported values from other study are consistent or not in such case.

Region	Regional Baseline	
	Model	Other Study
ENAN	1.058 [1.055; 1.061]	UK*: 1.056 [1.055; 1.057]; US, Canada, Australia, New Zealand*: 1.063 [1.051; 1.075]; Europe non-UK*: 1.057 [1.051; 1.064]; Non-Hispanic white [‡] : 1.051; Non-Hispanic white [§] : 1.054;
sub-Saharan Africa	1.031 [1.027; 1.036]	Southern Africa*: 1.048 [1.023; 1.073]; East Africa*: 1.039 [1.027; 1.052]; rest of Africa*: 1.022 [1.009; 1.033]; Non-Hispanic black [‡] : 1.030; Non-Hispanic black [§] : 1.031;
Latin America and the Caribbean	1.041 [1.037; 1.044]	Caribbean*: 1.031 [1.020; 1.044]; Central and South America [§] : 1.044;
southeastern Asia	1.063 [1.055; 1.072]	Far East*: 1.056 [1.035; 1.079];

Table 10: **Regional SRB baseline comparison.** Regional baselines from the model are presented with median estimates followed by 95% uncertainty intervals in brackets. ENAN: the combination of countries in Europe, North America, Australia, and New Zealand. § study [48]: values are the average of the reported SRB in the USA from available years during 1970–2002 by race and Hispanic origin of mother (table 4). * study [15]: values are the average SRB between 1969 and 2005 in England and Wales by birthplace of mother (table 2). The 99% uncertainty intervals are in the brackets after the average SRB, and are approximated numbers (figure 1).² Rest of Africa = Cameroon, Gambia, Ghana, Mauritius, Mozambique, Nigeria, Seychelles, Sierra Leone. Far East = Brunei, Malaysia, Singapore. ‡ study [10]: values are the average of the reported SRB in the USA in 1991, 1996, 2001 and 2006 for Black non-Hispanic and for White non-Hispanic (table 2).

² Note: study [15] only published 99% uncertainty intervals. The 95% uncertainty intervals for these results will be narrower than 99% uncertainty intervals.

Country	National Baseline	
	Model	Other Study
Bangladesh	1.050 [1.029; 1.070]	1.022 [1.010; 1.035]*
China	1.063 [1.044; 1.082]	1.074 [§]
Cuba	1.065 [1.056; 1.073]	1.054 [§]
India	1.053 [1.032; 1.075]	1.054 [1.045; 1.064]*
Japan	1.050 [1.044; 1.056]	1.055 [§]
Mexico	1.037 [1.021; 1.054]	1.041 [§]
Pakistan	1.056 [1.037; 1.078]	1.048 [1.040; 1.056]*
Philippines	1.076 [1.065; 1.087]	1.072 [§]
Puerto Rico	1.050 [1.042; 1.058]	1.045 [§]

Table 11: **National SRB baseline comparison.** National baselines from the model are presented with median estimates followed by 95% uncertainty intervals in brackets. § study [48]. * study [15].

7 Missing Female Births Comparison

We compare our estimated annual number of missing female births with numbers from other studies (Table 12).

Country, Year	Study	# Total Birth (,000)	Expected SRB Model	Estimated SRB Model	# Missing Female Births (,000) Model	Study
China, 1987	[33]	26,528	1.066	1.060	1.101	1.096
India, 1997	[36]	27,777	1.055	1.053	1.110	1.112

Table 12: **Missing female births comparison.** Numbers of total births are from the UN WPP 2017 [73]. Number of missing female births for study shown in this table may be slightly different from the reported numbers due to the difference in the total number of births used. 95% uncertainty intervals for model results are in brackets.

The AMFB for country c in year t is defined as the difference between the estimated and the expected female births (i.e. $B_{c,t}^{F*} = B_{c,t}^{FE} - B_{c,t}^F$; see Section 2.4). Omitting the index c and t for simplicity and use $s1$ and $s2$ to denote different sets of results, we decomposed Δ^{F*} , the total difference of the number of missing female births between our model estimates and other studies into two parts: 1) Δ^{FE} : due to difference in the expected SRB; and 2) Δ^F : due to the difference in estimated SRB:

$$\begin{aligned}\Delta^{F*} &= B_{s1}^{F*} - B_{s2}^{F*} \\ &= (B_{s1}^{FE} - B_{s1}^F) - (B_{s2}^{FE} - B_{s2}^F) \\ &= (B_{s1}^{FE} - B_{s2}^{FE}) + (B_{s2}^F - B_{s1}^F) \\ &= \Delta^{FE} + \Delta^F.\end{aligned}$$

For China reference year 1987, the difference between our model estimate and study [33] is 15 thousand. The estimated female births in the study is 30 thousand larger than our model result and the expected female births in the study is 45 thousand higher than our model result. In the study, the author assumed the reference point of SRB to be 1.06. The study reported SRB in the 1987 One-per-Hundred National Population Survey, which is 1.096. This value is the SRB of zero-year-old children alive on July 1st, 1987 recorded on the household schedule. In contrast, our estimated SRB for China in 1987 is based on a time series of data points, including China Education Statistics.

For India reference year 1997, 16% of the 39 thousand difference in the missing female births is due to the difference in the estimated SRB and 84% is due to the difference in the expected SRB.

8 Country-Level Case Studies

Figure 7 illustrates data and estimates for all countries. Sweden, Guatemala, Zimbabwe and Cuba are examples of countries without risk of SRB inflation with varying levels of data availability. Sweden typifies countries with high quality annual VR data, here available from 1753 to 2016. SRB model median estimates follow the VR data trend and the uncertainty assessment takes into account the stochastic uncertainty associated with the VR data. The estimated SRB for Sweden ranges from 1.040 [1.033; 1.048] in 1784 to 1.066 [1.059; 1.073] in 1956. Guatemala, a lower-middle income country from Latin America and the Caribbean, has data from VR as well as surveys. The data period is from 1948 to 2015. The estimated SRB for Guatemala was the highest in 1960 at 1.051 [1.042; 1.060] and was the lowest in 2005 at 1.031 [1.023; 1.040]. The SRB median estimates are mostly informed by the VR data since the VR data have less uncertainty associated with them as compared to survey data. Zimbabwe, a low-income country in Sub-Saharan Africa, only has survey data that are subject to large sampling errors. Its SRB was estimated approximately equal to its country-specific baseline level of 1.027 for the whole observation period. Its country-specific baseline level is estimated to be in line with its corresponding regional baseline because little information is provided by country-specific survey data. Cuba is an example country with extreme SRB fluctuations that are not due to sex-selective abortion and that are not during a national crisis period according to the UN IGME criteria [71]. The SRB fluctuations in Cuba are modeled as natural fluctuations in this study, they are analyzed in detail elsewhere [75].

References

- [1] Alkema, L., Wong, M. B., and Seah, P. R. (2012). Monitoring progress towards Millennium Development Goal 4: A call for improved validation of under-five mortality rate estimates. *Statistics, Politics, and Policy*, 3(2).
- [2] Altindag, O. (2016). Son preference, fertility decline, and the nonmissing girls of Turkey. *Demography*, 53(2):541–566.
- [3] Aly, H. Y. and Shields, M. P. (1991). Son preference and contraception in Egypt. *Economic Development and Cultural Change*, 39(2):353–370.
- [4] Bairagi, R. (2001). Effects of sex preference on contraceptive use, abortion and fertility in Matlab, Bangladesh. *International Family Planning Perspectives*, pages 137–143.
- [5] Basten, S. and Verropoulou, G. (2013). ‘Maternity migration’ and the increased sex ratio at birth in Hong Kong SAR. *Population Studies*, 67(3):323–334.
- [6] Beyeza-Kashesya, J., Neema, S., Ekstrom, A. M., and Kaharuza, F. (2010). “Not a Boy, Not a Child”: A qualitative study on young people’s views on childbearing in Uganda. *African Journal of Reproductive Health*, 14(1).
- [7] Bhat, P. M. (2002). Completeness of India’s sample registration system: an assessment using the general growth balance method. *Population Studies*, 56(2):119–134.
- [8] Bongaarts, J. (2013). The implementation of preferences for male offspring. *Population and Development Review*, 39(2):185–208.
- [9] Bongaarts, J. and Guilmoto, C. Z. (2015). How many more missing women? Excess female mortality and prenatal sex selection, 1970–2050. *Population and Development Review*, 41(2):241–269.
- [10] Branum, A. M., Parker, J. D., and Schoendorf, K. C. (2009). Trends in US sex ratio by plurality, gestational age and race/ethnicity. *Human Reproduction*, 24(11):2936–2944.
- [11] Choi, B.-H. (1991). Sources of data for vital statistics in the republic of Korea. *The Journal of The Population Association of Korea*, 14(1):104–120. In Korean, available at <http://www.dbpia.co.kr/Journal/ArticleDetail/596560>.
- [12] Chowdhury, M. K. and Bairagi, R. (1990). Son preference and fertility in Bangladesh. *Population and Development Review*, pages 749–757.
- [13] Ciocco, A. (1938). Variation in the sex ratio at birth in the United States. *Human Biology*, 10(1):36.
- [14] Coale, A. J. and Banister, J. (1994). Five decades of missing females in China. *Demography*, 31(3):459–479.
- [15] Dubuc, S. and Coleman, D. (2007). An Increase in the Sex Ratio of Births to India-born Mothers in England and Wales: Evidence for Sex-Selective Abortion. *Population and Development Review*, 33(2):383–400.
- [16] Duthé, G., Meslé, F., Vallin, J., Badurashvili, I., and Kuyumjian, K. (2012). High sex ratios at birth in the Caucasus: modern technology to satisfy old desires. *Population and Development Review*, 38(3):487–501.
- [17] El-Zeini, L. O. (2008). The path to replacement fertility in Egypt: acceptance, preference, and achievement. *Studies in Family Planning*, 39(3):161–176.
- [18] Erickson, J. D. (1976). The secondary sex ratio in the United States 1969–71: association with race, parental ages, birth order, paternal education and legitimacy. *Annals of Human Genetics*, 40(2):205–212.
- [19] Fantom, N. and Serajuddin, U. (2016). The World Bank’s Classification of Countries by Income. *Policy Research Working Paper*, 7528.
- [20] Frost, M. D., Puri, M., and Hinde, P. R. A. (2013). Falling sex ratios and emerging evidence of sex-selective abortion in Nepal: evidence from nationally representative survey data. *BMJ open*, 3(5):e002612.
- [21] Garfinkel, J. and Selvin, S. (1976). A multivariate analysis of the relationship between parental age and birth order and the human secondary sex ratio. *Journal of Biosocial Science*, 8(2):113–121.

- [22] Gelman, A., Carlin, J. B., Stern, H. S., and Rubin, D. B. (2004). *Bayesian Data Analysis*. Chapman & Hall/CRC, Boca Raton, Fl., 2nd edition.
- [23] Gelman, A. and Rubin, D. (1992). Inference from iterative simulation using multiple sequences. *Statistical Science*, 7:457–511.
- [24] Goodkind, D. (2011). Child underreporting, fertility, and sex ratio imbalance in China. *Demography*, 48(1):291–316.
- [25] Graham, E. (2007). Son preference, Female Deficit and Singapore’s Fertility Transition. *Watering the Neighbour’s Garden: The Growing Demographic Female Deficit in Asia*, Paris: Committee for International Cooperation in National Research in Demography, pages 89–106.
- [26] Guilmoto, C. (2012a). *Sex Imbalances at Birth: Current trends, consequences and policy implications*. UNFPA Asia and Pacific Regional Office, Bangkok, Thailand.
- [27] Guilmoto, C. Z. (2009). The sex ratio transition in Asia. *Population and Development Review*, 35(3):519–549.
- [28] Guilmoto, C. Z. (2012b). Skewed sex ratios at birth and future marriage squeeze in China and India, 2005–2100. *Demography*, 49(1):77–100.
- [29] Guilmoto, C. Z., Hoang, X., and Van, T. N. (2009). Recent increase in sex ratio at birth in Viet Nam. *PLoS One*, 4(2):e4624.
- [30] Guilmoto, C. Z. and Ren, Q. (2011). Socio-economic Differentials in Birth Masculinity in China. *Development and Change*, 42(5):1269–1296.
- [31] Gupta, M. D., Chung, W., and Shuzhuo, L. (2009). Evidence for an incipient decline in numbers of missing girls in China and India. *Population and Development Review*, 35(2):401–416.
- [32] Hatlebakk, M. (2017). Son Preference, Number of Children, Education and Occupational Choice in Rural Nepal. *Review of Development Economics*, 21(1):1–20.
- [33] Hull, T. H. (1990). Recent trends in sex ratios at birth in China. *Population and Development Review*, pages 63–83.
- [34] Imaizumi, Y. and Murata, M. (1979). The secondary sex ratio, paternal age, maternal age and birth order in Japan. *Annals of Human Genetics*, 42(4):457–465.
- [35] James, W. H. (1987). The human sex ratio. Part 1: A review of the literature. *Human Biology*, pages 721–752.
- [36] Jha, P., Kumar, R., Vasa, P., Dhingra, N., Thiruchelvam, D., and Moineddin, R. (2006). Low male-to-female sex ratio of children born in India: national survey of 1·1 million households. *The Lancet*, 367(9506):211–218.
- [37] Kim, N. (1997). An evaluation of the vital registration system in Korea. *Korea Demography*, 20(1):47–63. In Korean, available at <http://www.dbpia.co.kr/Journal/ArticleDetail/596644>.
- [38] Koolwal, G. B. (2007). Son preference and child labor in Nepal: The household impact of sending girls to work. *World Development*, 35(5):881–903.
- [39] Lambert, S. and Rossi, P. (2016). Sons as widowhood insurance: Evidence from Senegal. *Journal of Development Economics*, 120:113–127.
- [40] Lee, I.-W., Lai, Y.-C., Kuo, P.-L., and Chang, C.-M. (2012). Human sex ratio at amniocentesis and at birth in Taiwan. *Taiwanese Journal of Obstetrics and Gynecology*, 51(4):572–575.
- [41] Leone, T., Matthews, Z., and Zuanna, G. D. (2003). Impact and determinants of sex preference in Nepal. *International Family Planning Perspectives*, pages 69–75.
- [42] Lin, T.-C. (2009). The decline of son preference and rise of gender indifference in Taiwan since 1990. *Demographic Research*, 20:377.

- [43] Lindley, D. V. and Smith, A. F. M. (1972). Bayes estimates for the linear model. *34*:1–41.
- [44] Macmahon, B. and Pugh, T. F. (1953). Influence of birth order and maternal age on the human sex ratio at birth. *British Journal of Preventive & Social Medicine*, 7(2):83.
- [45] MacMahon, B. and Pugh, T. F. (1954). Sex ratio of white births in the United States during the Second World War. *American Journal of Human Genetics*, 6(2):284.
- [46] Manchanda, S., Saikia, B., Gupta, N., Chowdhary, S., and Puliyal, J. M. (2011). Sex Ratio at Birth in India, Its Relation to Birth Order, Sex of Previous Children and Use of Indigenous Medicine. *PloS one*, 6(6):e20097.
- [47] Martin, A. D., Quinn, K. M., and Park, J. H. (2011). MCMCpack: Markov Chain Monte Carlo in R. *Journal of Statistical Software*, 42(9):22.
- [48] Mathews, T. and Hamilton, B. E. (2005). Trend analysis of the sex ratio at birth in the United States. *National Vital Statistics Reports*, 53(20):1–17.
- [49] Meslé, F., Vallin, J., and Badurashvili, I. (2007). A sharp increase in sex ratio at birth in the Caucasus. Why? How? *Watering the Neighbour's Garden: The Growing Demographic Female Deficit in Asia*, Paris: Committee for International Cooperation in National Research in Demography, pages 73–88.
- [50] Milazzo, A. (2014). Son preference, fertility and family structure: Evidence from reproductive behavior among Nigerian women. *World Bank Policy Research Working Paper*, (6869).
- [51] Mwageni, E. A., Ankomah, A., and Powell, R. A. (2001). Sex preference and contraceptive behaviour among men in Mbeya region, Tanzania. *Journal of Family Planning and Reproductive Health Care*, 27(2):85–89.
- [52] Myers, R. J. (1954). The effect of age of mother and birth order on sex ratio at birth. *The Milbank Memorial Fund Quarterly*, 32(3):275–281.
- [53] Nnadi, I. (2013). Son Preference – A Violation of Women’s Human Rights: A Case Study of Igbo Custom in Nigeria. *Journal of Politics and Law*, 6:134.
- [54] Novitski, E. and Kimball, A. (1958). Birth order, parental ages, and sex of offspring. *American Journal of Human Genetics*, 10(3):268.
- [55] Novitski, E. and Sandler, L. (1956). The relationship between parental age, birth order and the secondary sex ratio in humans. *Annals of Human Genetics*, 21(2):123–131.
- [56] Park, C. B. and Cho, N.-H. (1995). Consequences of son preference in a low-fertility society: imbalance of the sex ratio at birth in Korea. *Population and Development Review*, pages 59–84.
- [57] Plummer, M. (2003). *JAGS: A Program for Analysis of Bayesian Graphical Models Using Gibbs Sampling*. Proceedings of the 3rd International Workshop on Distributed Statistical Computing (DSC 2003), March 20-22, Vienna, Austria. ISSN 1609-395X.
- [58] Plummer, M. (2011). *rjags: Bayesian graphical models using MCMC*. R package version 3-5.
- [59] Plummer, M., Best, N., Cowles, K., and Vines, K. (2006). CODA: Convergence Diagnosis and Output Analysis for MCMC. *R News*, 6(1):7–11.
- [60] R Core Team (2017). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria.
- [61] Rossi, P. and Rouanet, L. (2015). Gender Preferences in Africa: A Comparative Analysis of Fertility Choices. *World Development*, 72:326–345.
- [62] Ruder, A. (1985). Paternal-age and birth-order effect on the human secondary sex ratio. *American Journal of Human Genetics*, 37(2):362.
- [63] Russell, W. (1936). Statistical study of the sex ratio at birth. *Epidemiology & Infection*, 36(3):381–401.

- [64] Sharma, O. and Haub, C. (2008). Sex ratio at birth begins to improve in India. *Population Reference Bureau*. Available from <http://www.prb.org/Publications/Articles/2008/indiasexratio.aspx>.
- [65] Su, Y. S. and Yajima, M. (2011). *R2jags: A Package for Running jags from R*. R package version 0.02-17.
- [66] Takahashi, E. (1954). The effects of the age of the mother on the sex ratio at birth in Japan. *Annals of the New York Academy of Sciences*, 57(1):531–550.
- [67] Tarver, J. D. and Lee, C.-F. (1968). Sex ratio of registered live births in the United States, 1942–63. *Demography*, 5(1):374–381.
- [68] Teitelbaum, M. S. (1970). Factors affecting the sex ratio in large populations. *Journal of Biosocial Science*, 2(S2):61–71.
- [69] Teitelbaum, M. S. and Mantel, N. (1971). Socio-economic factors and the sex ratio at birth. *Journal of Biosocial Science*, 3(1):23–42.
- [70] Thein, M. and Goh, L. (1990). The value of the girl child in Singapore. *The Journal of the Singapore Paediatric Society*, 33(3-4):107–116.
- [71] UNICEF, WHO, The World Bank, and United Nations (2015). Levels & Trends in Child Mortality. Report 2015: Estimates Developed by the UN Inter-Agency Group for Child Mortality Estimation. *UNICEF*.
- [72] United Nations (2014). *Millennium Development Indicators: World and regional groupings*. Available from <https://mdgs.un.org/unsd/mdg/Host.aspx?Content=Data/RegionalGroupings.htm>.
- [73] United Nations, Department of Economic and Social Affairs, Population Division (2017). *World Population Prospects: The 2017 Revision*. Available from <http://esa.un.org/unpd/wpp/Download/Standard/Population/>.
- [74] United Nations Population Fund (2015). *Population Situation Analysis (PSA): Georgia 2014 Final Report*. page 103. Available from https://georgia.unfpa.org/sites/default/files/pub-pdf/PSA%20_Final%20Print%20version_0.pdf.
- [75] Venero Fernández, S. J., Medina, R. S., Britton, J., and Fogarty, A. W. (2011). The association between living through a prolonged economic depression and the male: female birth ratio—a longitudinal study from Cuba, 1960–2008. *American Journal of Epidemiology*, 174(12):1327–1331.
- [76] World Bank (1978). *World Development Report*. Available from <https://openknowledge.worldbank.org/handle/10986/5961>.
- [77] World Bank (2014). *World Bank Country and Lending Groups, historical classification by income*. Available from <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.
- [78] Yadav, A. K. and Ram, F. (2015). Assessment of Completeness of Birth Registrations (5+) by Sample Registration System (SRS) of India and Major States. *Demography India*, 44(1&2):111–118.
- [79] Yount, K. M. (2003). Provider bias in the treatment of diarrhea among boys and girls attending public facilities in Minia, Egypt. *Social Science & Medicine*, 56(4):753–768.
- [80] Yount, K. M., Langsten, R., and Hill, K. (2000). The effect of gender preference on contraceptive use and fertility in rural Egypt. *Studies in Family Planning*, 31(4):290–300.
- [81] Zhou, Y. and Zheng, Z. (2005). Sex ratio of reported births between 1910 and 1969 in China. CEPED-CICRED-INED Seminar on Female Deficit in Asia: Trends and Perspectives, Singapore.

9 Supplementary Tables

Table 13: **Countries identified with high desired sex ratio at birth (DSRB).** The number of DSRB data points above 1.20 is given before the brackets, the total number of DSRB data points available for each country is inside the brackets.

Country	# DSRB>1.20 (Total #)	Year (when DSRB>1.20)	Maximum DSRB
Afghanistan	1 (1)	2015	1.343
Bangladesh	2 (7)	1994; 1997	1.251
Egypt	1 (8)	1993	1.202
Gambia	1 (1)	2013	1.235
India	3 (4)	1993; 1999; 2006	1.436
Jordan	1 (6)	1990	1.201
Mali	1 (5)	1987	1.249
Mauritania	1 (1)	2000	1.333
Nepal	5 (5)	1996; 2001; 2006; 2011; 2016	1.512
Pakistan	2 (2)	2006; 2013	1.399
Senegal	8 (8)	1986; 2005; 2011; 2013; 2014; 2015; 2016; 2017	1.376

Table 14: **Countries not identified to have high desired sex ratio at birth (DSRB).** The number of DSRB data points above 1.20 is given before the brackets, the total number of DSRB data points available for each country is inside the brackets.

Country	# DSRB>1.20 (Total #)	DSRB Year	Mean DSRB
Albania	0 (1)	2009	1.079
Angola	0 (1)	2016	0.999
Armenia	0 (4)	2000; 2005; 2010; 2016	1.080
Azerbaijan	0 (1)	2006	1.144
Benin	0 (4)	1996; 2001; 2006; 2012	1.061
Bolivia (Plurinational State of)	0 (4)	1994; 1998; 2003; 2008	1.068
Brazil	0 (1)	1996	0.954
Burkina Faso	0 (3)	1999; 2003; 2010	1.148
Burundi	0 (2)	2010; 2016	1.079
Cambodia	0 (4)	2000; 2005; 2010; 2014	0.899
Cameroon	0 (3)	1998; 2004; 2011	1.016
Central African Republic	0 (1)	1994	0.939
Chad	0 (3)	1997; 2004; 2015	1.117
Colombia	0 (5)	1995; 2000; 2005; 2010; 2015	0.929
Comoros	0 (1)	2012	1.052
Republic of the Congo	0 (2)	2005; 2011	0.964
Democratic Republic of the Congo	0 (2)	2007; 2013	1.029
Cote d'Ivoire	0 (2)	1998; 2012	0.991
Dominican Republic	0 (7)	1996; 1999; 2002; 2007; 2007; 2013; 2013	0.808
Ethiopia	0 (4)	2000; 2005; 2011; 2016	1.135
Gabon	0 (2)	2000; 2012	0.945
Ghana	0 (5)	1993; 1999; 2003; 2008; 2014	1.037
Guatemala	0 (3)	1995; 1999; 2015	1.034
Guinea	0 (3)	1999; 2005; 2012	1.138

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Country	# DSRB>1.20 (total #)	DSRB Year	Mean DSRB
Guyana	0 (1)	2009	1.008
Haiti	0 (3)	2000; 2006; 2012	0.878
Honduras	0 (2)	2006; 2012	0.991
Indonesia	0 (7)	1987; 1991; 1994; 1997; 2003; 2007; 2012	1.005
Kazakhstan	0 (2)	1995; 1999	0.988
Kenya	0 (6)	1989; 1993; 1998; 2003; 2009; 2014	1.039
Kyrgyz Republic	0 (2)	1997; 2012	1.014
Lesotho	0 (3)	2004; 2009; 2014	1.025
Liberia	0 (2)	2007; 2013	0.973
Madagascar	0 (3)	1997; 2004; 2009	1.031
Malawi	0 (4)	2000; 2004; 2010; 2015	0.958
Maldives	0 (1)	2009	1.035
Morocco	0 (1)	2003	1.008
Mozambique	0 (3)	1997; 2003; 2011	0.990
Myanmar	0 (1)	2016	1.041
Namibia	0 (3)	2000; 2007; 2013	0.949
Nicaragua	0 (2)	1998; 2001	0.907
Niger	0 (3)	1998; 2006; 2012	1.121
Nigeria	0 (4)	1999; 2003; 2008; 2013	1.100
Peru	0 (7)	1996; 2000; 2006; 2009; 2010; 2011; 2012	0.984
Philippines	0 (5)	1998; 2003; 2008; 2013; 2017	0.967
Rwanda	0 (5)	2000; 2005; 2008; 2010; 2015	1.089
Sao Tome and Principe	0 (1)	2008	0.955
Sierra Leone	0 (2)	2008; 2013	0.998
Swaziland	0 (1)	2006	1.094
Tajikistan	0 (2)	2012; 2017	1.096
Tanzania	0 (4)	1996; 2004; 2010; 2015	1.012
Timor-Leste	0 (2)	2009; 2016	1.004
Togo	0 (3)	1988; 1998; 2014	0.999
Tunisia	0 (1)	1988	1.153
Turkey	0 (2)	1998; 2004	1.037
Uganda	0 (5)	1995; 2000; 2006; 2011; 2016	0.964
Ukraine	0 (1)	2007	0.925
Uzbekistan	0 (1)	1996	1.042
Vietnam	0 (2)	1997; 2002	1.071
Yemen	0 (1)	2013	1.024
Zambia	0 (3)	1996; 2002; 2007	0.961
Zimbabwe	0 (5)	1994; 1999; 2005; 2010; 2015	0.998

Table 15: **Countries identified with high sex ratio at last birth (SRLB).** The number of SRLB data > 1.30 is given before the brackets, the total number of SRLB data available for each country is given inside the brackets. “High SRLB period” refers to the reference period where $\text{SRLB} > 1.30$, the earliest year with SRLB data is inside brackets.

Country	# SRLB>1.30 (Total #)	High SRLB Period (Earliest Data)	Mean SRLB for High Period
Albania	6 (6)	1988–2007 (1988)	1.477
Armenia	13 (18)	1985–2009 (1980)	1.542
Azerbaijan	5 (5)	1990–2005 (1990)	1.465
Bangladesh	16 (78)	1978–2006 (1973)	1.422
Egypt	27 (84)	1974–2014 (1968)	1.376
India	56 (73)	1974–2016 (1974)	1.432
Jordan	17 (34)	1982–2012 (1971)	1.501
Morocco	5 (35)	1967–1983 (1967)	1.682
Nepal	23 (33)	1976–2016 (1976)	1.505
Pakistan	10 (18)	1970–2007 (1970)	1.490
Tajikistan	7 (11)	1997–2013 (1992)	1.404
Turkey	5 (18)	1979–1995 (1976)	1.407
Vietnam	5 (12)	1984–1992 (1981)	1.415

Table 16: **Countries not identified to have high sex ratio at last birth (SRLB).** The number of SRLB data points > 1.30 is given before brackets, the total number of SRLB data points available for each country is inside the brackets.

Country	# SRLB>1.30 (Total #)	SRLB Data Period	Mean SRLB
Afghanistan	0 (6)	2014–2016	1.089
Angola	0 (15)	1987–2016	0.890
Benin	3 (25)	1980–2012	1.071
Bolivia (Plurinational State of)	1 (39)	1970–2008	1.068
Brazil	0 (16)	1967–1996	1.018
Burkina Faso	3 (27)	1974–2010	1.151
Burundi	3 (18)	1971–2017	1.184
Cambodia	0 (42)	1981–2014	0.950
Cameroon	2 (20)	1974–2011	1.200
Central African Republic	0 (5)	1975–1993	0.946
Chad	0 (13)	1980–2014	0.901
Colombia	0 (51)	1969–2015	0.989
Comoros	1 (8)	1979–2010	0.885
Republic of the Congo	1 (8)	1988–2010	1.105
Democratic Republic of the Congo	2 (10)	1987–2013	1.104
Cote d’Ivoire	3 (18)	1975–2011	1.116
Dominican Republic	2 (41)	1970–2011	0.946
Ecuador	0 (5)	1969–1986	1.011
El Salvador	0 (5)	1969–1984	1.057
Ethiopia	2 (22)	1983–2015	1.119
Gabon	1 (9)	1980–2010	0.955
Gambia	0 (4)	1996–2011	0.868
Ghana	1 (40)	1972–2014	0.970
Guatemala	1 (23)	1970–2015	1.048
Guinea	2 (13)	1980–2011	1.132

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Table 16 – continued from previous page

Country	# SRLB>1.30 (Total #)	SRLB Data Period	Mean SRLB
Guyana	0 (10)	1985–2014	0.969
Haiti	1 (32)	1974–2017	0.980
Honduras	0 (17)	1988–2012	1.071
Indonesia	0 (66)	1970–2012	1.041
Kazakhstan	0 (8)	1978–1997	1.062
Kenya	3 (42)	1973–2014	1.103
Kyrgyz Republic	1 (8)	1980–2010	1.177
Lesotho	0 (17)	1985–2014	1.042
Liberia	2 (17)	1969–2012	1.210
Madagascar	3 (23)	1975–2009	1.073
Malawi	0 (37)	1977–2016	0.982
Maldives	0 (5)	1989–2008	0.921
Mali	3 (24)	1970–2012	1.117
Mauritania	1 (5)	1980–2000	1.132
Mexico	2 (5)	1968–1986	1.343
Republic of Moldova	0 (5)	1987–2003	0.982
Mozambique	0 (17)	1980–2014	0.988
Myanmar	0 (7)	1995–2015	1.070
Namibia	1 (23)	1975–2013	0.982
Nicaragua	0 (15)	1980–2001	1.018
Niger	1 (16)	1976–2010	1.004
Nigeria	0 (29)	1973–2013	1.003
Paraguay	0 (5)	1970–1989	0.893
Peru	1 (88)	1966–2012	1.028
Philippines	0 (48)	1973–2017	1.061
Rwanda	1 (41)	1974–2015	1.044
Sao Tome and Principe	0 (4)	1992–2007	0.933
Senegal	5 (45)	1969–2016	1.060
Sierra Leone	1 (11)	1991–2013	0.979
South Africa	0 (7)	1979–1998	1.030
Sri Lanka	0 (6)	1971–1986	1.093
Sudan	0 (5)	1971–1989	0.934
Swaziland	0 (5)	1990–2006	1.175
Tanzania	4 (30)	1971–2015	1.076
Thailand	0 (6)	1970–1986	1.110
Timor-Leste	1 (11)	1991–2015	1.061
Togo	1 (15)	1972–2013	1.043
Trinidad and Tobago	0 (5)	1967–1986	0.991
Tunisia	1 (6)	1969–1988	1.215
Uganda	3 (36)	1969–2016	1.084
Ukraine	1 (5)	1987–2005	1.177
Uzbekistan	0 (5)	1976–1995	1.103
Yemen	2 (14)	1971–2013	1.094
Zambia	1 (27)	1976–2014	0.988
Zimbabwe	2 (34)	1968–2015	1.088

Table 17: **Regional grouping and SRB data availability by country.** “ENAN”: the combination of Europe, North America, Australia, and New Zealand.

Region	Major Ethnic/Ethno-linguistic Groups	[202] Country with Data	[10] Country without Data
southern Asia [9]	Indian; Pakistan; Dravidians; Indo-Aryans; Munda peoples	[9] Afghanistan; Bangladesh; Bhutan; India; Iran (Islamic Republic of); Maldives; Nepal; Pakistan; Sri Lanka	[0] –
ENAN [47]	Russians; Germans; French; British; Italians; Spanish; Ukrainians; Poles	[47] Albania; Andorra; Australia; Austria; Belarus; Belgium; Bosnia and Herzegovina; Bulgaria; Canada; Channel Islands; Croatia; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Latvia; Lithuania; Luxembourg; Macedonia; Malta; Republic of Moldova; Monaco; Montenegro; Netherlands; New Zealand; Norway; Poland; Portugal; Romania; Russian Federation; San Marino; Serbia; Slovakia; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States of America; Ukraine	[0] –
northern Africa [6]	Maghrebis; Egyptians	[5] Algeria; Egypt; Libya; Morocco; Tunisia	[1] Western Sahara
sub-Saharan Africa [51]	Luba; Mongo; Kongo; Kanuri; Oromo; Amhara; Somali; Hutu; Chewa; shona; Zulu; Xitsonga; Yoruba; Igbo; Hausa; Mande peoples; Akan; Fulbe	[47] Angola; Benin; Burkina Faso; Burundi; Cameroon; Cape Verde; Central African Republic; Chad; Comoros; Republic of the Congo; Democratic Republic of the Congo; Cote d'Ivoire; Djibouti; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mauritius; Mozambique; Namibia; Niger; Nigeria; Reunion; Rwanda; Sao Tome and Principe; Senegal; Seychelles; Sierra Leone; Somalia; South Africa; South Sudan; Sudan; Swaziland; Tanzania; Togo; Uganda; Zambia; Zimbabwe	[4] Botswana; Equatorial Guinea; Eritrea; Mayotte

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Region	Major Ethnic/Ethno-linguistic Groups	[202] Country with Data	[10] Country without Data
Latin America and the Caribbean [40]	Mexicans; Mestizos; Caucasians; Native Americans; Afro Central Americans; Marranos; Afro-Caribbean	[40] Antigua and Barbuda; Argentina; Aruba; Bahamas; Barbados; Belize; Bolivia (Plurinational State of); Brazil; Chile; Colombia; Costa Rica; Cuba; Curacao; Dominica; Dominican Republic; Ecuador; El Salvador; French Guiana; Grenada; Guadeloupe; Guatemala; Guyana; Haiti; Honduras; Jamaica; Martinique; Mexico; Nicaragua; Panama; Paraguay; Peru; Puerto Rico; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Trinidad and Tobago; Uruguay; United States Virgin Islands; Venezuela (Bolivarian Republic of)	[0] –
western Asia [15]	Arabs; Jews; Samaritans; Druze; Semites; Iranian peoples; Turkmen; Turks	[15] Arab Emirates; Bahrain; Cyprus; Iraq; Israel; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; State of Palestine; Syria; Turkey; Yemen	[0] –
Caucasus and central Asia [8]	Turkic peoples; Iranian peoples; Mongols; Russians; Peoples of the Caucasus	[8] Armenia; Azerbaijan; Georgia; Kazakhstan; Kyrgyz Republic; Tajikistan; Turkmenistan; Uzbekistan	[0] –
southeastern Asia [11]	Tai-Kadai; Austronesian peoples; Negrito peoples; Sino-Tibetan; Austro-Asiatic; Indo-Aryan and Dravidian	[11] Brunei; Cambodia; Indonesia; Laos; Malaysia; Myanmar; Philippines; Singapore; Thailand; Timor-Leste; Vietnam	[0] –
eastern Asia [8]	Chinese; Sino-Tibetan peoples; Japanese; Korean	[8] China; Macao (China); Hong Kong (China); Japan; Democratic People's Republic of Korea; Republic of Korea; Mongolia; Taiwan (China)	[0] –
Oceania [17]	Polynesians; Melanesians; Micronesians; Papuans; Australian Aborigines; Europeans	[12] Cook Islands; Fiji; French Polynesia; Guam; Marshall Islands; Nauru; New Caledonia; Niue; Palau; Samoa; Tonga; Tuvalu	[5] Kiribati; Micronesia; Papua New Guinea; Solomon Islands; Vanuatu

Table 18: **Information availability for the selection of countries with potential SRB inflation.** For countries in the first column, data are available on the SRLB and DSRB, or the country is mentioned in the literature, as per selection criteria in Section 2.1. Other countries are those without any external information on the existence of son preference and/or sex-selective abortion, broken down into countries with and without VR coverage for 1970–2017.

Region	[90] Countries with Information on SRLB/DSRB and/or Literature	[122] Other Countries	
		[65] VR Coverage	[57] No Information
southern Asia	[7] Afghanistan; Bangladesh; India; Maldives; Nepal; Pakistan; Sri Lanka	[1] Iran (Islamic Republic of)	[1] Bhutan
ENAN	[4] Albania; Republic of Moldova; Montenegro; Ukraine	[34] Australia; Austria; Belarus; Belgium; Bulgaria; Canada; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Latvia; Lithuania; Luxembourg; Netherlands; New Zealand; Norway; Poland; Portugal; Romania; Russian Federation; Slovakia; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States of America	[9] Andorra; Bosnia and Herzegovina; Channel Islands; Croatia; Macedonia; Malta; Monaco; San Marino; Serbia
northern Africa	[3] Egypt; Morocco; Tunisia	[2] Algeria; Libya	[1] Western Sahara
sub-Saharan Africa	[39] Angola; Benin; Burkina Faso; Burundi; Central African Republic; Cameroon; Chad; Comoros; Republic of the Congo; Democratic Republic of the Congo; Cote d'Ivoire; Ethiopia; Gabon; Gambia; Ghana; Guinea; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mozambique; Namibia; Niger; Nigeria; Rwanda; Sao Tome and Principe; Senegal; Sierra Leone; South Africa; Sudan; Swaziland; Tanzania; Togo; Uganda; Zambia; Zimbabwe	[2] Mauritius; Seychelles	[10] Botswana; Cape Verde; Djibouti; Equatorial Guinea; Eritrea; Guinea-Bissau; Mayotte; Reunion; Somalia; South Sudan

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Region	[90] Countries with Information on SRLB/DSRB and/or Literature	[122] Other Countries	
		[65] VR Coverage	[57] No Information
Latin America and the Caribbean	[15] Bolivia (Plurinational State of); Brazil; Colombia; Dominican Republic; Ecuador; El Salvador; Guatemala; Guyana; Haiti; Honduras; Mexico; Nicaragua; Paraguay; Peru; Trinidad and Tobago	[13] Argentina; Bahamas; Barbados; Chile; Costa Rica; Cuba; French Guiana; Panama; Puerto Rico; Saint Lucia; Saint Vincent and the Grenadines; Uruguay; Venezuela (Bolivarian Republic of)	[12] Antigua and Barbuda; Aruba; Belize; Curaçao; Dominica; Grenada; Guadeloupe; Jamaica; Martinique; Saint Kitts and Nevis; Suriname; United States Virgin Islands
western Asia	[3] Jordan; Turkey; Yemen	[4] Bahrain; Israel; Kuwait; Qatar	[8] Arab Emirates; Cyprus; Iraq; Lebanon; Oman; Saudi Arabia; State of Palestine; Syria
Caucasus and central Asia	[7] Armenia; Azerbaijan; Georgia; Kazakhstan; Kyrgyz Republic; Tajikistan; Uzbekistan	[0] –	[1] Turkmenistan
southeastern Asia	[8] Cambodia; Indonesia; Myanmar; Philippines; Singapore; Thailand; Timor-Leste; Vietnam	[2] Brunei; Malaysia	[1] Laos
eastern Asia	[4] China; Hong Kong, SAR of China; Republic of Korea; Taiwan, Province of China	[3] Macao, SAR of China; Japan; Mongolia	[1] Democratic People's Republic of Korea
Oceania	[0] –	[4] Fiji; Guam; New Caledonia; Tonga	[13] Cook Islands; French Polynesia; Kiribati; Marshall Islands; Micronesia; Nauru; Niue; Palau; Papua New Guinea; Samoa; Solomon Islands; Tuvalu; Vanuatu

Table 19: **SRB data sources, by country.** For each country, the total number of observations and the most recent reference year are shown after the country name. For each country-specific data series, the number of observations and the most recent reference year within that series are shown before each data series name. The source type that each data series falls in is shown in parentheses after each data series name.

Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Afghanistan	36	2015.5	
	1	1979.5	1979 Census [Census Direct]
	19	2010.5	2010 Special Demographic and Health Survey [Other DHS Direct]
	16	2015.5	2015 Standard Demographic and Health Survey [DHS Direct]
Albania	43	2015.5	
	3	2000	2002 Reproductive Health Survey [Other DHS Direct]
	4	2006	2008–2009 Standard Demographic and Health Survey [DHS Direct]
	36	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Algeria	61	2016.5	
	10	1991.5	1992 Pan Arab Project for Child Development [Other DHS Direct]
	10	2001.5	2002–2003 Pan Arab Project for Family Health [Other DHS Direct]
	12	2012.5	2012–2013 Multiple Indicator Cluster Survey [Other DHS Direct]
	29	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Andorra	15	2014.5	
	15	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Angola	20	2016	
	2	2006	2006–2007 DHS Malaria Indicator Survey [Other DHS Direct]
	9	2010.5	2011 DHS Malaria Indicator Survey [Other DHS Direct]
	9	2016	2015–2016 Standard Demographic and Health Survey [DHS Direct]
Antigua and Barbuda	12	1995	
	12	1995	Vital Registration (United Nations Demographic Yearbook) [VR]
	27	2015.5	
Arab Emirates	27	2015.5	
	27	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Argentina	58	2015.5	
	58	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Armenia	36	2015.5	
	3	1998.5	2000 Standard Demographic and Health Survey [DHS Direct]
	3	2001	2005 Standard Demographic and Health Survey [DHS Direct]
	2	2004.5	2010 Standard Demographic and Health Survey [DHS Direct]
	3	2014	2015–2016 Standard Demographic and Health Survey [DHS Direct]
	25	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Aruba	17	2016	
	17	2016	Vital Registration (United Nations Demographic Yearbook) [VR]
Australia	92	2015.5	
	3	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	89	2009.5	Vital Registration (Human Mortality Database) [VR]
Austria	145	2015.5	
	5	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	140	2010.5	Vital Registration (Human Mortality Database) [VR]
Azerbaijan	28	2015.5	
	4	2004.5	2006 Standard Demographic and Health Survey [DHS Direct]
	24	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Bahamas	56	2014.5	
	56	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Bahrain	44	2014.5	
	44	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Bangladesh	118	2013.5	

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
	9	1976	1975–1976 World Fertility Survey [Other DHS Direct]
	1	1980.5	1980 Base Line Demographic Survey [Others Direct]
	11	1993.5	1993–1994 Standard Demographic and Health Survey [DHS Direct]
	10	1996.5	1996–1997 Standard Demographic and Health Survey [DHS Direct]
	10	1999.5	1999–2000 Standard Demographic and Health Survey [DHS Direct]
	21	2001.5	2001 Special Demographic and Health Survey [Other DHS Direct]
	10	2003.5	2004 Standard Demographic and Health Survey [DHS Direct]
	9	2006.5	2007 Standard Demographic and Health Survey [DHS Direct]
	11	2011	2011 Standard Demographic and Health Survey [DHS Direct]
	9	2013.5	2014 Standard Demographic and Health Survey [DHS Direct]
	17	2011.5	Sampling Registration System [VR]
Barbados	54	2007.5	
	54	2007.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Belarus	58	2016.5	
	2	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	56	2016.5	Vital Registration (Human Mortality Database) [VR]
Belgium	176	2015.5	
	3	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	173	2012.5	Vital Registration (Human Mortality Database) [VR]
Belize	12	2013.5	
	6	1990.5	1991 Reproductive Health Survey [Other DHS Direct]
	3	1998	1999 Reproductive Health Survey [Other DHS Direct]
	3	2013.5	2015–2016 Multiple Indicator Cluster Survey [Other DHS Direct]
Benin	75	2014	
	6	1981.5	1981–1982 World Fertility Survey [Other DHS Direct]
	9	1996	1996 Standard Demographic and Health Survey [DHS Direct]
	1	2000.5	2000 Knowledge, Attitude and Practice survey (Borgou-Alibori) [Others Direct]
	9	2001	2001 Standard Demographic and Health Survey [DHS Direct]
	1	2002.5	2002 Census [Census Direct]
	19	2006.5	2006 Standard Demographic and Health Survey [DHS Direct]
	17	2012	2011–2012 Standard Demographic and Health Survey [DHS Direct]
	13	2014	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
Bhutan	5	2005.5	
	1	1983.5	1984 Health Survey [Others Direct]
	1	1993.2	1994 National Health Survey [Others Direct]
	1	1999.5	2000 National Health Survey [Others Direct]
	2	2005.5	2005 Census [Census Direct]
Bolivia (Pluri-national of)	45	2008	
	7	1988.5	1989 Standard Demographic and Health Survey [DHS Direct]
	9	1993.5	1994 Standard Demographic and Health Survey [DHS Direct]
	9	1997.5	1998 Standard Demographic and Health Survey [DHS Direct]
	10	2003.5	2003 Standard Demographic and Health Survey [DHS Direct]
	10	2008	2008 Standard Demographic and Health Survey [DHS Direct]
Bosnia and Herzegovina	20	2014.5	
	20	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Botswana	0	–	–
Brazil	19	1995.5	
	6	1985.5	1986 Standard Demographic and Health Survey [DHS Direct]
	4	1990.5	1991 Standard Demographic and Health Survey [DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Brunei	9	1995.5	1996 Standard Demographic and Health Survey [DHS Direct]
Bulgaria	63	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Burkina Faso	69	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	5	2015.5	Vital Registration (Human Mortality Database) [VR]
	64	2010.5	
Burundi	51	2014	
Cote d'Ivoire	1	1991	1991 Demographic Survey [Others Direct]
	8	1992.5	1993 Standard Demographic and Health Survey [DHS Direct]
	9	1998.5	1998–1999 Standard Demographic and Health Survey [DHS Direct]
	10	2003	2003 Standard Demographic and Health Survey [DHS Direct]
	2	2006.5	2006 Census [Census Direct]
	18	2010.5	2010 Standard Demographic and Health Survey [DHS Direct]
	3	2014	2014 DHS Malaria Indicator Survey [Other DHS Direct]
Cambodia	32	2017	
Cameroon	40	2016	
	8	1980.5	1980–1981 World Fertility Survey [Other DHS Direct]
	9	1994	1994 Standard Demographic and Health Survey [DHS Direct]
	3	1996.5	1998–1999 Standard Demographic and Health Survey [DHS Direct]
	3	2003	2005 Standard DHS AIDS Indicator Survey [Other DHS Direct]
	7	2011.5	2011–2012 Standard Demographic and Health Survey [DHS Direct]
	1	2014.5	2014 Census [Census Direct]
	9	2016	2016 Multiple Indicator Cluster Survey [Other DHS Direct]
Canada	47	2013.5	
Cape Verde	8	1997.5	1998 Special Demographic and Health Survey [Other DHS Direct]
	10	1999.5	2000 Standard Demographic and Health Survey [DHS Direct]
	10	2005.5	2005 Standard Demographic and Health Survey [DHS Direct]
	10	2010	2010 Standard Demographic and Health Survey [DHS Direct]
	9	2013.5	2014 Standard Demographic and Health Survey [DHS Direct]
Central African Republic	48	2013.5	
Chad	7	1978	1978 World Fertility Survey [Other DHS Direct]
	5	1990	1991 Standard Demographic and Health Survey [DHS Direct]
	6	1997.5	1998 Standard Demographic and Health Survey [DHS Direct]
	10	2004	2004 Standard Demographic and Health Survey [DHS Direct]
	11	2011	2011 Standard Demographic and Health Survey [DHS Direct]
	9	2013.5	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	93	2013.5	
	4	2013.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	89	2009.5	Vital Registration (Human Mortality Database) [VR]
	23	2000.5	
	10	1998	1998 Reproductive Health Survey [Other DHS Direct]
	13	2000.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	8	1994.5	
	8	1994.5	1994–1995 Standard Demographic and Health Survey [DHS Direct]
	31	2015	
	9	1997	1996–1997 Standard Demographic and Health Survey [DHS Direct]
	6	2004	2004 Standard Demographic and Health Survey [DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Channel Islands	16	2015	2014–2015 Standard Demographic and Health Survey [DHS Direct]
	25	1994.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	25	1994.5	Vital Registration (Human Mortality Database) [VR]
Chile	108	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	9	2014.5	Vital Registration (Human Mortality Database) [VR]
	99	2005.5	Vital Registration (Human Mortality Database) [VR]
China	109	2016.8	
	1	1953.5	1953 Census – Population by age and sex [Census Direct]
	1	1964.5	1964 Census – Population by age and sex [Census Direct]
	1	1976	1976 Education statistics – Administrative records [Others Direct]
	1	1977	1977 Education statistics – Administrative records [Others Direct]
	1	1978	1978 Education statistics – Administrative records [Others Direct]
	1	1979	1979 Education statistics – Administrative records [Others Direct]
	1	1980	1980 Education statistics – Administrative records [Others Direct]
	1	1981	1981 Education statistics – Administrative records [Others Direct]
	1	1982.5	1982 Census – Population by age and sex [Census Direct]
	1	1982	1982 Census – Recent births (Short form) [Census Direct]
	1	1982	1982 Education statistics – Administrative records [Others Direct]
	19	1982	1982 National One-per-Thousand-Population Sample Survey on Fertility – Birth Histories data [Others Direct]
	1	1983	1983 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1983	1983 Education statistics – Administrative records [Others Direct]
	1	1983.5	1984 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1984	1984 Education statistics – Administrative records [Others Direct]
	1	1984.5	1985 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1985	1985 Education statistics – Administrative records [Others Direct]
	1	1985.5	1986 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1986	1986 Education statistics – Administrative records [Others Direct]
	1	1986.5	1987 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1987	1987 Education statistics – Administrative records [Others Direct]
	1	1987.5	1987 One-per-Hundred National Population Survey – Population by age and sex [Others Direct]
	1	1987	1987 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1987.5	1988 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1988	1988 Education statistics – Administrative records [Others Direct]
	15	1987	1988 National Two-per-Thousand-Population Sample Survey on Fertility and Contraceptives – Birth Histories data (reconstructed) [Others Direct]
	1	1988.5	1989 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1989	1989 Education statistics – Administrative records [Others Direct]
	1	1990.3	1990 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1990.5	1990 Census – Population by age and sex [Census Direct]
	1	1990	1990 Census – Recent births [Census Direct]
	1	1990	1990 Education statistics – Administrative records [Others Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
	1	1991.3	1991 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1991	1991 Education statistics – Administrative records [Others Direct]
	1	1992.3	1992 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1992	1992 Education statistics – Administrative records [Others Direct]
	1	1992.3	1992 National Fertility and Family Planning Survey – Recent births [Others Direct]
	1	1993.3	1993 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1993	1993 Education statistics – Administrative records [Others Direct]
	1	1994.3	1994 Annual Population Change Survey (1% _{oo} Survey) – Recent births [Others Direct]
	1	1994	1994 Education statistics – Administrative records [Others Direct]
	1	1995	1995 Education statistics – Administrative records [Others Direct]
	1	1995.8	1995 One-percent Sample Survey – Population by age and sex [Others Direct]
	1	1995.2	1995 One-percent Sample Survey – Recent births [Others Direct]
	1	1996.5	1996 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	1996	1996 Education statistics – Administrative records [Others Direct]
	1	1997.5	1997 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	1997	1997 Education statistics – Administrative records [Others Direct]
	1	1998.5	1998 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	1998	1998 Education statistics – Administrative records [Others Direct]
	1	1999.5	1999 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	1999	1999 Education statistics – Administrative records [Others Direct]
	1	2000.8	2000 Census – Population by age and sex [Census Direct]
	1	2000.3	2000 Census – Recent births (long form) [Census Direct]
	1	2000.3	2000 Census – Recent births (Short form) [Census Direct]
	1	2000	2000 Education statistics – Administrative records [Others Direct]
	1	2001.5	2001 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2001	2001 Education statistics – Administrative records [Others Direct]
	1	2002.5	2002 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2002	2002 Education statistics – Administrative records [Others Direct]
	1	2003	2003 Education statistics – Administrative records [Others Direct]
	1	2004.8	2004 Annual Population Change Survey (1% _{oo} Survey) – Direct (complete age distribution from abridged age groups - pchip) [Others Direct]
	1	2005.8	2005 One-percent Sample Survey – Direct (complete age distribution from abridged age groups - pchip) [Others Direct]
	1	2005.3	2005 One-percent Sample Survey – Recent births [Others Direct]
	1	2006.8	2006 Annual Population Change Survey (1% _{oo} Survey) – Direct (complete age distribution from abridged age groups - pchip) [Others Direct]
	1	2008.8	2008 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2009.8	2009 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2010	2010 Census – Population by age and sex [Census Direct]

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Table 19 – continued from previous page

Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Colombia	1	2010.3	2010 Census – Recent births (Long Form) [Census Direct]
	1	2010.3	2010 Census – Recent births (Short Form) [Census Direct]
	1	2011.8	2011 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2012.8	2012 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2013.8	2013 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2014.8	2014 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2015.8	2015 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	1	2016.8	2016 Annual Population Change Survey (1% _{oo} Survey) – Population by age and sex [Others Direct]
	72	2015	
	7	1975.5	1976 World Fertility Survey [Other DHS Direct]
Comoros	5	1985	1986 Standard Demographic and Health Survey [DHS Direct]
	4	1988.5	1990 Standard Demographic and Health Survey [DHS Direct]
	8	1994.5	1995 Standard Demographic and Health Survey [DHS Direct]
	8	1999.5	2000 Standard Demographic and Health Survey [DHS Direct]
	12	2005	2005 Standard Demographic and Health Survey [DHS Direct]
	20	2010	2010 Standard Demographic and Health Survey [DHS Direct]
	8	2015	2015 Standard Demographic and Health Survey [DHS Direct]
	8	2010.5	
Republic of the Congo	4	1994.5	1996 Standard Demographic and Health Survey [DHS Direct]
	4	2010.5	2012 Standard Demographic and Health Survey [DHS Direct]
	17	2014	
Democratic Republic of the Congo	5	2004.5	2005 Standard Demographic and Health Survey [DHS Direct]
	6	2011.5	2011–2012 Standard Demographic and Health Survey [DHS Direct]
	6	2014	2014–2015 Multiple Indicator Cluster Survey [Other DHS Direct]
Democratic Republic of the Congo	19	2014	
	6	2006.5	2007 Standard Demographic and Health Survey [DHS Direct]
	13	2014	2013–2014 Standard Demographic and Health Survey [DHS Direct]
Cook Islands	14	2012.5	
	14	2012.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Costa Rica	48	2016.5	
	6	1975	1976 World Fertility Survey [Other DHS Direct]
	42	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Croatia	29	2016.5	
	28	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	1	2016.5	Vital Registration (Human Mortality Database) [VR]
Cuba	61	2016.5	
	61	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Curacao	16	2016.5	
	16	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Cyprus	40	1989.5	
	40	1989.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Czech Republic	70	2016.5	
	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Denmark	66	2016.5	Vital Registration (Human Mortality Database) [VR]
	182	2016.5	
	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Djibouti	178	2016.5	Vital Registration (Human Mortality Database) [VR]
	7	2011.5	
	2	1996.5	1996 Enquête Djiboutienne auprès des Ménages - Indicateurs sociaux [Others Direct]
	3	2000.5	2002 Pan Arab Project for Family Health [Other DHS Direct]
	1	2006.5	2006 Multiple Indicator Cluster Survey [Others Direct]
Dominica	1	2011.5	2011 Multiple Indicator Cluster Survey [Others Direct]
	10	2006	
Dominican Republic	10	2006	Vital Registration (United Nations Demographic Yearbook) [VR]
	67	2014	
Ecuador	4	1974	1975 World Fertility Survey [Other DHS Direct]
	6	1979	1980 World Fertility Survey [Other DHS Direct]
	6	1985.5	1986 Standard Demographic and Health Survey [DHS Direct]
	4	1990	1991 Standard Demographic and Health Survey [DHS Direct]
	7	1995.5	1996 Standard Demographic and Health Survey [DHS Direct]
	1	1992.5	1999 Standard Demographic and Health Survey [DHS Direct]
	11	2002	2002 Standard Demographic and Health Survey [DHS Direct]
	2	2002	2007 Special Demographic and Health Survey [Other DHS Direct]
	10	2006.5	2007 Standard Demographic and Health Survey [DHS Direct]
	2	2007.5	2013 Special Demographic and Health Survey [Other DHS Direct]
	4	2011.5	2013 Standard Demographic and Health Survey [DHS Direct]
	10	2014	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	47	2003.5	
	6	1978	1979–1980 World Fertility Survey [Other DHS Direct]
Egypt	6	1986	1987 Standard Demographic and Health Survey [DHS Direct]
	8	1989	1989 Reproductive Health Survey [Other DHS Direct]
	10	1994	1994 Reproductive Health Survey [Other DHS Direct]
	10	1999	1999 Reproductive Health Survey [Other DHS Direct]
	7	2003.5	2004 Reproductive Health Survey [Other DHS Direct]
	187	2014.5	
El Salvador	13	1980	1980 World Fertility Survey [Other DHS Direct]
	12	1988.5	1988 Standard Demographic and Health Survey [DHS Direct]
	16	1991	1991 Pan Arab Project for Child Development [Other DHS Direct]
	11	1992.5	1992 Standard Demographic and Health Survey [DHS Direct]
	14	1995.5	1995 Standard Demographic and Health Survey [DHS Direct]
	19	2000	2000 Standard Demographic and Health Survey [DHS Direct]
	10	2002.5	2003 Interim Demographic and Health Survey [Other DHS Direct]
	16	2005	2005 Standard Demographic and Health Survey [DHS Direct]
	16	2008	2008 Standard Demographic and Health Survey [DHS Direct]
	15	2014	2014 Standard Demographic and Health Survey [DHS Direct]
	45	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	83	2015.5	
	4	1984.5	1985 Standard Demographic and Health Survey [DHS Direct]
	2	1987	1988 Reproductive Health Survey [Other DHS Direct]
	4	1992	1993 Reproductive Health Survey [Other DHS Direct]
	8	1997.5	1998 Reproductive Health Survey [Other DHS Direct]
	5	2001	2002–2003 Reproductive Health Survey [Other DHS Direct]
	8	2007.5	2008 Reproductive Health Survey [Other DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
	6	2013.5	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	46	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Equatorial Guinea	0	–	–
Eritrea	0	–	–
Estonia	57	2015.5	
	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	53	2011.5	Vital Registration (Human Mortality Database) [VR]
Ethiopia	36	2015.5	
	9	1999.5	2000 Standard Demographic and Health Survey [DHS Direct]
	10	2005	2005 Standard Demographic and Health Survey [DHS Direct]
	8	2010.5	2011 Standard Demographic and Health Survey [DHS Direct]
	9	2015.5	2016 Standard Demographic and Health Survey [DHS Direct]
Fiji	59	2008.5	
	8	1973.5	1974 World Fertility Survey [Other DHS Direct]
	51	2008.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Finland	151	2015.5	
	6	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	145	2009.5	Vital Registration (Human Mortality Database) [VR]
France	210	2015.5	
	3	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	207	2012.5	Vital Registration (Human Mortality Database) [VR]
French Guiana	34	2007.5	
	34	2007.5	Vital Registration (United Nations Demographic Yearbook) [VR]
French Polynesia	11	1972.5	
	11	1972.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Gabon	10	2010.5	
	6	1999.5	2000 Standard Demographic and Health Survey [DHS Direct]
	4	2010.5	2012 Standard Demographic and Health Survey [DHS Direct]
Gambia	9	2013	
	1	1972.8	1973 Census [Census Direct]
	8	2013	2013 Standard Demographic and Health Survey [DHS Direct]
Georgia	23	2016.5	
	23	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Germany	56	2015.5	
	34	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	22	2011.5	Vital Registration (Human Mortality Database) [VR]
Ghana	77	2017	
	8	1979.5	1979–1980 World Fertility Survey [Other DHS Direct]
	7	1987.5	1988 Standard Demographic and Health Survey [DHS Direct]
	6	1993	1993 Standard Demographic and Health Survey [DHS Direct]
	6	1998	1998 Standard Demographic and Health Survey [DHS Direct]
	6	2002.5	2003 Standard Demographic and Health Survey [DHS Direct]
	9	2007	2007 Special Demographic and Health Survey [Other DHS Direct]
	5	2007	2008 Standard Demographic and Health Survey [DHS Direct]
	1	2010.5	2010 Census [Census Direct]
	6	2010.5	2011 Multiple Indicator Cluster Survey [Other DHS Direct]
	7	2013.5	2014 Standard Demographic and Health Survey [DHS Direct]
	2	2014.5	2016 DHS Malaria Indicator Survey [Other DHS Direct]
	14	2017	2017 Special Demographic and Health Survey [Other DHS Direct]
Greece	62	2016.5	
	62	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Grenada	31	2001.5	

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
	31	2001.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Guadeloupe	37	2003.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	37	2003.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Guam	53	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	53	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Guatemala	115	2015	
	7	1986.5	1987 Standard Demographic and Health Survey [DHS Direct]
	10	1995	1995 Standard Demographic and Health Survey [DHS Direct]
	4	1997	1998–1999 Interim Demographic and Health Survey [Other DHS Direct]
	7	2002	2002 Reproductive Health Survey [Other DHS Direct]
	11	2009	2008–2009 Reproductive Health Survey [Other DHS Direct]
	16	2015	2014–2015 Standard Demographic and Health Survey [DHS Direct]
	60	2011.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Guinea	35	2016	
	9	1999	1999 Standard Demographic and Health Survey [DHS Direct]
	9	2004.5	2005 Standard Demographic and Health Survey [DHS Direct]
	9	2012	2012 Standard Demographic and Health Survey [DHS Direct]
	8	2016	2016 Multiple Indicator Cluster Survey [Other DHS Direct]
Guinea-Bissau	8	2013.5	
	8	2013.5	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
Guyana	27	2012.5	
	6	1974.5	1975 World Fertility Survey [Other DHS Direct]
	2	2001	2005 Standard DHS AIDS Indicator Survey [Other DHS Direct]
	4	2006.5	2009 Standard Demographic and Health Survey [DHS Direct]
	3	2012.5	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	12	2012.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Haiti	35	2016.5	
	3	1976	1977 World Fertility Survey [Other DHS Direct]
	6	1994	1994–1995 Standard Demographic and Health Survey [DHS Direct]
	4	1999	2000 Standard Demographic and Health Survey [DHS Direct]
	7	2005.5	2005–2006 Standard Demographic and Health Survey [DHS Direct]
	7	2009	2012 Standard Demographic and Health Survey [DHS Direct]
	8	2016.5	2016–2017 Standard Demographic and Health Survey [DHS Direct]
Honduras	38	2011.5	
	3	1991.5	1991–1992 Reproductive Health Survey [Other DHS Direct]
	7	1995.5	1996 Reproductive Health Survey [Other DHS Direct]
	7	2000.5	2001 Reproductive Health Survey [Other DHS Direct]
	11	2006	2005–2006 Standard Demographic and Health Survey [DHS Direct]
	10	2011.5	2011–2012 Standard Demographic and Health Survey [DHS Direct]
Hong Kong, SAR of China	57	2014.5	
	57	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Hungary	67	2015.5	
	7	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	60	2009.5	Vital Registration (Human Mortality Database) [VR]
Iceland	179	2016.5	
	5	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	174	2016.5	Vital Registration (Human Mortality Database) [VR]
India	129	2016.5	
	35	2016.5	Sampling Registration System – Recent births [VR]
	1	1978.5	1979 Survey on Infant and Child Mortality – Recent births [Others Direct]
	1	1980.7	1981 Census – Recent births [Census Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
India	1	1990.7	1991 Census – Recent births [Census Direct]
	3	1931.5	1992 Dyson T (1992). Infant and Child mortality in the Indian subcontinent, 1881–1947 – Recent births [Others Direct]
	21	1993	1992–1993 Standard Demographic and Health Survey – Full Birth Histories [DHS Direct]
	22	2000	1998–1999 Standard Demographic and Health Survey – Full Birth Histories [DHS Direct]
	1	2000.7	2001 Census – Recent births [Census Direct]
	21	2006	2005–2006 Standard Demographic and Health Survey – Full Birth Histories [DHS Direct]
	1	2006.9	2007–2008 District Level Household Survey – Recent births [Others Direct]
	22	2016.5	2015–2016 Standard Demographic and Health Survey – Full Birth Histories [DHS Direct]
	95	2012	
	10	1975.5	1976 World Fertility Survey [Other DHS Direct]
Indonesia	10	1987	1987 Standard Demographic and Health Survey [DHS Direct]
	16	1991	1991 Standard Demographic and Health Survey [DHS Direct]
	14	1994	1994 Standard Demographic and Health Survey [DHS Direct]
	12	1997	1997 Standard Demographic and Health Survey [DHS Direct]
	11	2002.5	2002–2003 Standard Demographic and Health Survey [DHS Direct]
	10	2007	2007 Standard Demographic and Health Survey [DHS Direct]
	12	2012	2012 Standard Demographic and Health Survey [DHS Direct]
	45	2015.5	
Iran (Islamic Republic of)	1	1973	1973–1976 Population Growth Survey [Others Direct]
	44	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Iraq	37	2011	
	1	1997.3	1997 Census [Census Direct]
	16	2006	2006 Multiple Indicator Cluster Survey [Other DHS Direct]
	19	2011	2011 Multiple Indicator Cluster Survey [Other DHS Direct]
Ireland	1	1984.5	Vital Registration (United Nations Economic and Social Commission for Western Asia) [VR]
	65	2015.5	
	5	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Israel	60	2009.5	Vital Registration (Human Mortality Database) [VR]
	63	2015.5	
Italy	36	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	27	2009.5	Vital Registration (Human Mortality Database) [VR]
Jamaica	151	2015.5	
	3	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	148	2009.5	Vital Registration (Human Mortality Database) [VR]
Japan	42	2007.5	
	5	1975	1975–1976 World Fertility Survey [Other DHS Direct]
	2	1988	1989 Reproductive Health Survey [Other DHS Direct]
	1	1991	1993 Reproductive Health Survey [Other DHS Direct]
	6	1996.5	1997 Reproductive Health Survey [Other DHS Direct]
	6	2002	2002–2003 Reproductive Health Survey [Other DHS Direct]
	3	2006	2008–2009 Reproductive Health Survey [Other DHS Direct]
	19	2007.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Japan	134	2014.5	
	2	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	132	2010.5	Vital Registration (Human Mortality Database) [VR]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Jordan	100	2015.5	
	8	1976	1976 World Fertility Survey [Other DHS Direct]
	11	1990	1990 Standard Demographic and Health Survey [DHS Direct]
	9	1997	1997 Standard Demographic and Health Survey [DHS Direct]
	7	2001.5	2002 Standard Demographic and Health Survey [DHS Direct]
	7	2006.5	2007 Standard Demographic and Health Survey [DHS Direct]
	6	2008.5	2009 Interim Demographic and Health Survey [Other DHS Direct]
	7	2011.5	2012 Standard Demographic and Health Survey [DHS Direct]
	45	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Kazakhstan	32	2013.5	
	2	1992	1995 Standard Demographic and Health Survey [DHS Direct]
	3	1995	1999 Standard Demographic and Health Survey [DHS Direct]
	27	2013.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Kenya	68	2014	
	10	1978	1977–1978 World Fertility Survey [Other DHS Direct]
	7	1988.5	1989 Standard Demographic and Health Survey [DHS Direct]
	8	1992.5	1993 Standard Demographic and Health Survey [DHS Direct]
	9	1997.5	1998 Standard Demographic and Health Survey [DHS Direct]
	8	2002.5	2003 Standard Demographic and Health Survey [DHS Direct]
	6	2008	2008–2009 Standard Demographic and Health Survey [DHS Direct]
	18	2014	2014 Standard Demographic and Health Survey [DHS Direct]
	2	2013.5	2015 DHS Malaria Indicator Survey [Other DHS Direct]
Kiribati Democratic People's Republic of Korea	0	–	–
	1	2008.5	
Republic of Korea	1	2008.5	2008 Census [Census Direct]
	43	2015.5	
	7	1973	1974 World Fertility Survey [Other DHS Direct]
Kuwait	36	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	53	2015.5	
Kyrgyz Republic	53	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	46	2016.5	
	3	1994.5	1997 Standard Demographic and Health Survey [DHS Direct]
	5	2011.5	2012 Standard Demographic and Health Survey [DHS Direct]
	5	2013.5	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
Laos	33	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	35	2017	
	1	2005	2005 Census [Census Direct]
	18	2012	2011–2012 Multiple Indicator Cluster Survey [Other DHS Direct]
Latvia	16	2017	2017 Multiple Indicator Cluster Survey [Other DHS Direct]
	57	2015.5	
	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Lebanon	53	2011.5	Vital Registration (Human Mortality Database) [VR]
	43	2014.5	
	5	1995	1996 Pan Arab Project for Child Development [Other DHS Direct]
Lesotho	4	2002	2004 Pan Arab Project for Family Health [Other DHS Direct]
	34	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	19	2013	
	5	1976.5	1977 World Fertility Survey [Other DHS Direct]
	5	2003.5	2004 Standard Demographic and Health Survey [DHS Direct]
	5	2009	2009 Standard Demographic and Health Survey [DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Liberia	4	2013	2014 Standard Demographic and Health Survey [DHS Direct]
	31	2014.5	
	2	1971.5	1970–1971 Population Growth Survey [Others Direct]
	1	1970.5	1970 Population Growth Survey [Others Direct]
	1	1971.5	1971 Population Growth Survey [Others Direct]
	5	1985.5	1986 Standard Demographic and Health Survey [DHS Direct]
	6	2006	2007 Standard Demographic and Health Survey [DHS Direct]
	1	2008.5	2008 Census [Census Direct]
	4	2008	2009 DHS Malaria Indicator Survey [Other DHS Direct]
	2	2009	2011 DHS Malaria Indicator Survey [Other DHS Direct]
Libya	7	2012.5	2013 Standard Demographic and Health Survey [DHS Direct]
	2	2014.5	2016 DHS Malaria Indicator Survey [Other DHS Direct]
Lithuania	38	2009.5	
	10	1994.5	1995 Pan Arab Project for Child Development [Other DHS Direct]
	28	2009.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Luxembourg	57	2015.5	
	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	53	2011.5	Vital Registration (Human Mortality Database) [VR]
Luxembourg	66	2015.5	
	6	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	60	2009.5	Vital Registration (Human Mortality Database) [VR]
Macao, SAR of China	43	2015.5	
	43	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Macedonia	26	2016.5	
	26	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Madagascar	43	2015.5	
	8	1992	1992 Standard Demographic and Health Survey [DHS Direct]
	1	1993.5	1993 Census [Census Direct]
	8	1997	1997 Standard Demographic and Health Survey [DHS Direct]
	5	2002.5	2003–2004 Standard Demographic and Health Survey [DHS Direct]
	12	2009	2008–2009 Standard Demographic and Health Survey [DHS Direct]
	3	2010.5	2011 DHS Malaria Indicator Survey [Other DHS Direct]
	3	2012.5	2013 DHS Malaria Indicator Survey [Other DHS Direct]
	3	2015.5	2016 DHS Malaria Indicator Survey [Other DHS Direct]
Malawi	100	2016	
	2	1971.5	1970–1972 Population Change Survey [Others Direct]
	1	1977.5	1977 Census [Census Direct]
	2	1982.5	1982 Malawi Demographic Survey [Others Direct]
	6	1991.5	1992 Standard Demographic and Health Survey [DHS Direct]
	12	2000	2000 Standard Demographic and Health Survey [DHS Direct]
	11	2005	2004 Standard Demographic and Health Survey [DHS Direct]
	14	2006	2006 Multiple Indicator Cluster Survey [Other DHS Direct]
	16	2010	2010 Standard Demographic and Health Survey [DHS Direct]
	2	2010.5	2012 DHS Malaria Indicator Survey [Other DHS Direct]
	15	2014	2013–2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	1	2011.5	2014 DHS Malaria Indicator Survey [Other DHS Direct]
	17	2016	2015–2016 Standard Demographic and Health Survey [DHS Direct]
	1	2015	2017 DHS Malaria Indicator Survey [Other DHS Direct]
Malaysia	64	2015.5	
	10	1974.5	1974 World Fertility Survey [Other DHS Direct]
	54	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Maldives	44	2014.5	
	5	2008	2009 Standard Demographic and Health Survey [DHS Direct]
	39	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Mali	77	2015.5	
	1	1957	1957–1958 Enquête démographique dans le Delta Central Nigérien [Others Direct]
	1	1960.5	1960–1961 Enquête démographique au Mali [Others Direct]
	1	1976	1976 Census [Census Direct]
	1	1987	1987 Census [Census Direct]
	5	1986	1987 Standard Demographic and Health Survey [DHS Direct]
	15	1996	1995–1996 Standard Demographic and Health Survey [DHS Direct]
	11	2001	2001 Standard Demographic and Health Survey [DHS Direct]
	10	2006	2006 Standard Demographic and Health Survey [DHS Direct]
	2	2009.5	2009 Census [Census Direct]
	1	2008	2010 Special Demographic and Health Survey [Other DHS Direct]
	11	2013	2012–2013 Standard Demographic and Health Survey [DHS Direct]
	15	2015.5	2015 Multiple Indicator Cluster Survey [Other DHS Direct]
	3	2015	2015 DHS Malaria Indicator Survey [Other DHS Direct]
Malta	51	2015.5	
	51	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Marshall Islands	1	2001.5	
	1	2001.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Martinique	36	2007.5	
	36	2007.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Mauritania	46	2015	
	1	1976.6	1977 Census [Census Direct]
	5	1980.5	1981 World Fertility Survey [Other DHS Direct]
	1	1987.8	1988 Census [Census Direct]
	9	1990	1990–1991 Pan Arab Project for Child Development [Other DHS Direct]
	6	2000	2000–2001 Standard Demographic and Health Survey [DHS Direct]
	5	2002.5	2003–2004 Special Demographic and Health Survey [Other DHS Direct]
	10	2011	2011 Multiple Indicator Cluster Survey [Other DHS Direct]
	9	2015	2015 Multiple Indicator Cluster Survey [Other DHS Direct]
Mauritius	44	2016.5	
	44	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Mayotte	0	–	–
Mexico	15	1985.5	
	10	1976.5	1976–1977 World Fertility Survey [Other DHS Direct]
	5	1985.5	1987 Standard Demographic and Health Survey [DHS Direct]
Micronesia Republic of	0	–	–
Moldova	37	2014.5	
	4	1995.5	1997 Reproductive Health Survey [Other DHS Direct]
	4	2002.5	2005 Standard Demographic and Health Survey [DHS Direct]
	3	2009	2012 Multiple Indicator Cluster Survey [Other DHS Direct]
	26	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Monaco	16	2016	
	16	2016	Vital Registration (United Nations Demographic Yearbook) [VR]
Mongolia	70	2016.5	
	9	1998	1998 Reproductive Health Survey [Other DHS Direct]
	3	2003	2003 Reproductive Health Survey [Other DHS Direct]
	3	2008	2008 Reproductive Health Survey [Other DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Montenegro	9	2013	2013 Multiple Indicator Cluster Survey [Other DHS Direct]
	46	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	21	2016.5	
Morocco	21	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Morocco	69	2004.5	
	8	1979.5	1980 World Fertility Survey [Other DHS Direct]
	9	1987	1987 Standard Demographic and Health Survey [DHS Direct]
	9	1991.5	1992 Standard Demographic and Health Survey [DHS Direct]
	4	1993	1995 Special Demographic and Health Survey [Other DHS Direct]
	8	1996.5	1996–1997 Pan Arab Project for Child Development [Other DHS Direct]
	11	2003.5	2003–2004 Pan Arab Project for Family Health [Other DHS Direct]
	11	2003.5	2003–2004 Standard Demographic and Health Survey [DHS Direct]
	9	2004.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Mozambique	35	2014.5	
Myanmar	4	1996	1997 Standard Demographic and Health Survey [DHS Direct]
	9	2003.5	2003 Standard Demographic and Health Survey [DHS Direct]
	9	2008	2008 Multiple Indicator Cluster Survey [Other DHS Direct]
	10	2011	2011 Standard Demographic and Health Survey [DHS Direct]
	3	2014.5	2015 Standard DHS AIDS Indicator Survey [Other DHS Direct]
Myanmar	6	2015	
Namibia	6	2015	2015–2016 Standard Demographic and Health Survey [DHS Direct]
	25	2012.5	
Namibia	6	1991.5	1992 Standard Demographic and Health Survey [DHS Direct]
	5	1999	2000 Standard Demographic and Health Survey [DHS Direct]
	1	2001.5	2001 Census [Census Direct]
	6	2006.5	2006–2007 Standard Demographic and Health Survey [DHS Direct]
	1	2011.5	2011 Census [Census Direct]
	6	2012.5	2013 Standard Demographic and Health Survey [DHS Direct]
Nauru	5	2011.5	
Nepal	5	2011.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	57	2015.5	
Nepal	8	1975.5	1976 World Fertility Survey [Other DHS Direct]
	10	1996	1996 Standard Demographic and Health Survey [DHS Direct]
	1	2001.5	2001 Census [Census Direct]
	10	2001	2001 Standard Demographic and Health Survey [DHS Direct]
	6	2004.5	2006 Standard Demographic and Health Survey [DHS Direct]
	1	2011.5	2011 Census [Census Direct]
	8	2010.5	2011 Standard Demographic and Health Survey [DHS Direct]
	4	2015.5	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	9	2015.5	2016 Standard Demographic and Health Survey [DHS Direct]
Netherlands	167	2016.5	
New Caledonia	6	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	161	2016.5	Vital Registration (Human Mortality Database) [VR]
New Caledonia	38	2015.5	
New Zealand	38	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	62	2016.5	
Nicaragua	1	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	61	2008.5	Vital Registration (Human Mortality Database) [VR]
	35	2006.5	
Nicaragua	7	1992	1992–1993 Reproductive Health Survey [Other DHS Direct]
	10	1997.5	1998 Standard Demographic and Health Survey [DHS Direct]
	9	2001	2001 Standard Demographic and Health Survey [DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Niger	9	2006.5	2006–2007 Reproductive Health Survey [Other DHS Direct]
	45	2012	
	1	1960	1960 Survey [Others Direct]
	8	1991.5	1992 Standard Demographic and Health Survey [DHS Direct]
	10	1998	1998 Standard Demographic and Health Survey [DHS Direct]
	1	2000.9	2001 Census [Census Direct]
	10	2006	2006 Standard Demographic and Health Survey [DHS Direct]
	1	2010.5	2010 Enquête sur la Survie et la Mortalité des Enfants [Others Direct]
	14	2012	2012 Standard Demographic and Health Survey [DHS Direct]
Nigeria	98	2017	
Niue	5	1981.5	1981–1982 World Fertility Survey [Other DHS Direct]
	8	1989.5	1990 Standard Demographic and Health Survey [DHS Direct]
	9	1999	1999 Standard Demographic and Health Survey [DHS Direct]
	6	2002.5	2003 Standard Demographic and Health Survey [DHS Direct]
	21	2008.5	2008 Standard Demographic and Health Survey [DHS Direct]
	8	2009.5	2010 DHS Malaria Indicator Survey [Other DHS Direct]
	20	2013	2013 Standard Demographic and Health Survey [DHS Direct]
	3	2015	2015 DHS Malaria Indicator Survey [Other DHS Direct]
	18	2017	2016–2017 Multiple Indicator Cluster Survey [Other DHS Direct]
Niue	5	2010.5	
Norway	170	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Oman	6	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	164	2009.5	Vital Registration (Human Mortality Database) [VR]
Oman	12	2016.5	
Pakistan	61	2012.5	
Palau	8	1974.5	1975 World Fertility Survey [Other DHS Direct]
	7	1990.5	1990–1991 Standard Demographic and Health Survey [DHS Direct]
	10	2006.5	2006–2007 Standard Demographic and Health Survey [DHS Direct]
	11	2012.5	2012–2013 Standard Demographic and Health Survey [DHS Direct]
	25	2007.5	Sampling Registration System [VR]
Palau	4	2003	
Panama	4	2003	Vital Registration (United Nations Demographic Yearbook) [VR]
	65	2015.5	
	6	1975	1975–1976 World Fertility Survey [Other DHS Direct]
Papua New Guinea	59	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Paraguay	0	–	–
Peru	39	2015	
	5	1978	1979 World Fertility Survey [Other DHS Direct]
	6	1989.5	1990 Standard Demographic and Health Survey [DHS Direct]
	11	1999	1995–1996 Reproductive Health Survey [Other DHS Direct]
	5	1997.5	1998 Reproductive Health Survey [Other DHS Direct]
	5	2003	2004 Reproductive Health Survey [Other DHS Direct]
	4	2007	2008 Reproductive Health Survey [Other DHS Direct]
Peru	3	2015	2016 Multiple Indicator Cluster Survey [Other DHS Direct]
	119	2012	
	9	1977.5	1977–1978 World Fertility Survey [Other DHS Direct]
	6	1985.5	1986 Standard Demographic and Health Survey [DHS Direct]
	12	1992	1991–1992 Standard Demographic and Health Survey [DHS Direct]
Peru	16	1996	1996 Standard Demographic and Health Survey [DHS Direct]
	15	2000	2000 Standard Demographic and Health Survey [DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Philippines	20	2007.5	2004–2008 Continuous Demographic and Health Survey [Other DHS Direct]
	10	2009	2009 Continuous Demographic and Health Survey [Other DHS Direct]
	10	2010	2010 Continuous Demographic and Health Survey [Other DHS Direct]
	10	2010.5	2011 Continuous Demographic and Health Survey [Other DHS Direct]
	11	2012	2012 Continuous Demographic and Health Survey [Other DHS Direct]
	83	2016.5	
	13	1977	1978 World Fertility Survey [Other DHS Direct]
	14	1993	1993 Standard Demographic and Health Survey [DHS Direct]
	10	1998	1998 Standard Demographic and Health Survey [DHS Direct]
	10	2003	2003 Standard Demographic and Health Survey [DHS Direct]
Poland	10	2008	2008 Standard Demographic and Health Survey [DHS Direct]
	10	2013	2013 Standard Demographic and Health Survey [DHS Direct]
	8	2016.5	2017 Standard Demographic and Health Survey [DHS Direct]
	8	1984.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	66	2015.5	
	14	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	52	2009.5	Vital Registration (Human Mortality Database) [VR]
	135	2015.5	
Portugal	5	1978.5	1979–1980 World Fertility Survey [Other DHS Direct]
	3	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	127	2012.5	Vital Registration (Human Mortality Database) [VR]
Puerto Rico	69	2014.5	
	5	1994.5	1995–1996 Reproductive Health Survey [Other DHS Direct]
	64	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Qatar	35	2015.5	
	35	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Reunion	38	2007.5	
	38	2007.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Romania	52	2015.5	
	52	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Russian Federation	56	2014.5	
	2	2012.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	54	2014.5	Vital Registration (Human Mortality Database) [VR]
Rwanda	55	2016.5	
	8	1983.5	1983 World Fertility Survey [Other DHS Direct]
	8	1991.5	1992 Standard Demographic and Health Survey [DHS Direct]
	6	1992	2000 Standard Demographic and Health Survey [DHS Direct]
	7	2005	2005 Standard Demographic and Health Survey [DHS Direct]
	5	2007.5	2007–2008 Interim Demographic and Health Survey [Other DHS Direct]
	9	2010.5	2010 Standard Demographic and Health Survey [DHS Direct]
	2	2012	2013 DHS Malaria Indicator Survey [Other DHS Direct]
	8	2015	2014–2015 Standard Demographic and Health Survey [DHS Direct]
	2	2016.5	2017 Standard Demographic and Health Survey [DHS Direct]
Saint Kitts and Nevis	16	2001	
	16	2001	Vital Registration (United Nations Demographic Yearbook) [VR]
Saint Lucia	37	2006.5	
	37	2006.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Samoa	18	2014.5	
	1	2011.5	2011 Census [Census Direct]
San Marino	17	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	11	2012	

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Sao Tome and Principe	11	2012	Vital Registration (United Nations Demographic Yearbook) [VR]
	9	2012	
	2	2005	2008–2009 Standard Demographic and Health Survey [DHS Direct]
	3	2012	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	4	1978.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Saudi Arabia	15	2009.5	
	15	2009.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Senegal	115	2017	
	6	1977.5	1978 World Fertility Survey [Other DHS Direct]
	6	1985.5	1986 Standard Demographic and Health Survey [DHS Direct]
	9	1992.5	1992–1993 Standard Demographic and Health Survey [DHS Direct]
	9	1996.5	1997 Standard Demographic and Health Survey [DHS Direct]
	17	2000	1999 Standard Demographic and Health Survey [DHS Direct]
	1	2002.5	2002 Census [Census Direct]
	10	2005	2005 Standard Demographic and Health Survey [DHS Direct]
	2	2005.5	2006 DHS Malaria Indicator Survey [Other DHS Direct]
	11	2008.5	2008–2009 DHS Malaria Indicator Survey [Other DHS Direct]
	10	2010.5	2010–2011 Standard Demographic and Health Survey [DHS Direct]
	5	2011.5	2012–2013 Continuous Demographic and Health Survey [Other DHS Direct]
	7	2013.5	2014 Continuous Demographic and Health Survey [Other DHS Direct]
	6	2014.5	2015 Continuous Demographic and Health Survey [Other DHS Direct]
	6	2015	2016 Continuous Demographic and Health Survey [Other DHS Direct]
	10	2017	2017 Continuous Demographic and Health Survey [Other DHS Direct]
Serbia	2	1997.5	
	2	1997.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Seychelles	34	2015	
	34	2015	Vital Registration (United Nations Demographic Yearbook) [VR]
Sierra Leone	36	2017	
	7	2008	2008 Standard Demographic and Health Survey [DHS Direct]
	14	2013	2013 Standard Demographic and Health Survey [DHS Direct]
	2	2015.5	2016 DHS Malaria Indicator Survey [Other DHS Direct]
	13	2017	2017 Multiple Indicator Cluster Survey [Other DHS Direct]
Singapore	56	2016.5	
	56	2016.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Slovakia	66	2015.5	
	6	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	60	2009.5	Vital Registration (Human Mortality Database) [VR]
Slovenia	62	2015.5	
	35	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	27	2009.5	Vital Registration (Human Mortality Database) [VR]
Solomon Islands	0	–	–
Somalia	8	2006	
	8	2006	2006 Multiple Indicator Cluster Survey [Other DHS Direct]
South Africa	7	1997.5	
	7	1997.5	1998 Standard Demographic and Health Survey [DHS Direct]
South Sudan	10	2010	
	10	2010	2010 Multiple Indicator Cluster Survey [Other DHS Direct]
Spain	108	2015.5	
	3	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	105	2012.5	Vital Registration (Human Mortality Database) [VR]
Sri Lanka	52	2015.5	

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Saint Vincent and the Grenadines	10	1975	1975 World Fertility Survey [Other DHS Direct]
	7	1986	1987 Standard Demographic and Health Survey [DHS Direct]
	35	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
State of Palestine	35	2014.5	
	52	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Sudan	20	2010	2010 Multiple Indicator Cluster Survey [Other DHS Direct]
	11	2014	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	21	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Sudan	49	2014	
Suriname	5	1978	1978–1979 World Fertility Survey [Other DHS Direct]
	11	1990	1989–1990 Standard Demographic and Health Survey [DHS Direct]
	10	1992.5	1992–1993 Pan Arab Project for Child Development [Other DHS Direct]
	11	2010	2010 Multiple Indicator Cluster Survey [Other DHS Direct]
	12	2014	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
Suriname	33	2015.5	
Swaziland	33	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	12	2013	
Sweden	4	2005.5	2006–2007 Standard Demographic and Health Survey [DHS Direct]
	1	2007.5	2007 Census [Census Direct]
	4	2009	2010 Multiple Indicator Cluster Survey [Other DHS Direct]
	3	2013	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
Sweden	264	2016.5	
Switzerland	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	260	2016.5	Vital Registration (Human Mortality Database) [VR]
Syria	146	2016.5	
	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Syria	142	2016.5	Vital Registration (Human Mortality Database) [VR]
	29	2001	
	9	1978	1978 World Fertility Survey [Other DHS Direct]
Taiwan, Province of China	9	1992.5	1993 Pan Arab Project for Child Development [Other DHS Direct]
	11	2001	2001 Pan Arab Project for Family Health [Other DHS Direct]
	107	2017.5	
Tajikistan	3	2017.5	Vital Registration (Demographic Fact Book) [VR]
	104	2014.5	Vital Registration (Human Mortality Database) [VR]
Tajikistan	20	2016.5	
Tanzania	7	2012	2012 Standard Demographic and Health Survey [DHS Direct]
	7	2016.5	2017 Standard Demographic and Health Survey [DHS Direct]
	6	1994.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Tanzania	61	2016.5	
Thailand	7	1991.5	1991–1992 Standard Demographic and Health Survey [DHS Direct]
	9	1996	1996 Standard Demographic and Health Survey [DHS Direct]
	3	1997.5	1999 Standard Demographic and Health Survey [DHS Direct]
	9	2004.5	2004–2005 Standard Demographic and Health Survey [DHS Direct]
	7	2007.5	2007–2008 Standard DHS AIDS Indicator Survey [Other DHS Direct]
	9	2010	2010 Standard Demographic and Health Survey [DHS Direct]
	4	2011.5	2011–2012 Standard DHS AIDS Indicator Survey [Other DHS Direct]
	10	2015.5	2015–2016 Standard Demographic and Health Survey [DHS Direct]
	3	2016.5	2017 DHS Malaria Indicator Survey [Other DHS Direct]
Thailand	12	1985.5	

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Timor-Leste	1	1960	1960 Census [Census Direct]
	6	1974.5	1975 World Fertility Survey [Other DHS Direct]
	5	1985.5	1987 Standard Demographic and Health Survey [DHS Direct]
	20	2016	
Togo	10	2009.5	2009–2010 Standard Demographic and Health Survey [DHS Direct]
	1	2015.5	2015 Census [Census Direct]
	9	2016	2016 Standard Demographic and Health Survey [DHS Direct]
	25	2016	
Tonga	5	1987.5	1988 Standard Demographic and Health Survey [DHS Direct]
	9	1998	1998 Standard Demographic and Health Survey [DHS Direct]
	9	2013.5	2013–2014 Standard Demographic and Health Survey [DHS Direct]
	2	2016	2017 DHS Malaria Indicator Survey [Other DHS Direct]
Trinidad and Tobago	25	2004.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	76	2015.5	
	5	1976	1977 World Fertility Survey [Other DHS Direct]
	3	1985	1987 Standard Demographic and Health Survey [DHS Direct]
Tunisia	68	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	75	2015.5	
	8	1977.5	1978 World Fertility Survey [Other DHS Direct]
	7	1988	1988 Standard Demographic and Health Survey [DHS Direct]
	6	1994	1994–1995 Pan Arab Project for Child Development [Other DHS Direct]
	6	1999.5	2001 Pan Arab Project for Family Health [Other DHS Direct]
	4	2010.5	2011–2012 Multiple Indicator Cluster Survey [Other DHS Direct]
Turkey	44	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	49	2015.5	
	7	1977	1978 World Fertility Survey [Other DHS Direct]
	8	1992.5	1993 Standard Demographic and Health Survey [DHS Direct]
	7	1997.5	1998 Standard Demographic and Health Survey [DHS Direct]
	7	2003	2003 Standard Demographic and Health Survey [DHS Direct]
Turkmenistan	20	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	5	2014.5	
Tuvalu	5	2014.5	2015–2016 Multiple Indicator Cluster Survey [Other DHS Direct]
	3	2005.5	
United Kingdom	3	2005.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	95	2016.5	
	4	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	91	2016.5	Vital Registration (Human Mortality Database) [VR]
United States of America	84	2016.5	
	5	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	79	2016.5	Vital Registration (Human Mortality Database) [VR]
	63	2016.5	
Uganda	6	1988	1988–1989 Standard Demographic and Health Survey [DHS Direct]
	7	1994.5	1995 Standard Demographic and Health Survey [DHS Direct]
	8	2000.5	2000–2001 Standard Demographic and Health Survey [DHS Direct]
	10	2006	2006 Standard Demographic and Health Survey [DHS Direct]
	3	2008	2009 DHS Malaria Indicator Survey [Other DHS Direct]
	9	2011	2011 Standard Demographic and Health Survey [DHS Direct]
	3	2014	2014–2015 DHS Malaria Indicator Survey [Other DHS Direct]
	17	2016.5	2016 Standard Demographic and Health Survey [DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Ukraine	75	2014.5	
	3	1996.5	1999 Reproductive Health Survey [Other DHS Direct]
	3	2003.5	2007 Standard Demographic and Health Survey [DHS Direct]
	3	2011	2012 Multiple Indicator Cluster Survey [Other DHS Direct]
	2	2014.5	Vital Registration (United Nations Demographic Yearbook) [VR]
	64	2009.5	Vital Registration (Human Mortality Database) [VR]
Uruguay	51	2015.5	
	51	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
United States Virgin Islands	31	1993.5	
	31	1993.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Uzbekistan	29	2015.5	
	4	1994.5	1996 Standard Demographic and Health Survey [DHS Direct]
	4	2000.5	2002 Special Demographic and Health Survey [Other DHS Direct]
	21	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Vanuatu	0	–	–
Venezuela (Bolivarian Republic of)	71	2015.5	
	5	1976	1977 World Fertility Survey [Other DHS Direct]
	66	2015.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Vietnam	44	2015.8	
	6	1996	1997 Standard Demographic and Health Survey [DHS Direct]
	1	2000	2000 Annual Population Change and Family Planning Survey [Others Direct]
	1	2000.8	2001 Annual Population Change and Family Planning Survey [Others Direct]
	1	2001.8	2002 Annual Population Change and Family Planning Survey [Others Direct]
	6	2000.5	2002 Standard Demographic and Health Survey [DHS Direct]
	1	2002.8	2003 Annual Population Change and Family Planning Survey [Others Direct]
	1	2003.8	2004 Annual Population Change and Family Planning Survey [Others Direct]
	1	2004.8	2005 Annual Population Change and Family Planning Survey [Others Direct]
	1	2005.8	2006 Annual Population Change and Family Planning Survey [Others Direct]
	1	2006.8	2007 Annual Population Change and Family Planning Survey [Others Direct]
	1	2007.8	2008 Annual Population Change and Family Planning Survey [Others Direct]
	1	2008.8	2009 Annual Population Change and Family Planning Survey [Others Direct]
	1	2008.7	2009 Census [Census Direct]
	1	2009.8	2010 Annual Population Change and Family Planning Survey [Others Direct]
	1	2010.8	2011 Annual Population Change and Family Planning Survey [Others Direct]
	1	2011.8	2012 Annual Population Change and Family Planning Survey [Others Direct]
	1	2012.8	2013 Annual Population Change and Family Planning Survey [Others Direct]
	5	2012.5	2013–2014 Multiple Indicator Cluster Survey [Other DHS Direct]
	1	2013.8	2014 Annual Population Change and Family Planning Survey [Others Direct]
	1	2014.8	2015 Annual Population Change and Family Planning Survey [Others Direct]
	1	2015.8	2016 Annual Population Change and Family Planning Survey [Others Direct]
	9	2007.5	Vital Registration (United Nations Demographic Yearbook) [VR]
Western Sahara	0	–	–
Yemen	65	2013.5	
	4	1978.5	1979 World Fertility Survey [Other DHS Direct]
	10	1991.5	1991–1992 Pan Arab Project for Child Development [Other DHS Direct]
	9	1991.5	1991–1992 Standard Demographic and Health Survey [DHS Direct]
	19	2003	2003 Pan Arab Project for Family Health [Other DHS Direct]
	6	2005.5	2006 Multiple Indicator Cluster Survey [Other DHS Direct]
	17	2013.5	2013 Standard Demographic and Health Survey [DHS Direct]

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Country	#Obs.	Most Recent Ref. Year	Data Series Name [Source Type]
Zambia	52	2014	
		9	1992 Standard Demographic and Health Survey [DHS Direct]
		9	1996 Standard Demographic and Health Survey [DHS Direct]
		9	2001.5 Standard Demographic and Health Survey [DHS Direct]
		8	2007 Standard Demographic and Health Survey [DHS Direct]
		1	2010 Census [Census Direct]
Zimbabwe	52	2014.5	2013–2014 Standard Demographic and Health Survey [DHS Direct]
		5	1988 Standard Demographic and Health Survey [DHS Direct]
		7	1993.5 Standard Demographic and Health Survey [DHS Direct]
		5	1998 Standard Demographic and Health Survey [DHS Direct]
		5	2004.5 Standard Demographic and Health Survey [DHS Direct]
		7	2008.5 Multiple Indicator Cluster Survey [Other DHS Direct]
		6	2010–2011 Standard Demographic and Health Survey [DHS Direct]
		10	2014 Multiple Indicator Cluster Survey [Other DHS Direct]
		7	2014.5 Standard Demographic and Health Survey [DHS Direct]

Table 20: **SRB estimates and uncertainty intervals, by country.** Estimates and 90% uncertainty intervals for sex ratio at birth in 1990, 2000, 2010, and 2017. Numbers in brackets are 95% uncertainty intervals. Countries are ordered alphabetically.

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
Afghanistan	1.052 [1.040; 1.063]	1.052 [1.030; 1.075]	1.059 [1.032; 1.088]	1.068 [1.040; 1.095]	1.064 [1.037; 1.092]	1.059 [1.031; 1.095]
Albania	1.058 [1.055; 1.061]	1.058 [1.038; 1.078]	1.082 [1.061; 1.104]	1.103 [1.081; 1.124]	1.113 [1.091; 1.136]	1.083 [1.054; 1.113]
Algeria	1.050 [1.036; 1.064]	1.047 [1.037; 1.056]	1.042 [1.029; 1.056]	1.047 [1.039; 1.056]	1.048 [1.040; 1.057]	1.044 [1.032; 1.056]
Andorra	1.058 [1.055; 1.061]	1.058 [1.042; 1.074]	1.057 [1.036; 1.080]	1.058 [1.037; 1.080]	1.055 [1.034; 1.077]	1.055 [1.033; 1.078]
Angola	1.031 [1.027; 1.036]	1.030 [1.014; 1.045]	1.031 [1.010; 1.053]	1.031 [1.011; 1.051]	1.027 [1.008; 1.047]	1.027 [1.007; 1.048]
Antigua and Barbuda	1.041 [1.037; 1.045]	1.032 [1.016; 1.048]	1.028 [1.007; 1.049]	1.029 [1.008; 1.051]	1.031 [1.009; 1.054]	1.031 [1.009; 1.054]
Arab Emirates	1.050 [1.044; 1.056]	1.043 [1.034; 1.053]	1.044 [1.032; 1.056]	1.046 [1.038; 1.054]	1.045 [1.038; 1.053]	1.050 [1.038; 1.062]
Argentina	1.041 [1.037; 1.045]	1.049 [1.041; 1.057]	1.054 [1.045; 1.063]	1.055 [1.046; 1.063]	1.062 [1.053; 1.071]	1.057 [1.044; 1.070]
Armenia	1.062 [1.050; 1.075]	1.062 [1.040; 1.086]	1.059 [1.034; 1.085]	1.176 [1.150; 1.203]	1.145 [1.120; 1.171]	1.117 [1.087; 1.149]
Aruba	1.041 [1.037; 1.045]	1.043 [1.028; 1.058]	1.042 [1.023; 1.062]	1.043 [1.024; 1.062]	1.044 [1.025; 1.063]	1.045 [1.025; 1.065]
Australia	1.058 [1.055; 1.061]	1.055 [1.049; 1.062]	1.056 [1.051; 1.062]	1.053 [1.048; 1.059]	1.058 [1.050; 1.066]	1.057 [1.046; 1.068]
Austria	1.058 [1.055; 1.061]	1.057 [1.052; 1.063]	1.056 [1.049; 1.063]	1.051 [1.043; 1.058]	1.058 [1.050; 1.065]	1.064 [1.052; 1.076]
Azerbaijan	1.062 [1.050; 1.075]	1.062 [1.040; 1.086]	1.066 [1.038; 1.094]	1.155 [1.129; 1.181]	1.166 [1.141; 1.191]	1.134 [1.097; 1.168]
Bahamas	1.041 [1.037; 1.045]	1.029 [1.019; 1.039]	1.028 [1.014; 1.041]	1.019 [1.005; 1.032]	1.025 [1.010; 1.039]	1.029 [1.012; 1.046]
Bahrain	1.050 [1.044; 1.056]	1.036 [1.027; 1.046]	1.040 [1.029; 1.051]	1.039 [1.028; 1.050]	1.038 [1.028; 1.049]	1.041 [1.026; 1.057]
Bangladesh	1.052 [1.040; 1.063]	1.050 [1.029; 1.070]	1.051 [1.029; 1.073]	1.044 [1.020; 1.068]	1.036 [1.014; 1.059]	1.055 [1.023; 1.151]
Barbados	1.041 [1.037; 1.045]	1.035 [1.025; 1.045]	1.036 [1.021; 1.051]	1.039 [1.024; 1.054]	1.038 [1.020; 1.056]	1.037 [1.018; 1.056]
Belarus	1.058 [1.055; 1.061]	1.060 [1.052; 1.068]	1.064 [1.058; 1.070]	1.064 [1.057; 1.071]	1.063 [1.056; 1.070]	1.063 [1.053; 1.073]
Belgium	1.058 [1.055; 1.061]	1.053 [1.047; 1.058]	1.052 [1.046; 1.059]	1.047 [1.040; 1.053]	1.048 [1.042; 1.055]	1.050 [1.039; 1.062]
Belize	1.041 [1.037; 1.045]	1.050 [1.032; 1.068]	1.052 [1.030; 1.076]	1.051 [1.027; 1.074]	1.051 [1.027; 1.075]	1.050 [1.027; 1.075]
Benin	1.031 [1.027; 1.036]	1.043 [1.030; 1.055]	1.050 [1.035; 1.066]	1.049 [1.035; 1.063]	1.044 [1.028; 1.060]	1.042 [1.024; 1.061]
Bhutan	1.052 [1.040; 1.063]	1.051 [1.030; 1.072]	1.051 [1.025; 1.078]	1.051 [1.025; 1.077]	1.051 [1.024; 1.078]	1.051 [1.024; 1.078]
Bolivia (Plurinational State of)	1.041 [1.037; 1.045]	1.043 [1.030; 1.056]	1.041 [1.026; 1.056]	1.041 [1.025; 1.058]	1.042 [1.023; 1.062]	1.042 [1.023; 1.063]
Bosnia and Herzegovina	1.058 [1.055; 1.061]	1.064 [1.054; 1.075]	1.063 [1.053; 1.074]	1.065 [1.056; 1.074]	1.069 [1.059; 1.078]	1.067 [1.052; 1.082]
Botswana	1.031 [1.027; 1.036]	1.031 [1.012; 1.051]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]
Brazil	1.041 [1.037; 1.045]	1.044 [1.029; 1.059]	1.047 [1.027; 1.066]	1.045 [1.023; 1.067]	1.044 [1.022; 1.067]	1.044 [1.022; 1.067]
Brunei	1.063 [1.055; 1.072]	1.067 [1.057; 1.077]	1.069 [1.056; 1.083]	1.068 [1.055; 1.082]	1.070 [1.057; 1.084]	1.072 [1.055; 1.088]

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Table 20 – continued from previous page

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
Bulgaria	1.058 [1.055; 1.061]	1.060 [1.053; 1.068]	1.058 [1.051; 1.065]	1.060 [1.052; 1.067]	1.058 [1.050; 1.065]	1.061 [1.048; 1.074]
Burkina Faso	1.031 [1.027; 1.036]	1.039 [1.027; 1.052]	1.043 [1.027; 1.059]	1.044 [1.028; 1.060]	1.041 [1.024; 1.059]	1.041 [1.021; 1.060]
Burundi	1.031 [1.027; 1.036]	1.025 [1.011; 1.039]	1.024 [1.004; 1.043]	1.023 [1.005; 1.040]	1.022 [1.005; 1.038]	1.023 [1.005; 1.042]
Cambodia	1.063 [1.055; 1.072]	1.054 [1.040; 1.067]	1.048 [1.032; 1.065]	1.049 [1.033; 1.065]	1.050 [1.033; 1.069]	1.052 [1.032; 1.072]
Cameroon	1.031 [1.027; 1.036]	1.027 [1.015; 1.040]	1.023 [1.007; 1.040]	1.026 [1.010; 1.042]	1.024 [1.007; 1.041]	1.026 [1.007; 1.046]
Canada	1.058 [1.055; 1.061]	1.057 [1.050; 1.064]	1.054 [1.049; 1.059]	1.054 [1.049; 1.059]	1.053 [1.048; 1.058]	1.056 [1.043; 1.070]
Cape Verde	1.031 [1.027; 1.036]	1.033 [1.021; 1.044]	1.032 [1.017; 1.047]	1.033 [1.017; 1.050]	1.033 [1.013; 1.053]	1.033 [1.013; 1.053]
Central African Republic	1.031 [1.027; 1.036]	1.031 [1.014; 1.048]	1.032 [1.010; 1.054]	1.031 [1.008; 1.054]	1.031 [1.007; 1.055]	1.031 [1.007; 1.055]
Chad	1.031 [1.027; 1.036]	1.036 [1.022; 1.050]	1.035 [1.018; 1.053]	1.037 [1.020; 1.054]	1.041 [1.023; 1.058]	1.039 [1.020; 1.059]
Channel Islands	1.058 [1.055; 1.061]	1.055 [1.041; 1.069]	1.057 [1.039; 1.077]	1.056 [1.035; 1.077]	1.056 [1.034; 1.078]	1.056 [1.034; 1.077]
Chile	1.041 [1.037; 1.045]	1.045 [1.038; 1.051]	1.052 [1.047; 1.057]	1.045 [1.039; 1.050]	1.041 [1.036; 1.047]	1.043 [1.031; 1.056]
China	1.063 [1.054; 1.072]	1.063 [1.044; 1.082]	1.119 [1.080; 1.154]	1.171 [1.137; 1.209]	1.174 [1.131; 1.219]	1.143 [1.079; 1.205]
Colombia	1.041 [1.037; 1.045]	1.045 [1.033; 1.057]	1.044 [1.029; 1.059]	1.046 [1.032; 1.061]	1.046 [1.029; 1.063]	1.045 [1.026; 1.064]
Comoros	1.031 [1.027; 1.036]	1.031 [1.014; 1.049]	1.032 [1.009; 1.054]	1.035 [1.013; 1.058]	1.032 [1.009; 1.055]	1.032 [1.008; 1.055]
Cook Islands	1.067 [1.058; 1.077]	1.060 [1.043; 1.078]	1.060 [1.036; 1.083]	1.060 [1.036; 1.085]	1.061 [1.037; 1.085]	1.060 [1.036; 1.085]
Costa Rica	1.041 [1.037; 1.045]	1.047 [1.038; 1.056]	1.056 [1.047; 1.065]	1.051 [1.042; 1.060]	1.047 [1.038; 1.056]	1.043 [1.031; 1.055]
Cote d'Ivoire	1.031 [1.027; 1.036]	1.030 [1.017; 1.044]	1.030 [1.012; 1.048]	1.030 [1.012; 1.049]	1.031 [1.013; 1.050]	1.030 [1.010; 1.050]
Croatia	1.058 [1.055; 1.061]	1.060 [1.050; 1.070]	1.063 [1.054; 1.071]	1.059 [1.050; 1.067]	1.063 [1.054; 1.071]	1.058 [1.046; 1.070]
Cuba	1.041 [1.037; 1.045]	1.065 [1.056; 1.073]	1.086 [1.077; 1.095]	1.080 [1.071; 1.089]	1.067 [1.058; 1.076]	1.073 [1.061; 1.086]
Curacao	1.041 [1.037; 1.045]	1.045 [1.029; 1.061]	1.045 [1.023; 1.068]	1.047 [1.026; 1.067]	1.048 [1.029; 1.067]	1.045 [1.025; 1.066]
Cyprus	1.050 [1.044; 1.056]	1.064 [1.054; 1.075]	1.072 [1.057; 1.087]	1.067 [1.048; 1.086]	1.065 [1.046; 1.085]	1.065 [1.045; 1.085]
Czech Republic	1.058 [1.055; 1.061]	1.058 [1.051; 1.066]	1.055 [1.048; 1.061]	1.061 [1.053; 1.068]	1.052 [1.046; 1.059]	1.055 [1.045; 1.065]
Democratic People's Republic of Korea	1.063 [1.054; 1.072]	1.062 [1.041; 1.084]	1.063 [1.036; 1.090]	1.063 [1.036; 1.090]	1.062 [1.036; 1.090]	1.062 [1.035; 1.090]
Democratic Republic of the Congo	1.031 [1.027; 1.036]	1.026 [1.011; 1.041]	1.027 [1.007; 1.048]	1.025 [1.007; 1.044]	1.019 [1.001; 1.037]	1.022 [1.002; 1.043]
Denmark	1.058 [1.055; 1.061]	1.054 [1.048; 1.059]	1.057 [1.049; 1.064]	1.053 [1.046; 1.061]	1.052 [1.044; 1.059]	1.057 [1.046; 1.068]
Djibouti	1.031 [1.027; 1.036]	1.037 [1.020; 1.055]	1.040 [1.017; 1.064]	1.039 [1.016; 1.063]	1.038 [1.015; 1.063]	1.038 [1.014; 1.062]
Dominica	1.041 [1.037; 1.045]	1.031 [1.014; 1.048]	1.027 [1.006; 1.049]	1.028 [1.007; 1.048]	1.029 [1.007; 1.052]	1.030 [1.008; 1.053]
Dominican Republic	1.041 [1.037; 1.045]	1.043 [1.031; 1.056]	1.043 [1.027; 1.059]	1.049 [1.033; 1.065]	1.048 [1.031; 1.066]	1.045 [1.026; 1.065]
Ecuador	1.041 [1.037; 1.045]	1.046 [1.032; 1.060]	1.048 [1.031; 1.067]	1.049 [1.030; 1.069]	1.047 [1.026; 1.069]	1.046 [1.025; 1.068]

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Table 20 – continued from previous page

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
Egypt	1.050 [1.036; 1.064]	1.056 [1.036; 1.077]	1.067 [1.045; 1.090]	1.059 [1.037; 1.082]	1.055 [1.033; 1.078]	1.054 [1.029; 1.086]
El Salvador	1.041 [1.037; 1.045]	1.050 [1.040; 1.058]	1.039 [1.030; 1.047]	1.063 [1.054; 1.071]	1.081 [1.072; 1.090]	1.064 [1.051; 1.078]
Equatorial Guinea	1.031 [1.027; 1.036]	1.031 [1.013; 1.050]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]
Eritrea	1.031 [1.027; 1.036]	1.031 [1.012; 1.050]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]
Estonia	1.058 [1.055; 1.061]	1.059 [1.050; 1.068]	1.059 [1.049; 1.069]	1.062 [1.051; 1.074]	1.057 [1.046; 1.069]	1.057 [1.042; 1.072]
Ethiopia	1.031 [1.027; 1.036]	1.053 [1.039; 1.067]	1.061 [1.043; 1.079]	1.056 [1.040; 1.074]	1.059 [1.041; 1.078]	1.055 [1.035; 1.076]
Fiji	1.067 [1.058; 1.077]	1.068 [1.058; 1.077]	1.071 [1.057; 1.085]	1.070 [1.059; 1.081]	1.070 [1.055; 1.085]	1.069 [1.051; 1.087]
Finland	1.058 [1.055; 1.061]	1.053 [1.047; 1.058]	1.045 [1.037; 1.053]	1.049 [1.041; 1.057]	1.047 [1.039; 1.055]	1.051 [1.038; 1.063]
France	1.058 [1.055; 1.061]	1.052 [1.048; 1.057]	1.053 [1.049; 1.057]	1.052 [1.048; 1.056]	1.046 [1.043; 1.050]	1.049 [1.039; 1.059]
French Guiana	1.041 [1.037; 1.045]	1.034 [1.022; 1.045]	1.033 [1.017; 1.049]	1.033 [1.018; 1.047]	1.036 [1.019; 1.054]	1.035 [1.016; 1.054]
French Polynesia	1.067 [1.058; 1.077]	1.055 [1.039; 1.071]	1.054 [1.031; 1.077]	1.055 [1.032; 1.078]	1.055 [1.032; 1.079]	1.055 [1.031; 1.078]
Gabon	1.031 [1.027; 1.036]	1.021 [1.005; 1.038]	1.017 [0.995; 1.038]	1.016 [0.995; 1.038]	1.019 [0.997; 1.041]	1.020 [0.998; 1.043]
Gambia	1.031 [1.027; 1.036]	1.031 [1.012; 1.051]	1.030 [1.006; 1.057]	1.031 [1.007; 1.056]	1.031 [1.006; 1.056]	1.031 [1.006; 1.056]
Georgia	1.062 [1.050; 1.075]	1.062 [1.039; 1.086]	1.062 [1.033; 1.096]	1.114 [1.089; 1.139]	1.081 [1.053; 1.108]	1.065 [1.039; 1.092]
Germany	1.058 [1.055; 1.061]	1.056 [1.049; 1.065]	1.056 [1.053; 1.060]	1.054 [1.051; 1.058]	1.051 [1.047; 1.055]	1.054 [1.044; 1.065]
Ghana	1.031 [1.027; 1.036]	1.040 [1.028; 1.052]	1.044 [1.027; 1.060]	1.041 [1.026; 1.057]	1.040 [1.024; 1.057]	1.040 [1.022; 1.058]
Greece	1.058 [1.055; 1.061]	1.064 [1.056; 1.071]	1.062 [1.054; 1.070]	1.065 [1.058; 1.072]	1.064 [1.057; 1.070]	1.062 [1.052; 1.073]
Grenada	1.041 [1.037; 1.045]	1.032 [1.019; 1.046]	1.028 [1.012; 1.045]	1.031 [1.013; 1.049]	1.032 [1.012; 1.052]	1.032 [1.011; 1.053]
Guadeloupe	1.041 [1.037; 1.045]	1.031 [1.021; 1.041]	1.032 [1.017; 1.047]	1.038 [1.024; 1.052]	1.033 [1.015; 1.051]	1.032 [1.013; 1.051]
Guam	1.067 [1.058; 1.077]	1.071 [1.060; 1.083]	1.072 [1.057; 1.088]	1.075 [1.059; 1.091]	1.073 [1.054; 1.092]	1.073 [1.054; 1.092]
Guatemala	1.041 [1.037; 1.045]	1.041 [1.034; 1.049]	1.040 [1.032; 1.049]	1.033 [1.022; 1.044]	1.034 [1.025; 1.043]	1.039 [1.023; 1.054]
Guinea	1.031 [1.027; 1.036]	1.040 [1.026; 1.054]	1.043 [1.024; 1.061]	1.046 [1.028; 1.063]	1.042 [1.023; 1.060]	1.041 [1.022; 1.061]
Guinea-Bissau	1.031 [1.027; 1.036]	1.035 [1.017; 1.052]	1.035 [1.012; 1.059]	1.037 [1.015; 1.061]	1.036 [1.014; 1.059]	1.036 [1.012; 1.059]
Guyana	1.041 [1.037; 1.045]	1.039 [1.028; 1.050]	1.037 [1.019; 1.055]	1.043 [1.025; 1.060]	1.045 [1.032; 1.059]	1.041 [1.024; 1.059]
Haiti	1.041 [1.037; 1.045]	1.032 [1.018; 1.045]	1.026 [1.008; 1.044]	1.027 [1.009; 1.044]	1.032 [1.013; 1.051]	1.031 [1.011; 1.051]
Honduras	1.041 [1.037; 1.045]	1.049 [1.036; 1.063]	1.051 [1.034; 1.068]	1.053 [1.036; 1.070]	1.055 [1.036; 1.074]	1.052 [1.032; 1.074]
Hong Kong, SAR of China	1.063 [1.054; 1.072]	1.081 [1.068; 1.093]	1.072 [1.057; 1.087]	1.086 [1.070; 1.101]	1.154 [1.138; 1.171]	1.078 [1.059; 1.098]
Hungary	1.058 [1.055; 1.061]	1.062 [1.054; 1.069]	1.051 [1.044; 1.057]	1.062 [1.055; 1.069]	1.057 [1.050; 1.064]	1.058 [1.046; 1.071]
Iceland	1.058 [1.055; 1.061]	1.053 [1.046; 1.061]	1.053 [1.040; 1.067]	1.048 [1.034; 1.063]	1.049 [1.035; 1.063]	1.048 [1.033; 1.065]

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Table 20 – continued from previous page

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
India	1.052 [1.040; 1.063]	1.053 [1.032; 1.075]	1.096 [1.073; 1.119]	1.113 [1.089; 1.137]	1.098 [1.075; 1.122]	1.098 [1.071; 1.124]
Indonesia	1.063 [1.055; 1.072]	1.061 [1.049; 1.073]	1.069 [1.055; 1.083]	1.063 [1.048; 1.079]	1.059 [1.042; 1.077]	1.060 [1.040; 1.080]
Iran (Islamic Republic of)	1.052 [1.040; 1.063]	1.049 [1.040; 1.058]	1.027 [1.017; 1.036]	1.043 [1.034; 1.052]	1.051 [1.042; 1.060]	1.052 [1.039; 1.066]
Iraq	1.050 [1.044; 1.056]	1.052 [1.037; 1.067]	1.052 [1.033; 1.071]	1.053 [1.036; 1.071]	1.054 [1.034; 1.073]	1.053 [1.032; 1.075]
Ireland	1.058 [1.055; 1.061]	1.056 [1.048; 1.064]	1.065 [1.056; 1.073]	1.059 [1.051; 1.067]	1.048 [1.040; 1.056]	1.050 [1.037; 1.063]
Israel	1.050 [1.044; 1.056]	1.057 [1.049; 1.064]	1.053 [1.046; 1.060]	1.057 [1.051; 1.064]	1.052 [1.046; 1.058]	1.058 [1.046; 1.069]
Italy	1.058 [1.055; 1.061]	1.059 [1.053; 1.064]	1.062 [1.058; 1.066]	1.062 [1.057; 1.066]	1.059 [1.051; 1.067]	1.059 [1.048; 1.070]
Jamaica	1.041 [1.037; 1.045]	1.037 [1.028; 1.047]	1.040 [1.024; 1.057]	1.037 [1.028; 1.047]	1.038 [1.023; 1.052]	1.037 [1.020; 1.055]
Japan	1.063 [1.054; 1.072]	1.050 [1.044; 1.056]	1.055 [1.052; 1.058]	1.057 [1.054; 1.061]	1.057 [1.053; 1.060]	1.054 [1.042; 1.066]
Jordan	1.050 [1.044; 1.056]	1.049 [1.030; 1.067]	1.054 [1.034; 1.075]	1.048 [1.028; 1.069]	1.048 [1.027; 1.068]	1.051 [1.028; 1.077]
Kazakhstan	1.062 [1.050; 1.075]	1.060 [1.050; 1.071]	1.058 [1.049; 1.067]	1.059 [1.050; 1.068]	1.061 [1.051; 1.070]	1.061 [1.045; 1.076]
Kenya	1.031 [1.027; 1.036]	1.021 [1.010; 1.033]	1.016 [1.000; 1.032]	1.018 [1.003; 1.033]	1.021 [1.004; 1.038]	1.021 [1.003; 1.040]
Kiribati	1.067 [1.058; 1.077]	1.067 [1.046; 1.089]	1.067 [1.040; 1.095]	1.067 [1.040; 1.096]	1.067 [1.040; 1.095]	1.067 [1.040; 1.095]
Kuwait	1.050 [1.044; 1.056]	1.044 [1.035; 1.053]	1.041 [1.031; 1.051]	1.042 [1.033; 1.050]	1.043 [1.035; 1.051]	1.046 [1.034; 1.059]
Kyrgyz Republic	1.062 [1.050; 1.075]	1.056 [1.046; 1.066]	1.052 [1.044; 1.061]	1.054 [1.045; 1.063]	1.057 [1.048; 1.066]	1.060 [1.047; 1.072]
Laos	1.063 [1.055; 1.072]	1.055 [1.039; 1.070]	1.053 [1.032; 1.073]	1.051 [1.032; 1.070]	1.051 [1.032; 1.070]	1.054 [1.033; 1.075]
Latvia	1.058 [1.055; 1.061]	1.056 [1.048; 1.065]	1.053 [1.044; 1.062]	1.054 [1.043; 1.064]	1.053 [1.043; 1.064]	1.059 [1.045; 1.074]
Lebanon	1.050 [1.044; 1.056]	1.056 [1.047; 1.065]	1.049 [1.034; 1.066]	1.038 [1.028; 1.047]	1.038 [1.030; 1.047]	1.052 [1.037; 1.066]
Lesotho	1.031 [1.027; 1.036]	1.028 [1.013; 1.044]	1.029 [1.009; 1.050]	1.030 [1.010; 1.049]	1.028 [1.008; 1.048]	1.027 [1.006; 1.050]
Liberia	1.031 [1.027; 1.036]	1.036 [1.022; 1.051]	1.038 [1.019; 1.058]	1.039 [1.021; 1.058]	1.039 [1.020; 1.058]	1.038 [1.017; 1.059]
Libya	1.050 [1.036; 1.064]	1.055 [1.045; 1.065]	1.061 [1.053; 1.070]	1.068 [1.057; 1.080]	1.057 [1.045; 1.070]	1.056 [1.039; 1.074]
Lithuania	1.058 [1.055; 1.061]	1.053 [1.045; 1.062]	1.055 [1.047; 1.063]	1.061 [1.052; 1.070]	1.053 [1.044; 1.062]	1.053 [1.040; 1.067]
Luxembourg	1.058 [1.055; 1.061]	1.060 [1.050; 1.069]	1.060 [1.046; 1.074]	1.064 [1.050; 1.078]	1.058 [1.044; 1.072]	1.060 [1.043; 1.076]
Macao, SAR of China	1.063 [1.054; 1.072]	1.075 [1.063; 1.086]	1.072 [1.058; 1.086]	1.082 [1.066; 1.097]	1.087 [1.072; 1.102]	1.084 [1.068; 1.102]
Macedonia	1.058 [1.055; 1.061]	1.072 [1.062; 1.083]	1.085 [1.074; 1.095]	1.077 [1.067; 1.088]	1.075 [1.065; 1.085]	1.073 [1.060; 1.087]
Madagascar	1.031 [1.027; 1.036]	1.036 [1.023; 1.050]	1.041 [1.024; 1.058]	1.036 [1.020; 1.053]	1.036 [1.018; 1.055]	1.036 [1.016; 1.055]
Malawi	1.031 [1.027; 1.036]	1.016 [1.005; 1.028]	1.017 [1.002; 1.032]	1.010 [0.997; 1.023]	1.008 [0.994; 1.022]	1.013 [0.996; 1.030]
Malaysia	1.063 [1.055; 1.072]	1.061 [1.053; 1.069]	1.067 [1.059; 1.076]	1.069 [1.060; 1.077]	1.068 [1.059; 1.077]	1.066 [1.053; 1.080]
Maldives	1.052 [1.040; 1.063]	1.062 [1.050; 1.073]	1.064 [1.052; 1.077]	1.063 [1.049; 1.076]	1.069 [1.054; 1.083]	1.066 [1.049; 1.083]

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Table 20 – continued from previous page

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
Mali	1.031 [1.027; 1.036]	1.031 [1.013; 1.050]	1.038 [1.015; 1.061]	1.042 [1.019; 1.066]	1.036 [1.013; 1.060]	1.033 [1.009; 1.058]
Malta	1.058 [1.055; 1.061]	1.066 [1.056; 1.075]	1.065 [1.049; 1.081]	1.062 [1.048; 1.077]	1.067 [1.052; 1.083]	1.067 [1.050; 1.085]
Marshall Islands	1.067 [1.058; 1.077]	1.066 [1.045; 1.087]	1.066 [1.039; 1.093]	1.065 [1.038; 1.092]	1.066 [1.038; 1.093]	1.066 [1.039; 1.093]
Martinique	1.041 [1.037; 1.045]	1.028 [1.018; 1.038]	1.025 [1.010; 1.040]	1.029 [1.015; 1.044]	1.031 [1.014; 1.048]	1.029 [1.011; 1.048]
Mauritania	1.031 [1.027; 1.036]	1.032 [1.013; 1.051]	1.035 [1.011; 1.060]	1.034 [1.010; 1.059]	1.033 [1.009; 1.058]	1.032 [1.007; 1.058]
Mauritius	1.031 [1.027; 1.036]	1.035 [1.026; 1.043]	1.036 [1.026; 1.046]	1.038 [1.028; 1.048]	1.033 [1.022; 1.044]	1.037 [1.023; 1.051]
Mayotte	1.031 [1.027; 1.036]	1.031 [1.012; 1.051]	1.031 [1.006; 1.057]	1.031 [1.006; 1.057]	1.031 [1.005; 1.057]	1.031 [1.005; 1.056]
Mexico	1.041 [1.037; 1.045]	1.037 [1.021; 1.054]	1.036 [1.014; 1.059]	1.037 [1.014; 1.060]	1.037 [1.014; 1.061]	1.037 [1.015; 1.061]
Micronesia	1.067 [1.058; 1.077]	1.067 [1.046; 1.089]	1.067 [1.040; 1.095]	1.067 [1.040; 1.095]	1.067 [1.039; 1.095]	1.067 [1.040; 1.095]
Monaco	1.058 [1.055; 1.061]	1.048 [1.031; 1.064]	1.045 [1.024; 1.068]	1.042 [1.022; 1.063]	1.042 [1.022; 1.063]	1.044 [1.022; 1.065]
Mongolia	1.063 [1.054; 1.072]	1.046 [1.037; 1.055]	1.040 [1.031; 1.048]	1.037 [1.029; 1.046]	1.043 [1.034; 1.052]	1.051 [1.039; 1.064]
Montenegro	1.058 [1.055; 1.061]	1.055 [1.037; 1.072]	1.090 [1.054; 1.128]	1.098 [1.072; 1.125]	1.090 [1.067; 1.114]	1.072 [1.045; 1.100]
Morocco	1.050 [1.036; 1.064]	1.047 [1.026; 1.068]	1.043 [1.018; 1.067]	1.045 [1.022; 1.068]	1.054 [1.022; 1.132]	1.069 [1.026; 1.171]
Mozambique	1.031 [1.027; 1.036]	1.021 [1.007; 1.035]	1.021 [1.003; 1.039]	1.012 [0.996; 1.029]	1.016 [0.998; 1.035]	1.018 [0.999; 1.038]
Myanmar	1.063 [1.055; 1.072]	1.065 [1.046; 1.084]	1.065 [1.041; 1.090]	1.066 [1.043; 1.091]	1.066 [1.042; 1.090]	1.066 [1.042; 1.092]
Namibia	1.031 [1.027; 1.036]	1.013 [0.997; 1.028]	1.003 [0.985; 1.022]	1.008 [0.989; 1.027]	1.009 [0.990; 1.029]	1.011 [0.990; 1.032]
Nauru	1.067 [1.058; 1.077]	1.069 [1.049; 1.089]	1.069 [1.043; 1.095]	1.068 [1.043; 1.094]	1.069 [1.044; 1.095]	1.069 [1.043; 1.095]
Nepal	1.052 [1.040; 1.063]	1.049 [1.030; 1.070]	1.045 [1.020; 1.070]	1.047 [1.023; 1.073]	1.056 [1.028; 1.090]	1.073 [1.034; 1.135]
Netherlands	1.058 [1.055; 1.061]	1.056 [1.051; 1.062]	1.049 [1.043; 1.055]	1.050 [1.044; 1.056]	1.048 [1.042; 1.054]	1.054 [1.044; 1.064]
New Caledonia	1.067 [1.058; 1.077]	1.062 [1.050; 1.074]	1.065 [1.049; 1.082]	1.059 [1.044; 1.074]	1.064 [1.048; 1.080]	1.060 [1.042; 1.080]
New Zealand	1.058 [1.055; 1.061]	1.056 [1.048; 1.064]	1.055 [1.047; 1.062]	1.052 [1.044; 1.060]	1.056 [1.044; 1.068]	1.056 [1.043; 1.069]
Nicaragua	1.041 [1.037; 1.045]	1.035 [1.022; 1.050]	1.034 [1.017; 1.051]	1.031 [1.014; 1.050]	1.033 [1.013; 1.055]	1.034 [1.013; 1.056]
Niger	1.031 [1.027; 1.036]	1.039 [1.026; 1.052]	1.042 [1.026; 1.059]	1.042 [1.026; 1.058]	1.041 [1.023; 1.059]	1.040 [1.020; 1.060]
Nigeria	1.031 [1.027; 1.036]	1.037 [1.019; 1.056]	1.052 [1.029; 1.076]	1.044 [1.022; 1.066]	1.037 [1.014; 1.060]	1.036 [1.012; 1.061]
Niue	1.067 [1.058; 1.077]	1.068 [1.048; 1.089]	1.068 [1.041; 1.095]	1.068 [1.042; 1.095]	1.068 [1.042; 1.095]	1.068 [1.042; 1.095]
Norway	1.058 [1.055; 1.061]	1.059 [1.054; 1.065]	1.057 [1.049; 1.065]	1.054 [1.047; 1.063]	1.056 [1.048; 1.064]	1.057 [1.044; 1.070]
Oman	1.050 [1.044; 1.056]	1.043 [1.032; 1.055]	1.042 [1.022; 1.062]	1.039 [1.024; 1.055]	1.039 [1.031; 1.047]	1.043 [1.032; 1.054]
Pakistan	1.052 [1.040; 1.063]	1.056 [1.037; 1.078]	1.076 [1.054; 1.100]	1.082 [1.060; 1.106]	1.070 [1.045; 1.097]	1.064 [1.037; 1.104]
Palau	1.067 [1.058; 1.077]	1.070 [1.050; 1.091]	1.071 [1.045; 1.097]	1.071 [1.045; 1.098]	1.070 [1.044; 1.097]	1.070 [1.044; 1.097]

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Table 20 – continued from previous page

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
Panama	1.041 [1.037; 1.045]	1.046 [1.037; 1.054]	1.049 [1.041; 1.058]	1.054 [1.045; 1.063]	1.048 [1.039; 1.056]	1.050 [1.037; 1.063]
Papua New Guinea	1.067 [1.058; 1.077]	1.067 [1.046; 1.089]	1.067 [1.040; 1.096]	1.067 [1.039; 1.095]	1.067 [1.040; 1.095]	1.067 [1.039; 1.095]
Paraguay	1.041 [1.037; 1.045]	1.048 [1.034; 1.064]	1.053 [1.034; 1.071]	1.054 [1.034; 1.074]	1.052 [1.031; 1.073]	1.051 [1.029; 1.073]
Peru	1.041 [1.037; 1.045]	1.041 [1.030; 1.052]	1.043 [1.030; 1.056]	1.039 [1.025; 1.053]	1.039 [1.023; 1.056]	1.040 [1.021; 1.059]
Philippines	1.063 [1.055; 1.072]	1.076 [1.065; 1.087]	1.075 [1.061; 1.089]	1.081 [1.066; 1.096]	1.082 [1.066; 1.099]	1.080 [1.061; 1.099]
Poland	1.058 [1.055; 1.061]	1.063 [1.055; 1.070]	1.059 [1.055; 1.064]	1.061 [1.056; 1.066]	1.069 [1.065; 1.074]	1.059 [1.048; 1.069]
Portugal	1.058 [1.055; 1.061]	1.064 [1.057; 1.070]	1.061 [1.054; 1.067]	1.071 [1.065; 1.078]	1.049 [1.042; 1.056]	1.054 [1.042; 1.066]
Puerto Rico	1.041 [1.037; 1.045]	1.050 [1.042; 1.058]	1.055 [1.047; 1.062]	1.059 [1.051; 1.067]	1.058 [1.049; 1.067]	1.057 [1.043; 1.071]
Qatar	1.050 [1.044; 1.056]	1.046 [1.036; 1.057]	1.048 [1.036; 1.060]	1.044 [1.033; 1.056]	1.042 [1.031; 1.052]	1.044 [1.030; 1.059]
Republic of Korea	1.063 [1.054; 1.072]	1.064 [1.044; 1.083]	1.151 [1.131; 1.171]	1.099 [1.079; 1.119]	1.065 [1.045; 1.085]	1.056 [1.034; 1.078]
Republic of Moldova	1.058 [1.055; 1.061]	1.061 [1.051; 1.071]	1.055 [1.047; 1.063]	1.068 [1.059; 1.077]	1.063 [1.054; 1.072]	1.062 [1.047; 1.077]
Republic of the Congo	1.031 [1.027; 1.036]	1.026 [1.011; 1.042]	1.025 [1.004; 1.046]	1.025 [1.005; 1.045]	1.025 [1.004; 1.045]	1.025 [1.004; 1.048]
Reunion	1.031 [1.027; 1.036]	1.031 [1.022; 1.040]	1.033 [1.018; 1.048]	1.039 [1.027; 1.050]	1.040 [1.025; 1.056]	1.035 [1.017; 1.054]
Romania	1.058 [1.055; 1.061]	1.059 [1.051; 1.066]	1.051 [1.046; 1.056]	1.062 [1.057; 1.068]	1.059 [1.053; 1.065]	1.061 [1.050; 1.073]
Russian Federation	1.058 [1.055; 1.061]	1.056 [1.048; 1.064]	1.056 [1.053; 1.059]	1.064 [1.061; 1.067]	1.058 [1.055; 1.061]	1.059 [1.047; 1.071]
Rwanda	1.031 [1.027; 1.036]	1.026 [1.013; 1.039]	1.024 [1.007; 1.041]	1.027 [1.011; 1.044]	1.027 [1.010; 1.043]	1.027 [1.009; 1.046]
Saint Kitts and Nevis	1.041 [1.037; 1.045]	1.037 [1.022; 1.052]	1.038 [1.019; 1.058]	1.034 [1.013; 1.055]	1.036 [1.014; 1.058]	1.037 [1.014; 1.059]
Saint Lucia	1.041 [1.037; 1.045]	1.034 [1.023; 1.046]	1.031 [1.016; 1.046]	1.033 [1.018; 1.049]	1.038 [1.019; 1.057]	1.036 [1.016; 1.056]
Saint Vincent and the Grenadines	1.041 [1.037; 1.045]	1.032 [1.019; 1.044]	1.029 [1.012; 1.047]	1.032 [1.015; 1.049]	1.028 [1.011; 1.046]	1.029 [1.010; 1.048]
Samoa	1.067 [1.058; 1.077]	1.071 [1.058; 1.086]	1.073 [1.054; 1.092]	1.073 [1.057; 1.089]	1.067 [1.049; 1.085]	1.067 [1.048; 1.087]
San Marino	1.058 [1.055; 1.061]	1.066 [1.049; 1.083]	1.067 [1.044; 1.091]	1.068 [1.045; 1.092]	1.068 [1.045; 1.091]	1.067 [1.043; 1.091]
Sao Tome and Principe	1.031 [1.027; 1.036]	1.027 [1.011; 1.043]	1.026 [1.005; 1.049]	1.027 [1.005; 1.049]	1.028 [1.006; 1.051]	1.028 [1.005; 1.051]
Saudi Arabia	1.050 [1.044; 1.056]	1.050 [1.039; 1.060]	1.050 [1.035; 1.065]	1.050 [1.046; 1.054]	1.050 [1.042; 1.058]	1.050 [1.033; 1.066]
Senegal	1.031 [1.027; 1.036]	1.031 [1.013; 1.049]	1.030 [1.008; 1.052]	1.036 [1.013; 1.059]	1.036 [1.014; 1.059]	1.033 [1.010; 1.057]
Serbia	1.058 [1.055; 1.061]	1.069 [1.056; 1.083]	1.074 [1.057; 1.091]	1.076 [1.062; 1.091]	1.072 [1.052; 1.092]	1.071 [1.049; 1.092]
Seychelles	1.031 [1.027; 1.036]	1.034 [1.021; 1.047]	1.037 [1.020; 1.054]	1.034 [1.017; 1.052]	1.032 [1.014; 1.050]	1.034 [1.014; 1.053]
Sierra Leone	1.031 [1.027; 1.036]	1.033 [1.019; 1.047]	1.035 [1.015; 1.055]	1.034 [1.017; 1.051]	1.032 [1.015; 1.049]	1.032 [1.013; 1.051]
Singapore	1.063 [1.055; 1.072]	1.061 [1.049; 1.073]	1.072 [1.057; 1.087]	1.076 [1.061; 1.092]	1.068 [1.053; 1.084]	1.065 [1.047; 1.082]
Slovakia	1.058 [1.055; 1.061]	1.057 [1.049; 1.065]	1.052 [1.045; 1.059]	1.054 [1.046; 1.062]	1.046 [1.038; 1.054]	1.055 [1.042; 1.068]

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Table 20 – continued from previous page

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
Slovenia	1.058 [1.055; 1.061]	1.059 [1.051; 1.067]	1.058 [1.048; 1.068]	1.062 [1.051; 1.072]	1.058 [1.048; 1.068]	1.059 [1.044; 1.073]
Solomon Islands	1.067 [1.058; 1.077]	1.067 [1.046; 1.089]	1.067 [1.040; 1.095]	1.067 [1.040; 1.096]	1.067 [1.041; 1.095]	1.067 [1.040; 1.096]
Somalia	1.031 [1.027; 1.036]	1.042 [1.025; 1.061]	1.048 [1.025; 1.072]	1.047 [1.024; 1.070]	1.045 [1.021; 1.069]	1.043 [1.019; 1.068]
South Africa	1.031 [1.027; 1.036]	1.032 [1.015; 1.049]	1.031 [1.009; 1.053]	1.031 [1.008; 1.054]	1.031 [1.008; 1.054]	1.031 [1.008; 1.055]
South Sudan	1.031 [1.027; 1.036]	1.034 [1.017; 1.052]	1.036 [1.013; 1.059]	1.036 [1.014; 1.058]	1.034 [1.012; 1.057]	1.034 [1.012; 1.058]
Spain	1.058 [1.055; 1.061]	1.070 [1.063; 1.076]	1.070 [1.066; 1.075]	1.066 [1.061; 1.071]	1.065 [1.060; 1.069]	1.065 [1.054; 1.076]
Sri Lanka	1.052 [1.040; 1.063]	1.044 [1.035; 1.053]	1.044 [1.035; 1.052]	1.046 [1.036; 1.055]	1.042 [1.028; 1.055]	1.039 [1.025; 1.053]
State of Palestine	1.050 [1.044; 1.056]	1.050 [1.039; 1.061]	1.049 [1.034; 1.065]	1.050 [1.041; 1.059]	1.051 [1.042; 1.060]	1.053 [1.040; 1.067]
Sudan	1.031 [1.027; 1.036]	1.040 [1.027; 1.054]	1.044 [1.027; 1.063]	1.044 [1.026; 1.062]	1.041 [1.023; 1.060]	1.041 [1.021; 1.061]
Suriname	1.041 [1.037; 1.045]	1.034 [1.025; 1.044]	1.037 [1.023; 1.051]	1.039 [1.026; 1.051]	1.034 [1.021; 1.047]	1.031 [1.015; 1.047]
Swaziland	1.031 [1.027; 1.036]	1.027 [1.011; 1.044]	1.027 [1.004; 1.050]	1.025 [1.004; 1.047]	1.026 [1.004; 1.048]	1.027 [1.004; 1.050]
Sweden	1.058 [1.055; 1.061]	1.053 [1.049; 1.058]	1.057 [1.050; 1.063]	1.060 [1.053; 1.067]	1.057 [1.050; 1.064]	1.058 [1.048; 1.068]
Switzerland	1.058 [1.055; 1.061]	1.053 [1.047; 1.059]	1.051 [1.044; 1.059]	1.057 [1.049; 1.064]	1.059 [1.051; 1.066]	1.055 [1.044; 1.066]
Syria	1.050 [1.044; 1.056]	1.052 [1.037; 1.067]	1.053 [1.033; 1.073]	1.052 [1.031; 1.073]	1.052 [1.030; 1.074]	1.052 [1.030; 1.075]
Taiwan, Province of China	1.063 [1.054; 1.072]	1.063 [1.055; 1.071]	1.098 [1.088; 1.108]	1.093 [1.084; 1.103]	1.086 [1.076; 1.096]	1.076 [1.065; 1.087]
Tajikistan	1.062 [1.050; 1.075]	1.062 [1.040; 1.085]	1.061 [1.036; 1.086]	1.065 [1.038; 1.092]	1.060 [1.033; 1.089]	1.061 [1.033; 1.093]
Tanzania	1.031 [1.027; 1.036]	1.031 [1.012; 1.050]	1.028 [1.004; 1.052]	1.023 [1.000; 1.047]	1.024 [1.001; 1.048]	1.027 [1.003; 1.053]
Thailand	1.063 [1.055; 1.072]	1.064 [1.045; 1.082]	1.064 [1.039; 1.088]	1.064 [1.039; 1.088]	1.064 [1.039; 1.088]	1.064 [1.039; 1.089]
Timor-Leste	1.063 [1.055; 1.072]	1.070 [1.054; 1.086]	1.074 [1.052; 1.095]	1.074 [1.055; 1.094]	1.071 [1.052; 1.091]	1.070 [1.049; 1.093]
Togo	1.031 [1.027; 1.036]	1.029 [1.015; 1.044]	1.030 [1.010; 1.048]	1.029 [1.009; 1.048]	1.027 [1.008; 1.047]	1.028 [1.008; 1.049]
Tonga	1.067 [1.058; 1.077]	1.079 [1.064; 1.094]	1.086 [1.068; 1.104]	1.083 [1.065; 1.102]	1.080 [1.059; 1.101]	1.079 [1.057; 1.102]
Trinidad and Tobago	1.041 [1.037; 1.045]	1.039 [1.031; 1.047]	1.035 [1.025; 1.045]	1.040 [1.030; 1.051]	1.042 [1.031; 1.053]	1.040 [1.026; 1.054]
Tunisia	1.050 [1.036; 1.064]	1.046 [1.024; 1.067]	1.076 [1.052; 1.101]	1.085 [1.061; 1.108]	1.077 [1.053; 1.101]	1.054 [1.028; 1.081]
Turkey	1.050 [1.044; 1.056]	1.047 [1.028; 1.066]	1.059 [1.035; 1.084]	1.063 [1.042; 1.085]	1.056 [1.035; 1.077]	1.054 [1.030; 1.081]
Turkmenistan	1.062 [1.050; 1.075]	1.062 [1.042; 1.084]	1.062 [1.036; 1.089]	1.062 [1.036; 1.088]	1.063 [1.037; 1.090]	1.063 [1.037; 1.090]
Tuvalu	1.067 [1.058; 1.077]	1.068 [1.047; 1.090]	1.068 [1.041; 1.096]	1.068 [1.041; 1.096]	1.068 [1.041; 1.096]	1.068 [1.040; 1.096]
Uganda	1.031 [1.027; 1.036]	1.030 [1.012; 1.049]	1.019 [0.996; 1.042]	1.020 [0.998; 1.044]	1.020 [0.997; 1.043]	1.024 [1.000; 1.048]
Ukraine	1.058 [1.055; 1.061]	1.060 [1.052; 1.067]	1.059 [1.055; 1.063]	1.069 [1.065; 1.074]	1.067 [1.059; 1.074]	1.062 [1.050; 1.075]
United Kingdom	1.058 [1.055; 1.061]	1.055 [1.048; 1.062]	1.050 [1.046; 1.054]	1.052 [1.048; 1.055]	1.052 [1.048; 1.055]	1.055 [1.046; 1.063]

Continued on next page

Table 20 – continued from previous page

Country	Regional Baseline	Country Baseline	Sex Ratio at Birth			
			1990	2000	2010	2017
United States of America	1.058 [1.055; 1.061]	1.051 [1.045; 1.059]	1.049 [1.048; 1.051]	1.048 [1.046; 1.050]	1.048 [1.046; 1.050]	1.047 [1.040; 1.055]
United States Virgin Islands	1.041 [1.037; 1.045]	1.039 [1.026; 1.052]	1.040 [1.022; 1.058]	1.039 [1.020; 1.060]	1.039 [1.018; 1.061]	1.039 [1.018; 1.061]
Uruguay	1.041 [1.037; 1.045]	1.049 [1.041; 1.057]	1.049 [1.038; 1.059]	1.052 [1.043; 1.060]	1.047 [1.039; 1.056]	1.051 [1.038; 1.064]
Uzbekistan	1.062 [1.050; 1.075]	1.071 [1.059; 1.083]	1.074 [1.059; 1.088]	1.068 [1.059; 1.078]	1.074 [1.065; 1.083]	1.078 [1.064; 1.092]
Vanuatu	1.067 [1.058; 1.077]	1.067 [1.046; 1.089]	1.067 [1.040; 1.096]	1.067 [1.040; 1.095]	1.067 [1.040; 1.095]	1.067 [1.040; 1.096]
Venezuela (Bolivarian Republic of)	1.041 [1.037; 1.045]	1.048 [1.040; 1.056]	1.057 [1.049; 1.066]	1.067 [1.057; 1.077]	1.055 [1.046; 1.064]	1.054 [1.041; 1.068]
Vietnam	1.063 [1.055; 1.072]	1.063 [1.042; 1.084]	1.065 [1.039; 1.092]	1.076 [1.052; 1.099]	1.124 [1.092; 1.165]	1.122 [1.070; 1.186]
Western Sahara	1.050 [1.036; 1.064]	1.050 [1.027; 1.074]	1.050 [1.022; 1.080]	1.050 [1.022; 1.079]	1.050 [1.022; 1.079]	1.050 [1.022; 1.079]
Yemen	1.050 [1.044; 1.056]	1.058 [1.045; 1.071]	1.058 [1.042; 1.074]	1.060 [1.044; 1.077]	1.058 [1.040; 1.076]	1.058 [1.038; 1.077]
Zambia	1.031 [1.027; 1.036]	1.013 [1.000; 1.026]	1.004 [0.988; 1.019]	1.006 [0.991; 1.022]	1.013 [0.995; 1.030]	1.013 [0.995; 1.033]
Zimbabwe	1.031 [1.027; 1.036]	1.027 [1.014; 1.040]	1.026 [1.010; 1.043]	1.025 [1.009; 1.041]	1.022 [1.006; 1.039]	1.023 [1.004; 1.042]

10 Dataset S1–4: Datasets Available alongside the Article

The following data files are available alongside the article online:

- **Dataset S1:** SRB database;
- **Dataset S2:** national SRB annual estimates and 95% uncertainty intervals, 1950–2017;
- **Dataset S3:** global and regional SRB annual estimates and 95% uncertainty intervals, 1950–2017;
- **Dataset S4:** national Annual number of Missing Female Births (AMFB) estimates and 95% uncertainty intervals for the 12 countries with strong statistical evidence of SRB inflation, 1970–2017.

11 Supplementary Figures

Figure 6: **High resolution plot for main paper Figure 3: SRB in 2017 and the CMFB during 1970–2017, by country.** Countries are colored by the levels of their SRB median estimates. Radii of circles are proportional to CMFB for countries.

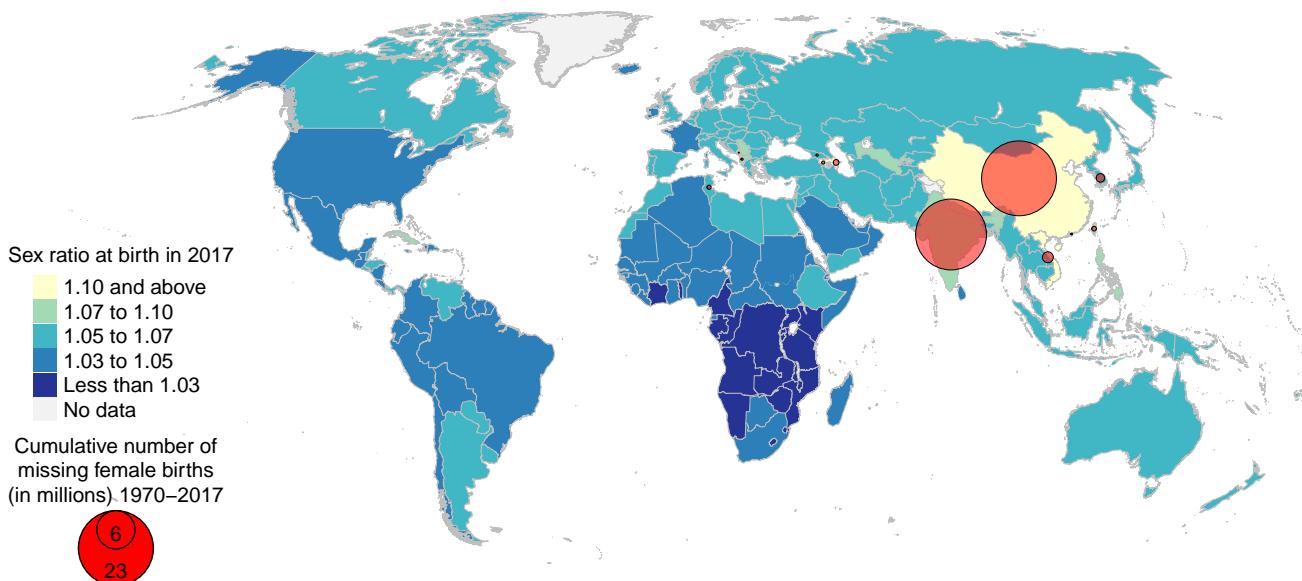
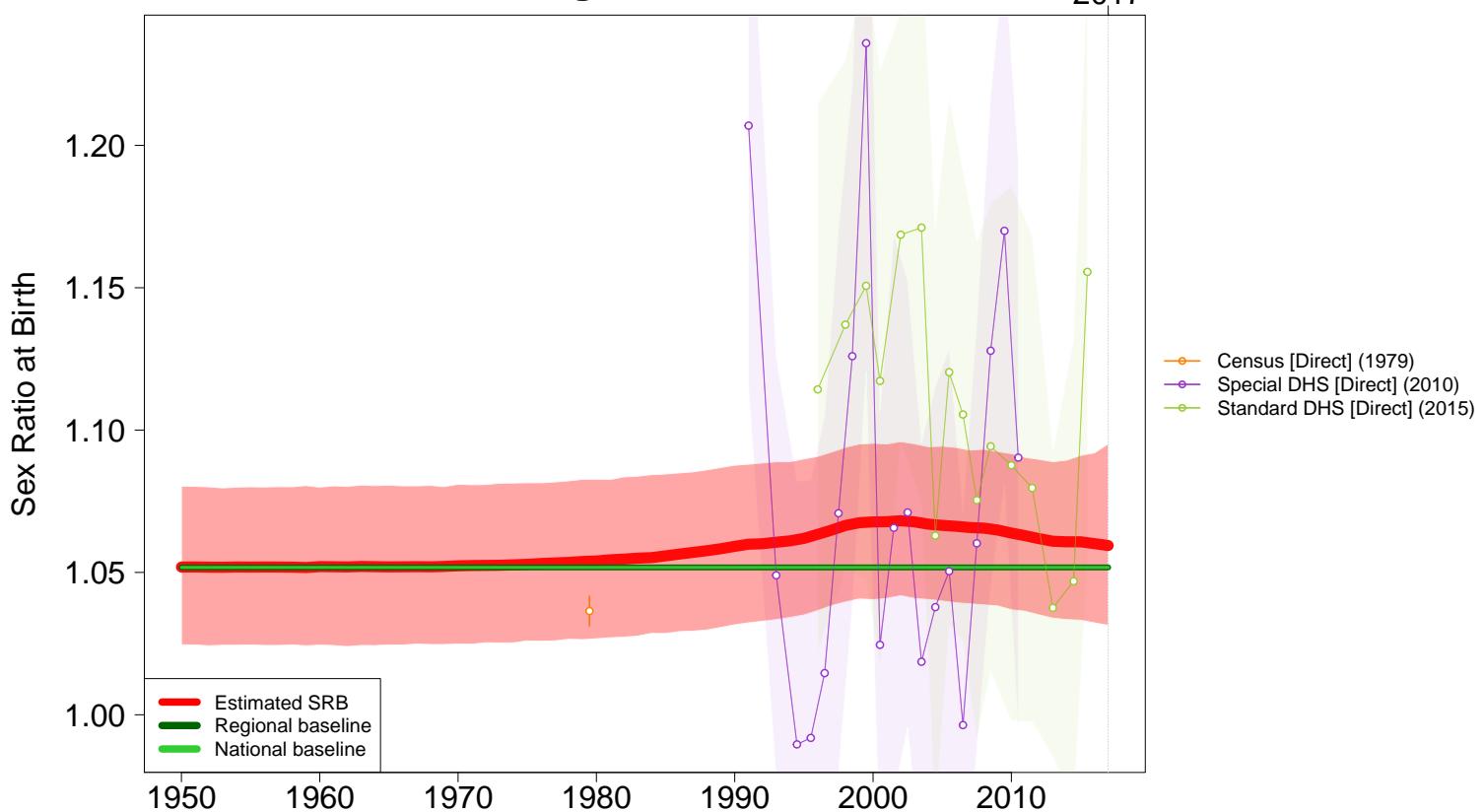


Figure 7: **SRB estimates and uncertainty intervals during 1950–2017, by country.** Red curves are median estimates of SRB and red shades are 95% uncertainty intervals. Dark green horizontal lines are the regional baselines (median estimates). Light green horizontal lines are the national baselines (median estimates). Dots with connection lines are input data series, which are differentiated by colors. Shades around the data series are sampling errors (for non-VR data) or stochastic errors (for VR data). Model estimates and uncertainty intervals are shown before 1950 if observations are available prior 1950.

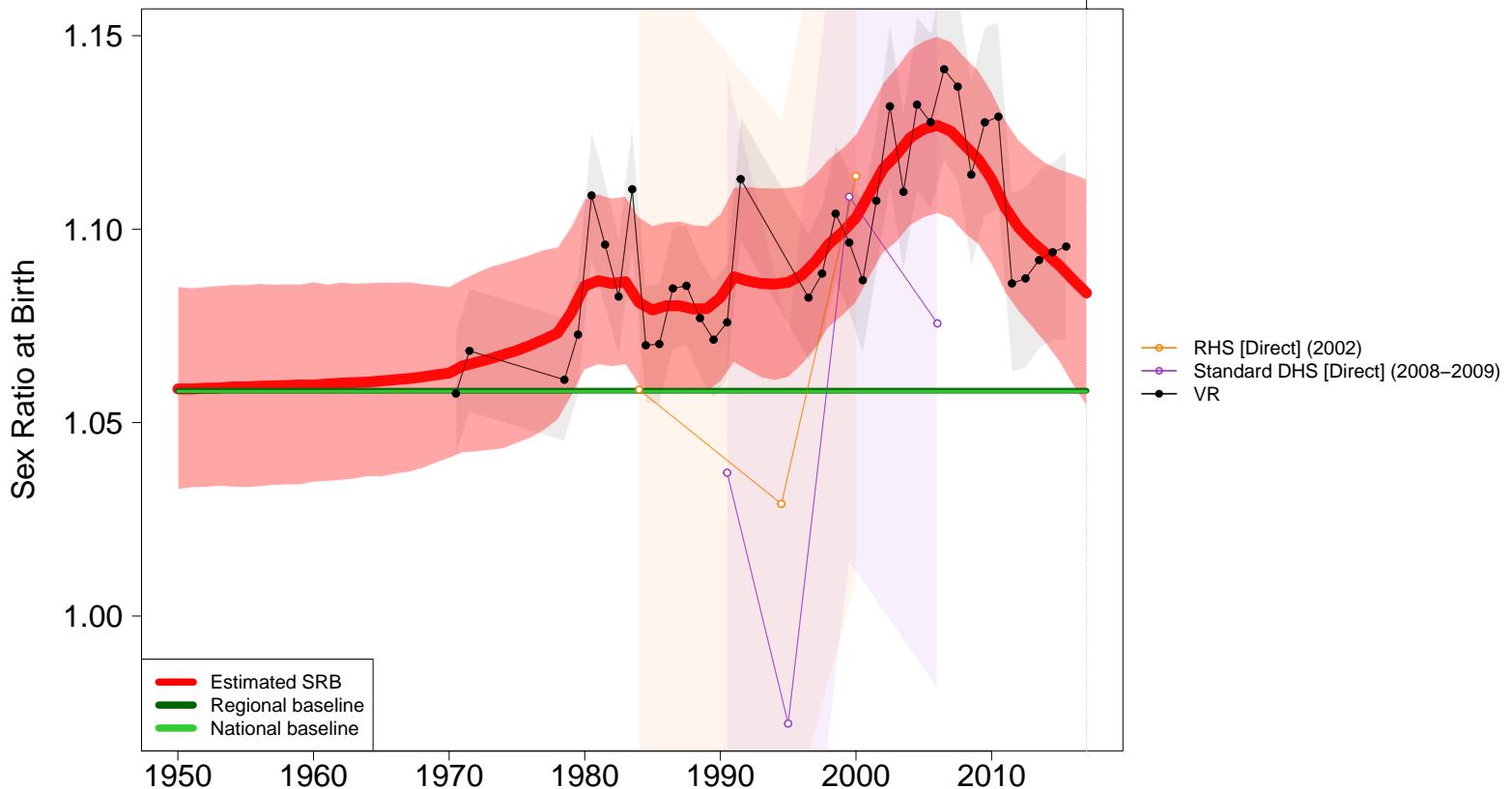
Afghanistan

2017



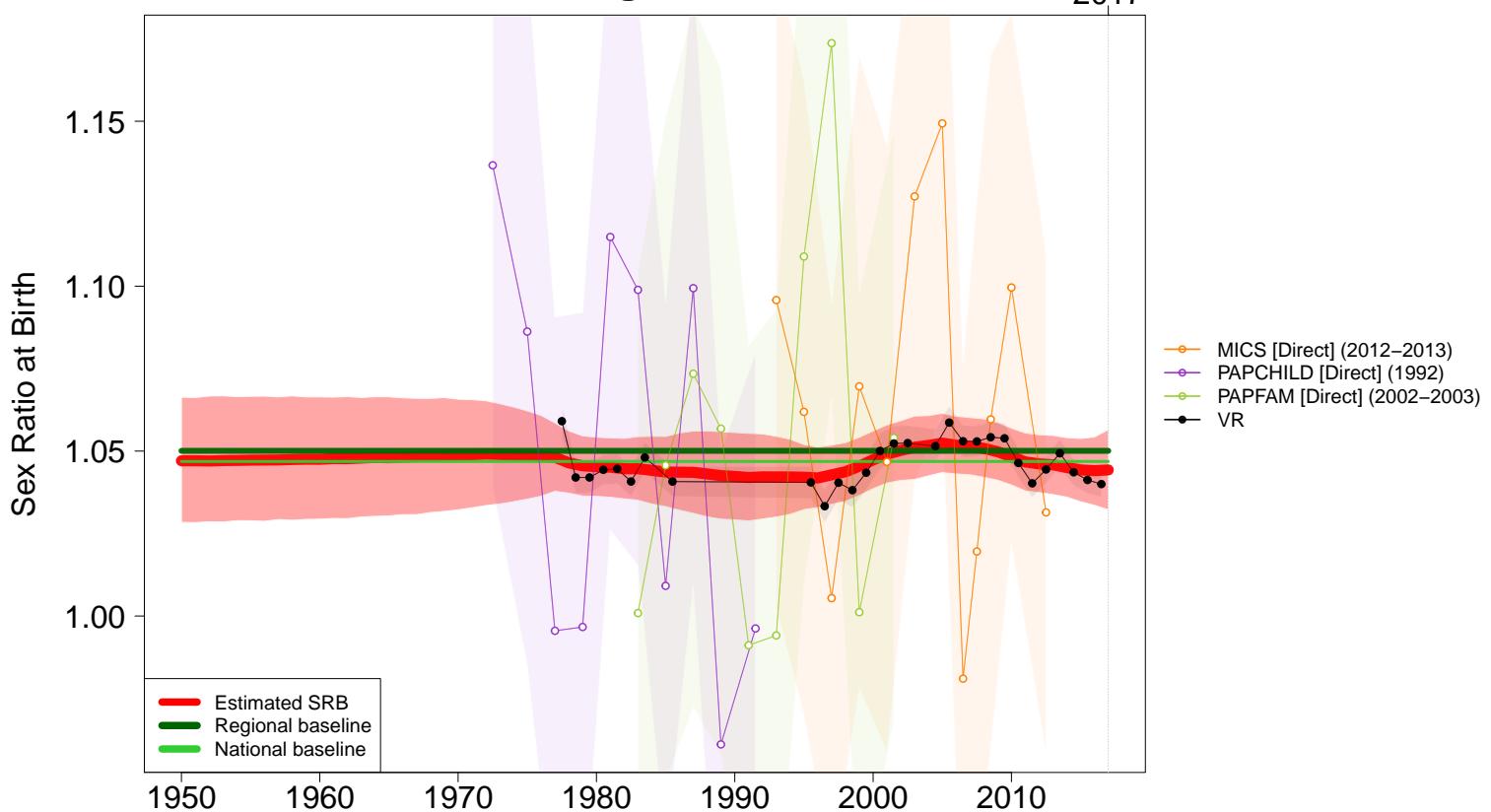
Albania

2017



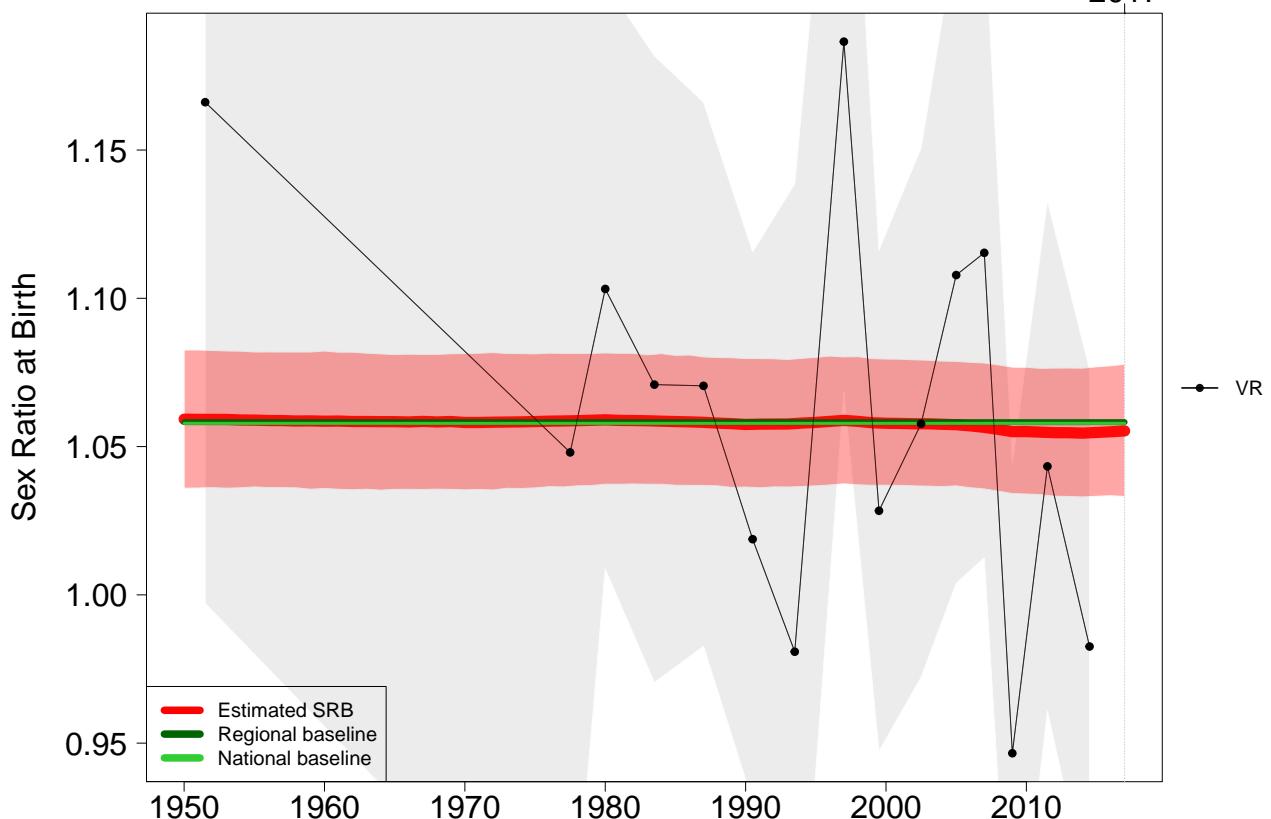
Algeria

2017



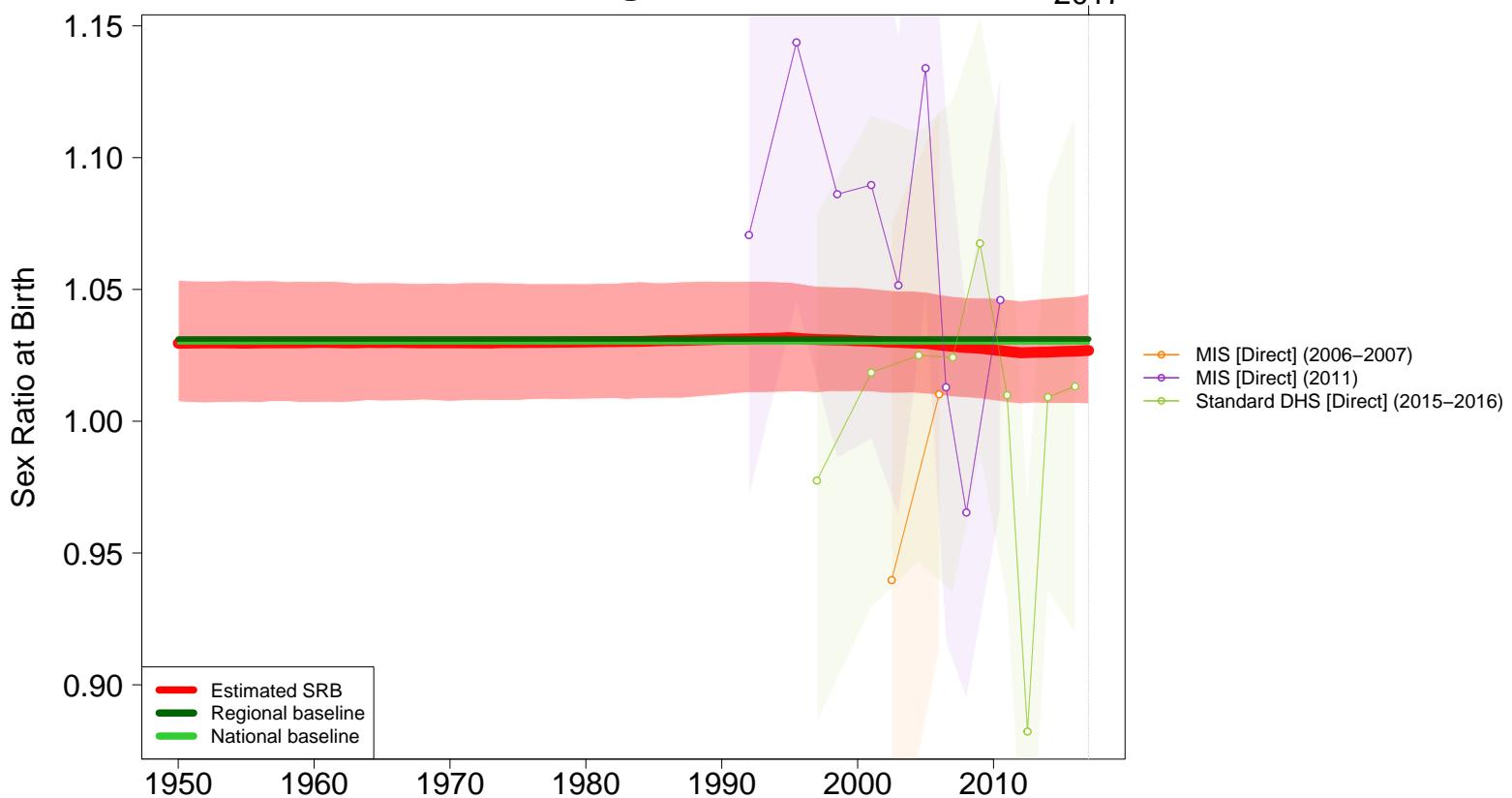
Andorra

2017



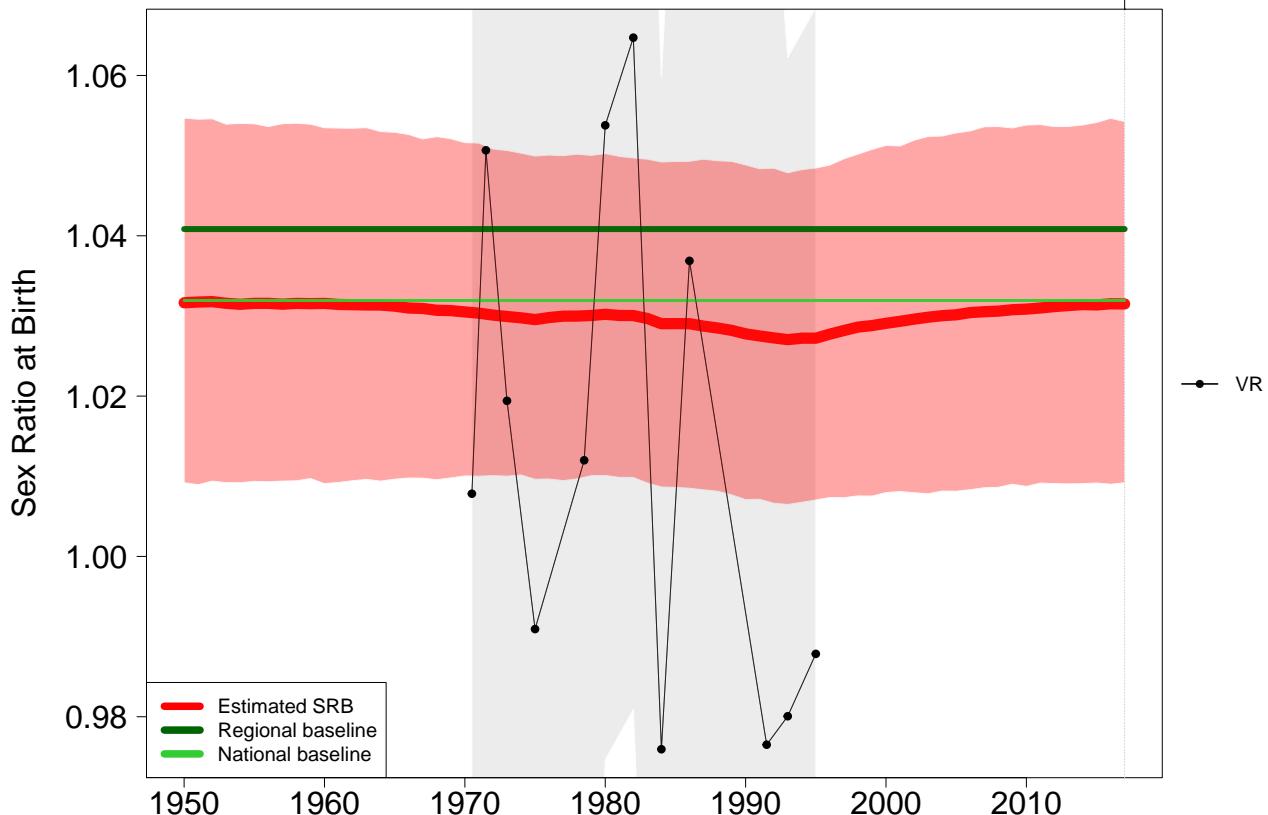
Angola

2017



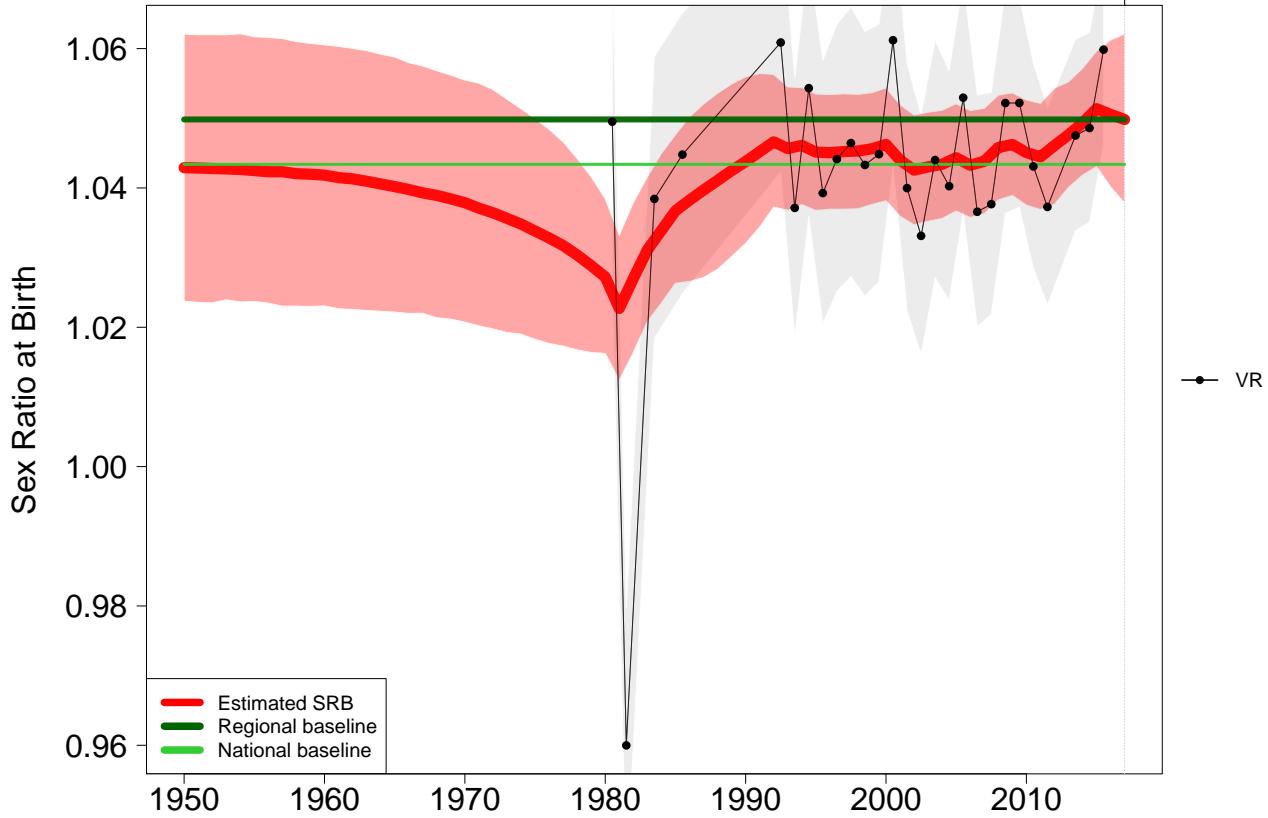
Antigua and Barbuda

2017



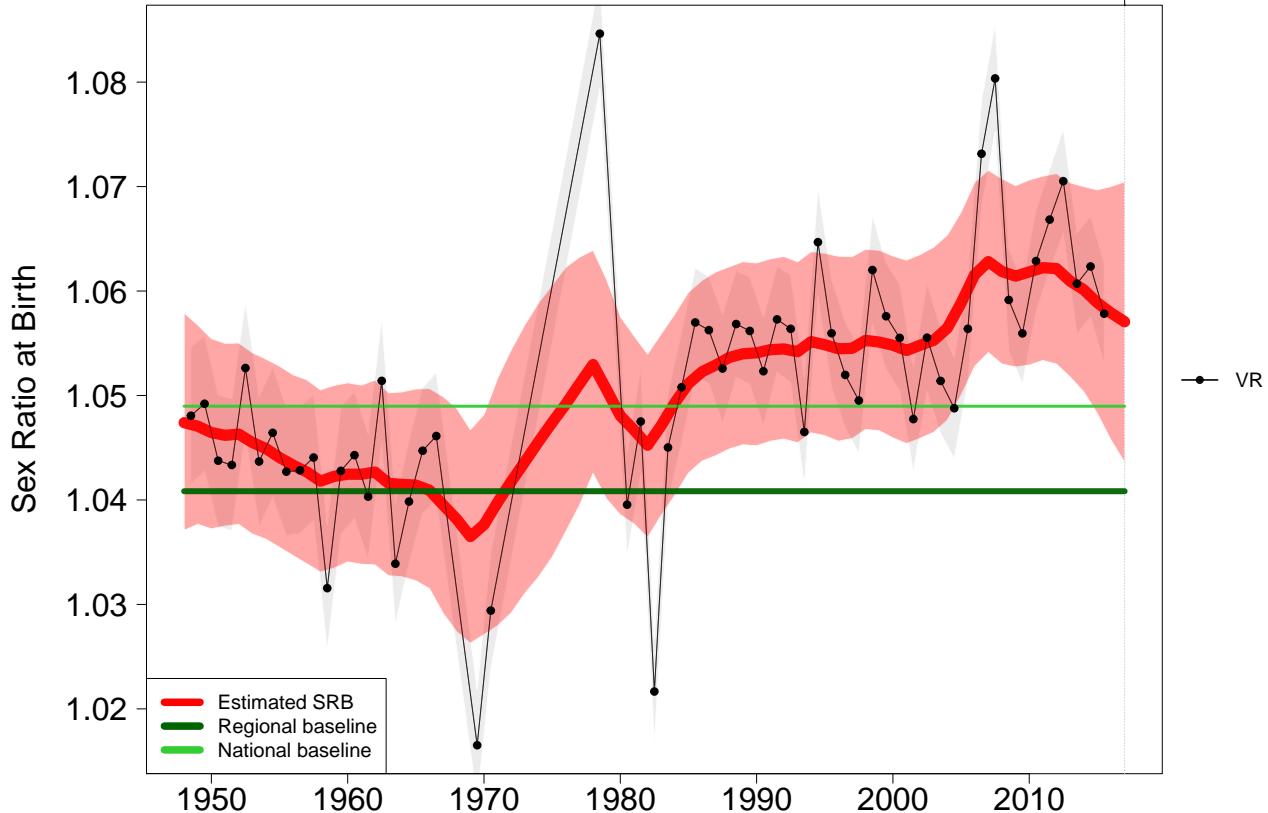
Arab Emirates

2017



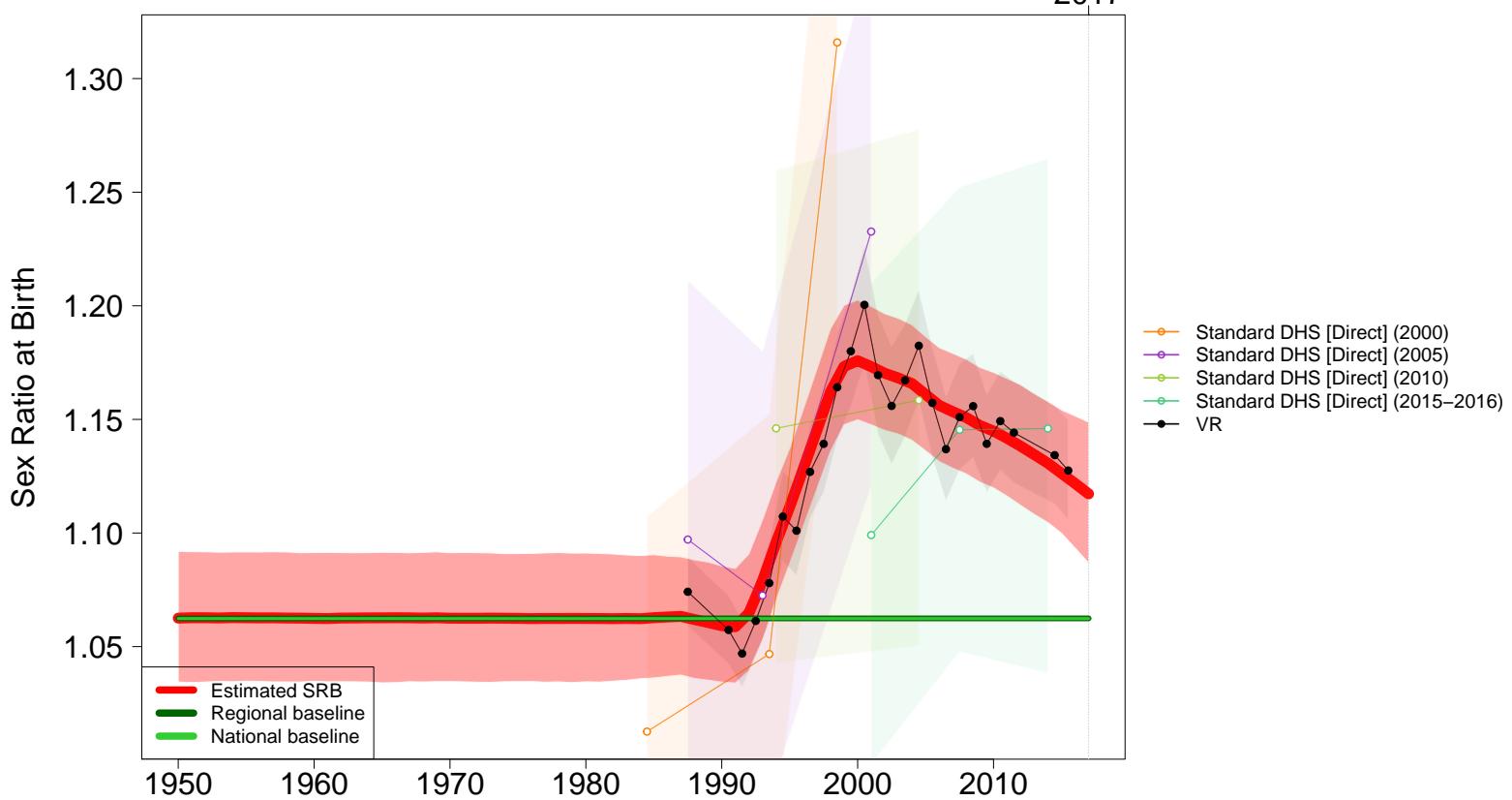
Argentina

2017



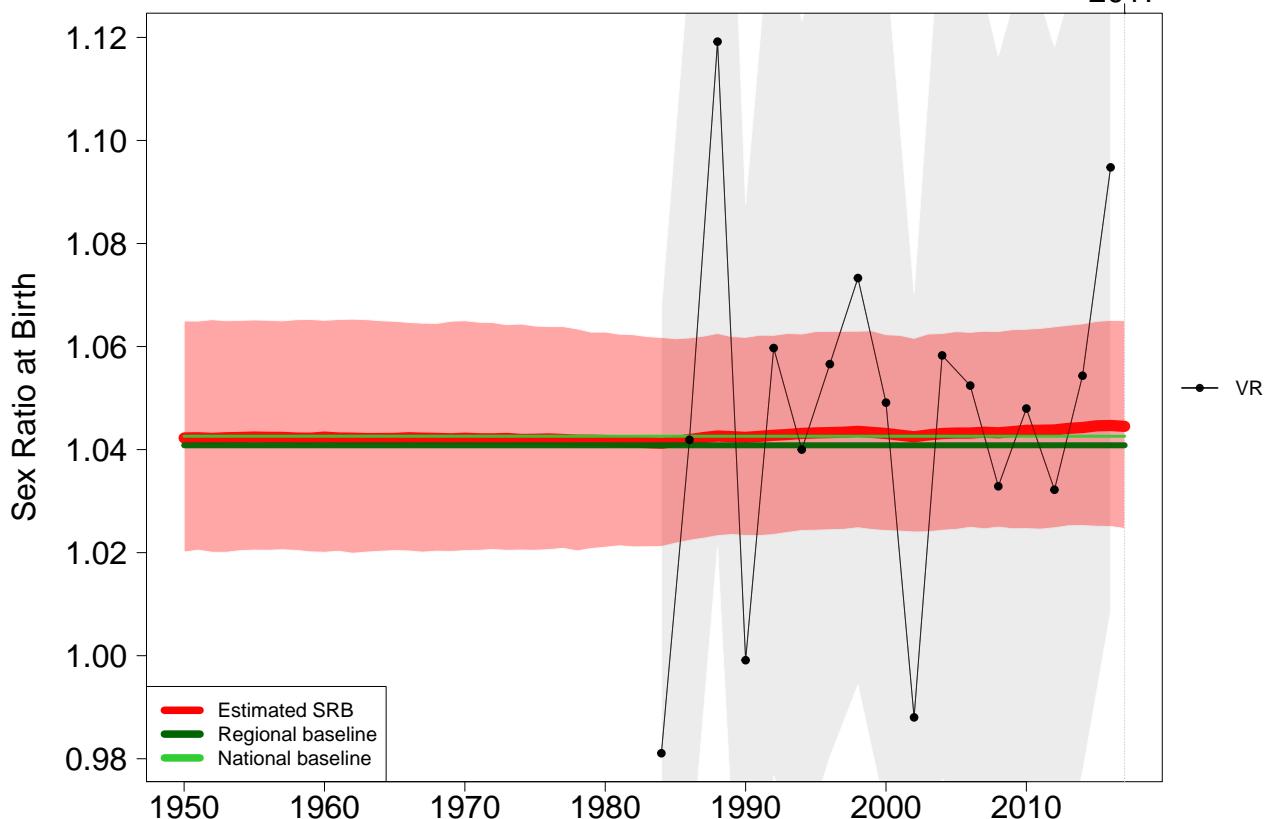
Armenia

2017



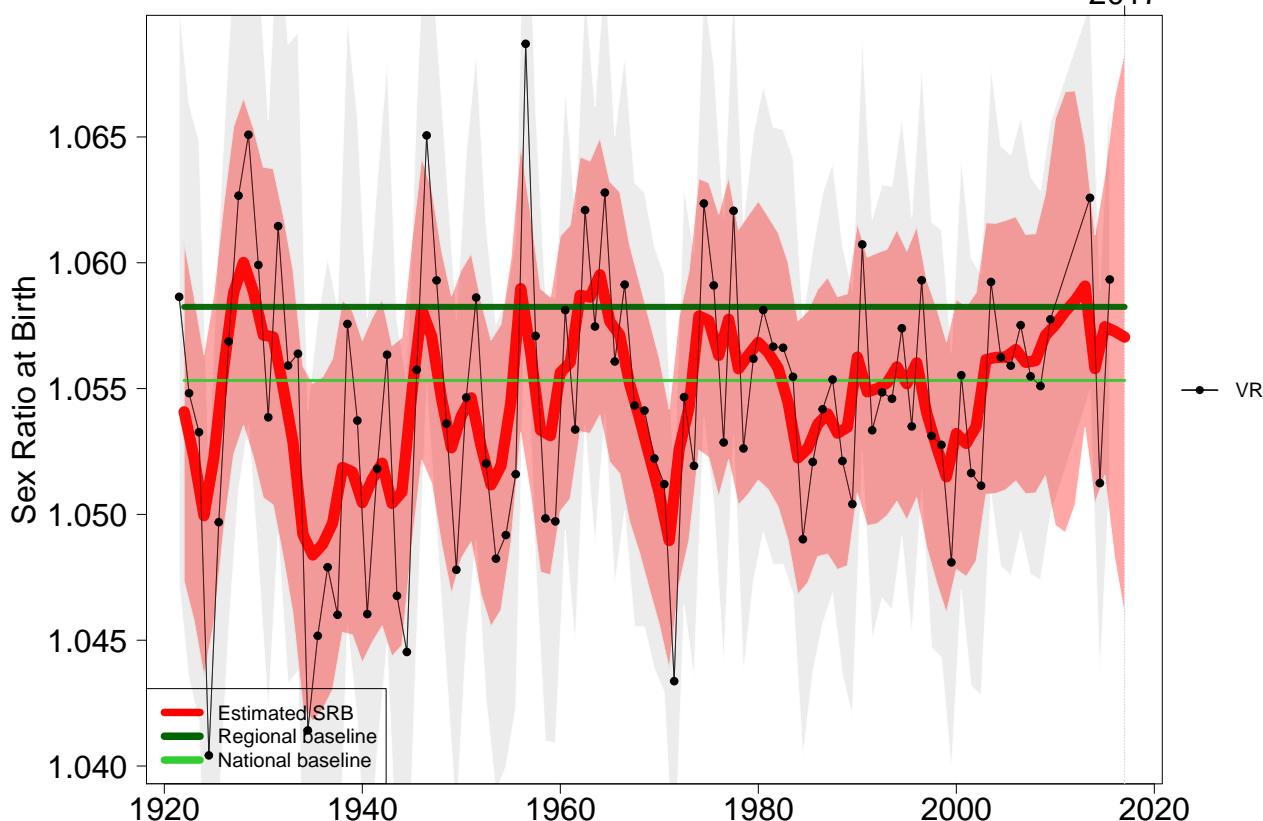
Aruba

2017



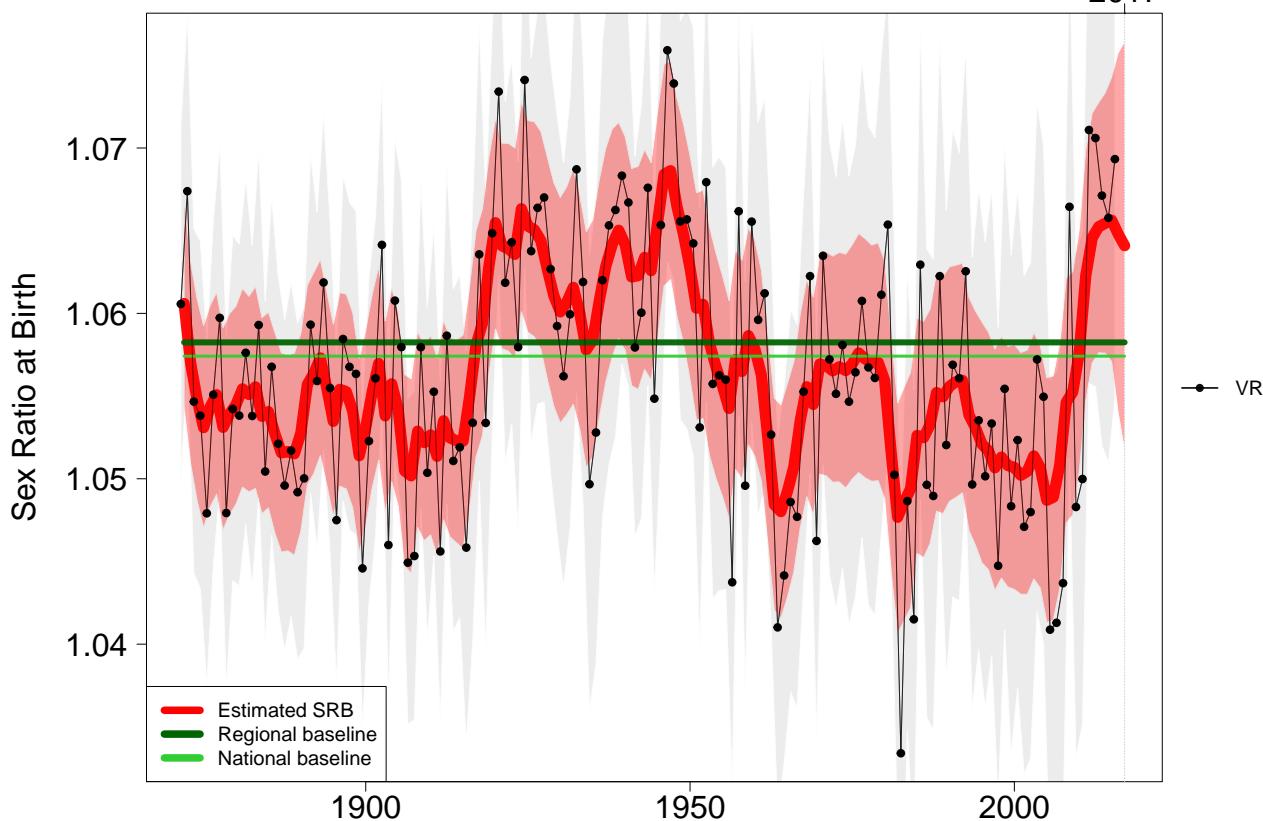
Australia

2017



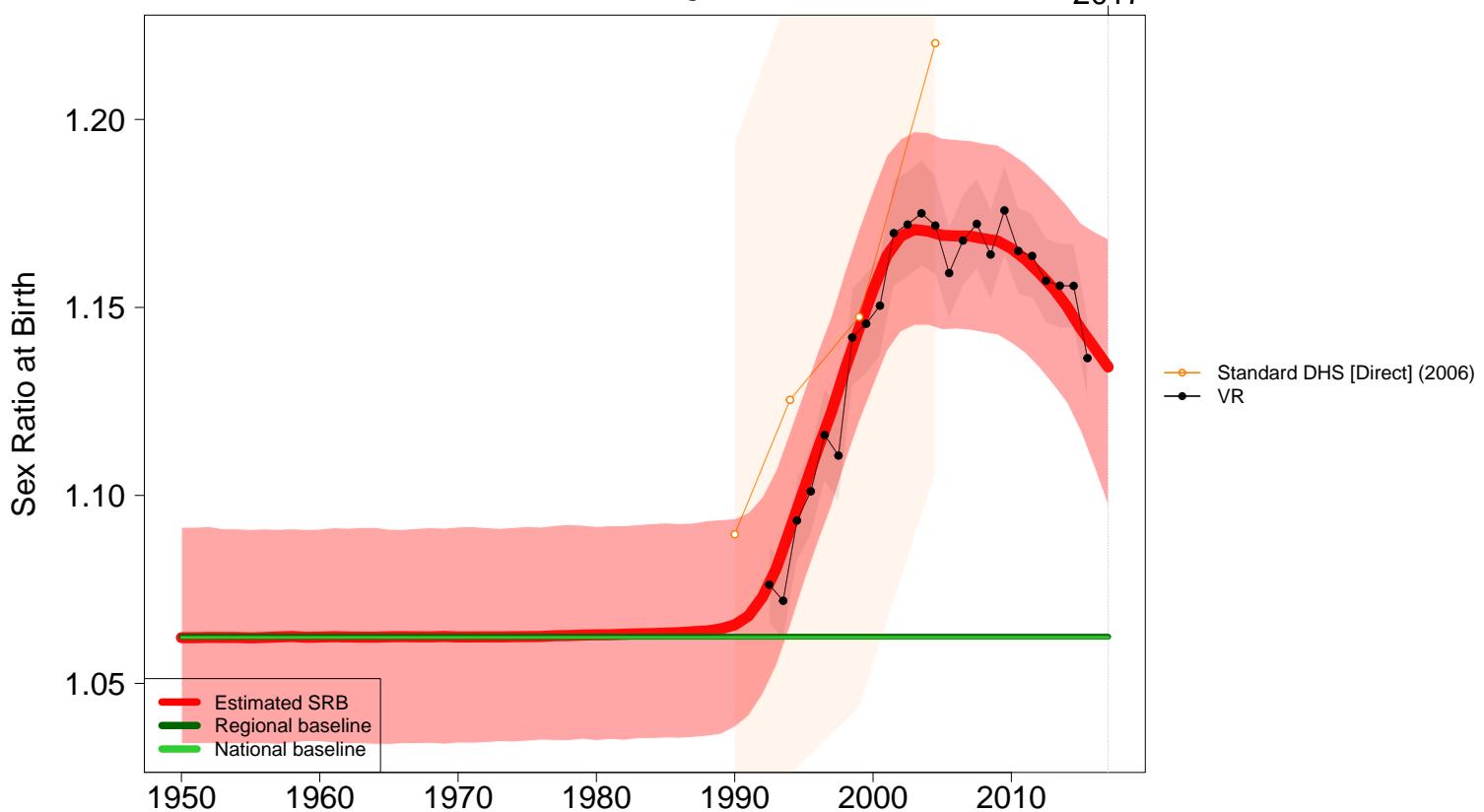
Austria

2017



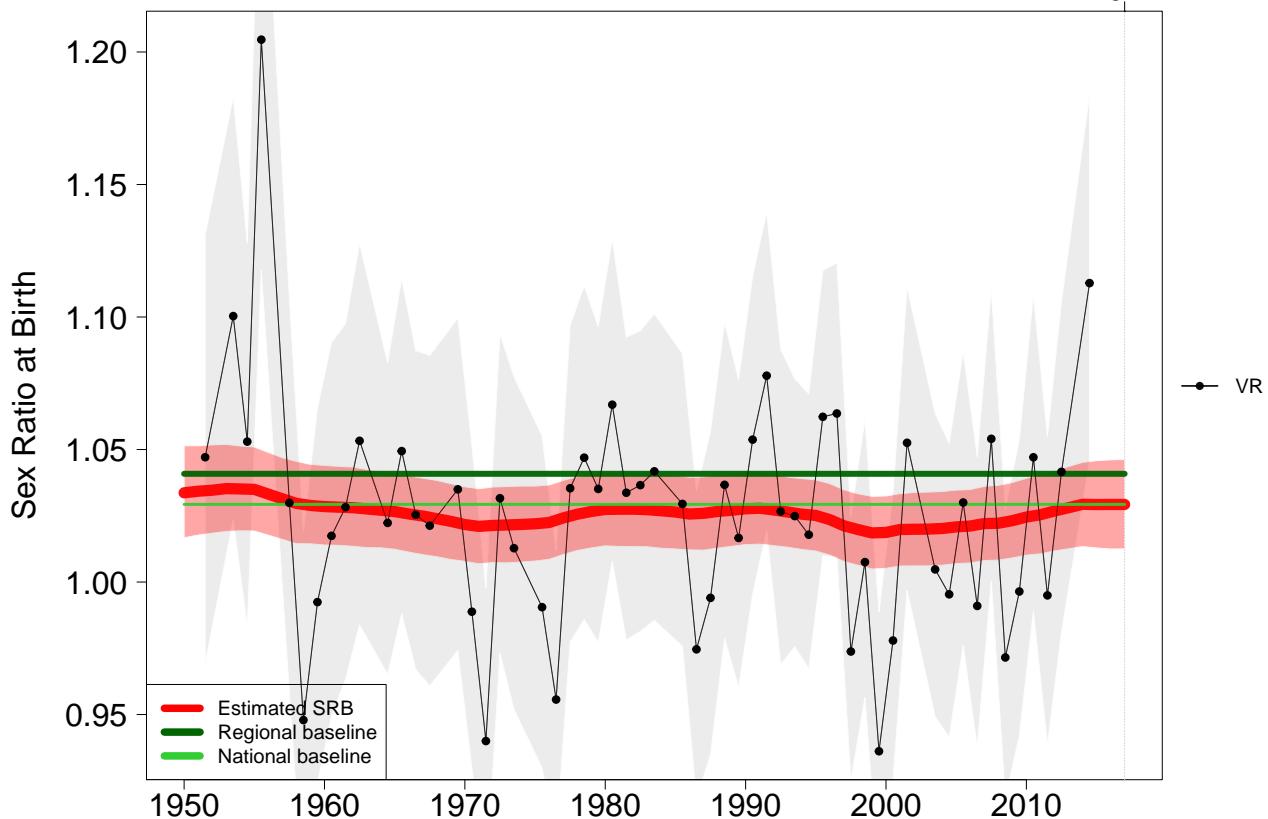
Azerbaijan

2017



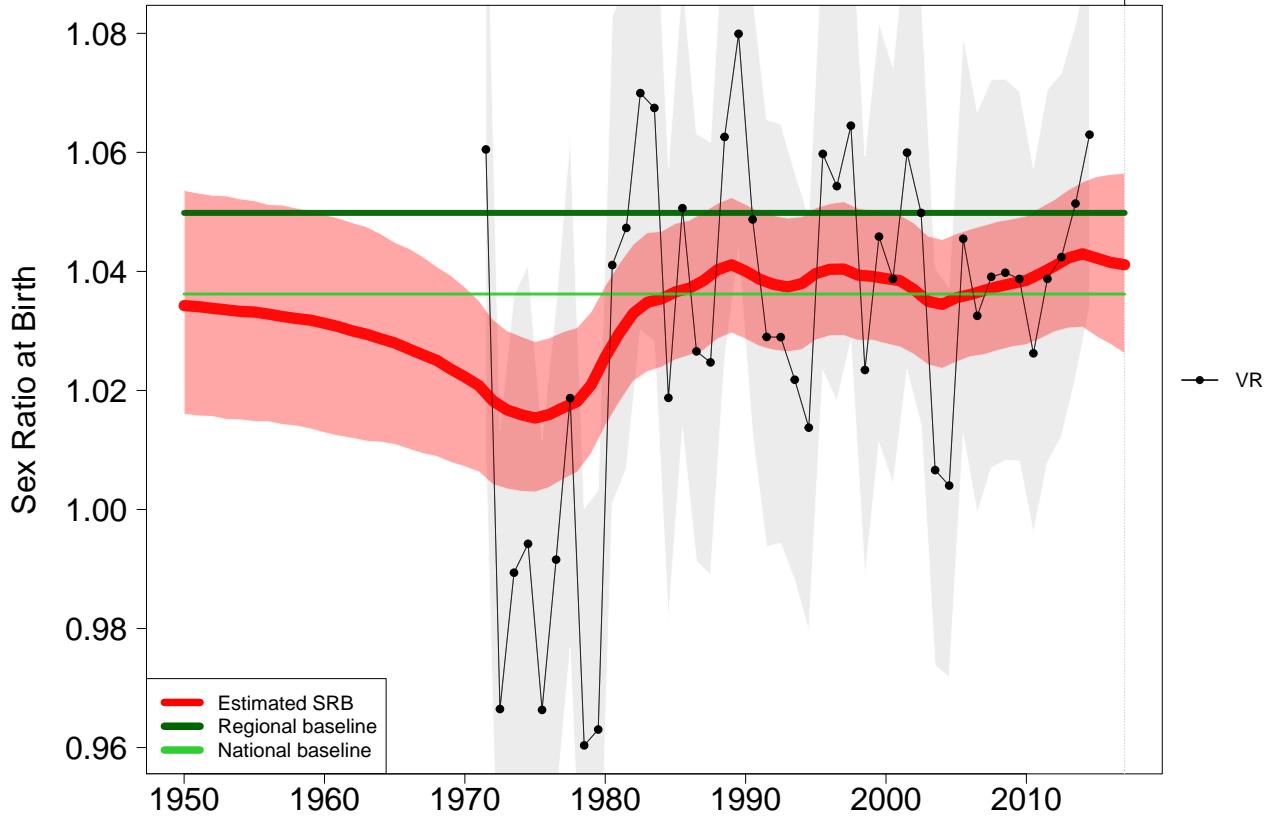
Bahamas

2017



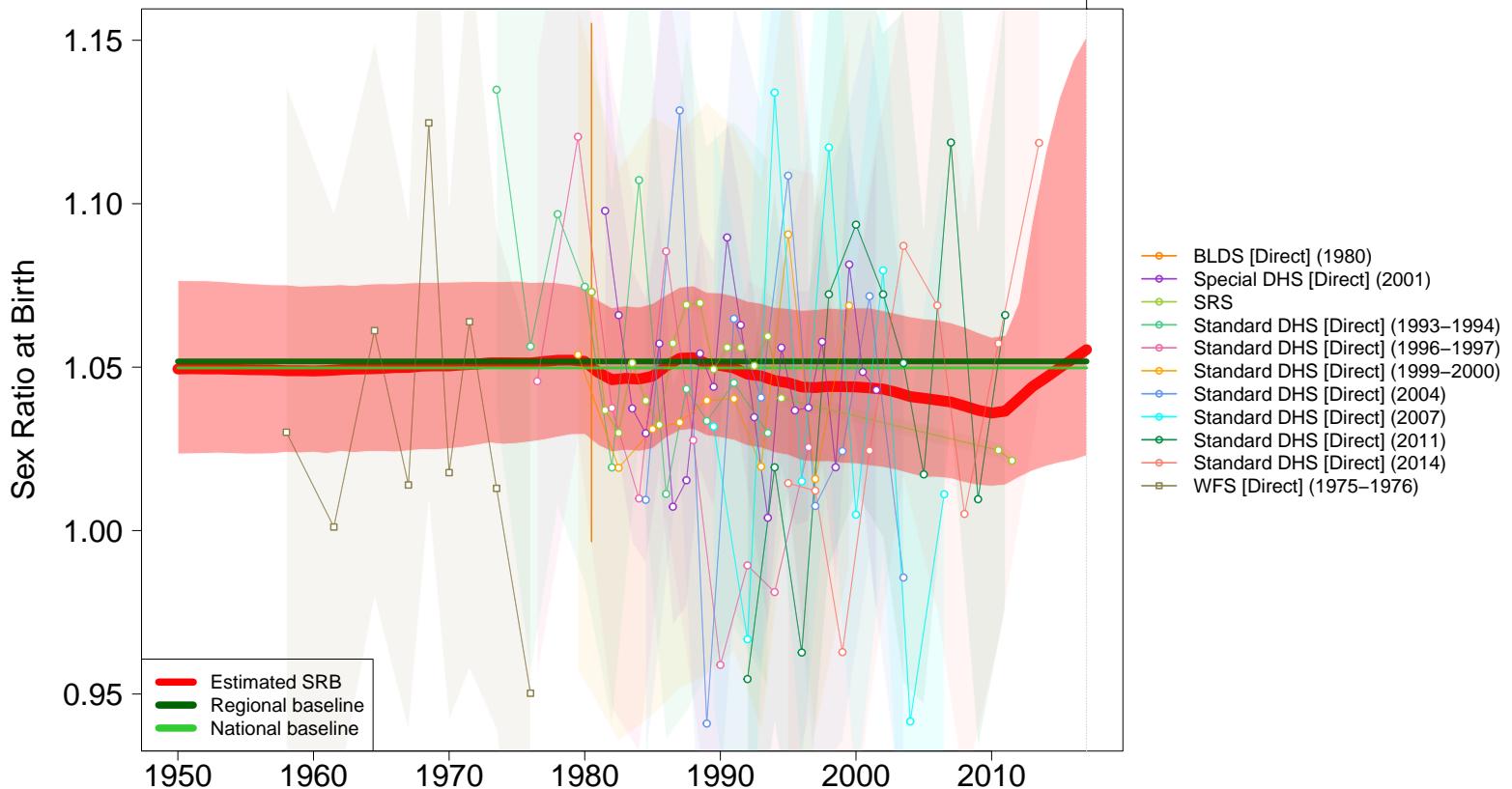
Bahrain

2017



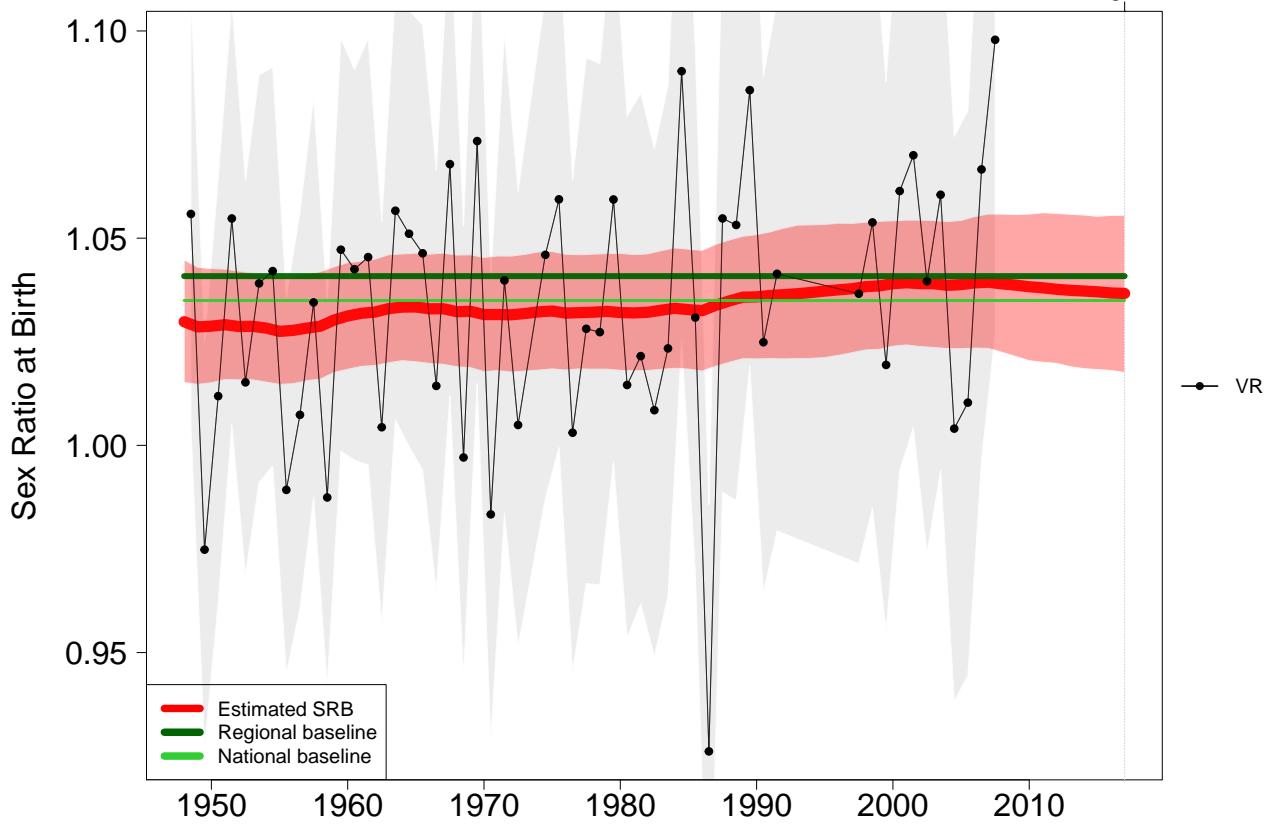
Bangladesh

2017



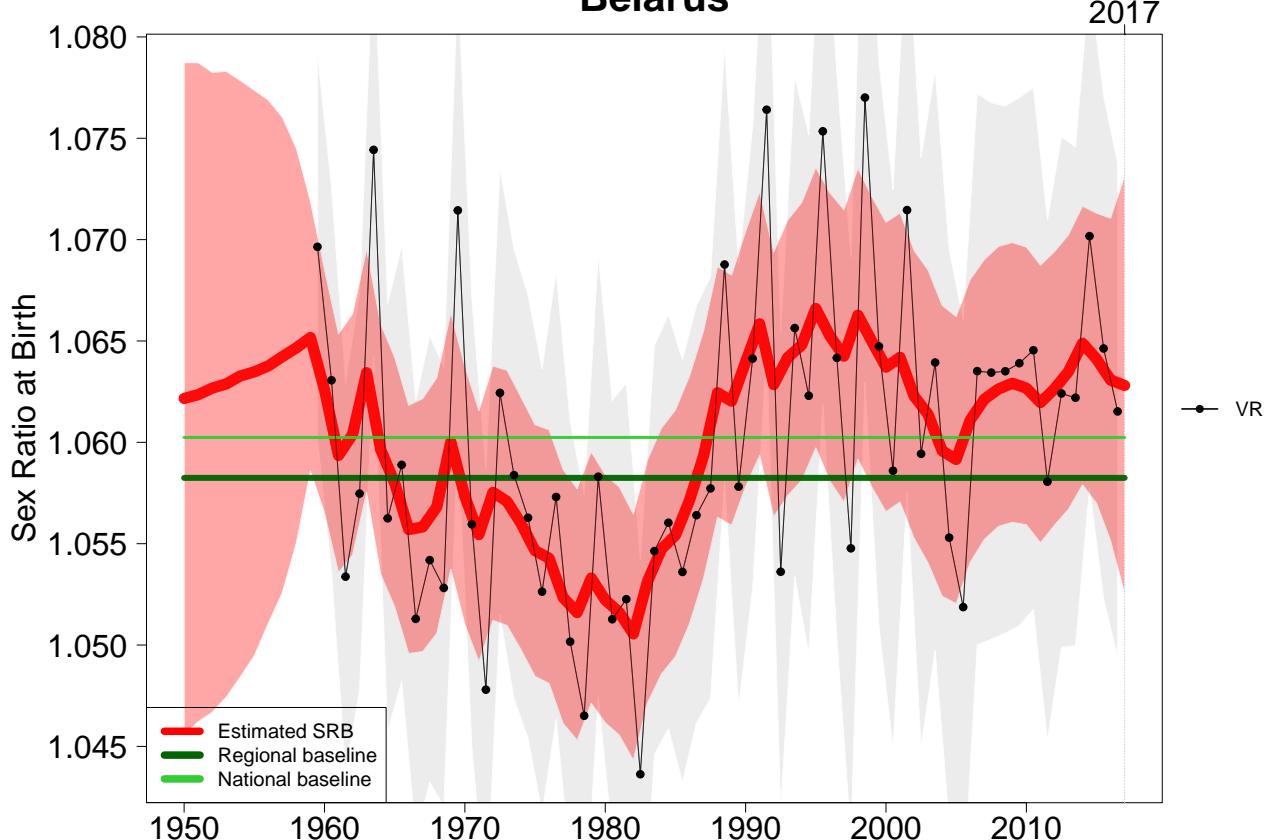
Barbados

2017



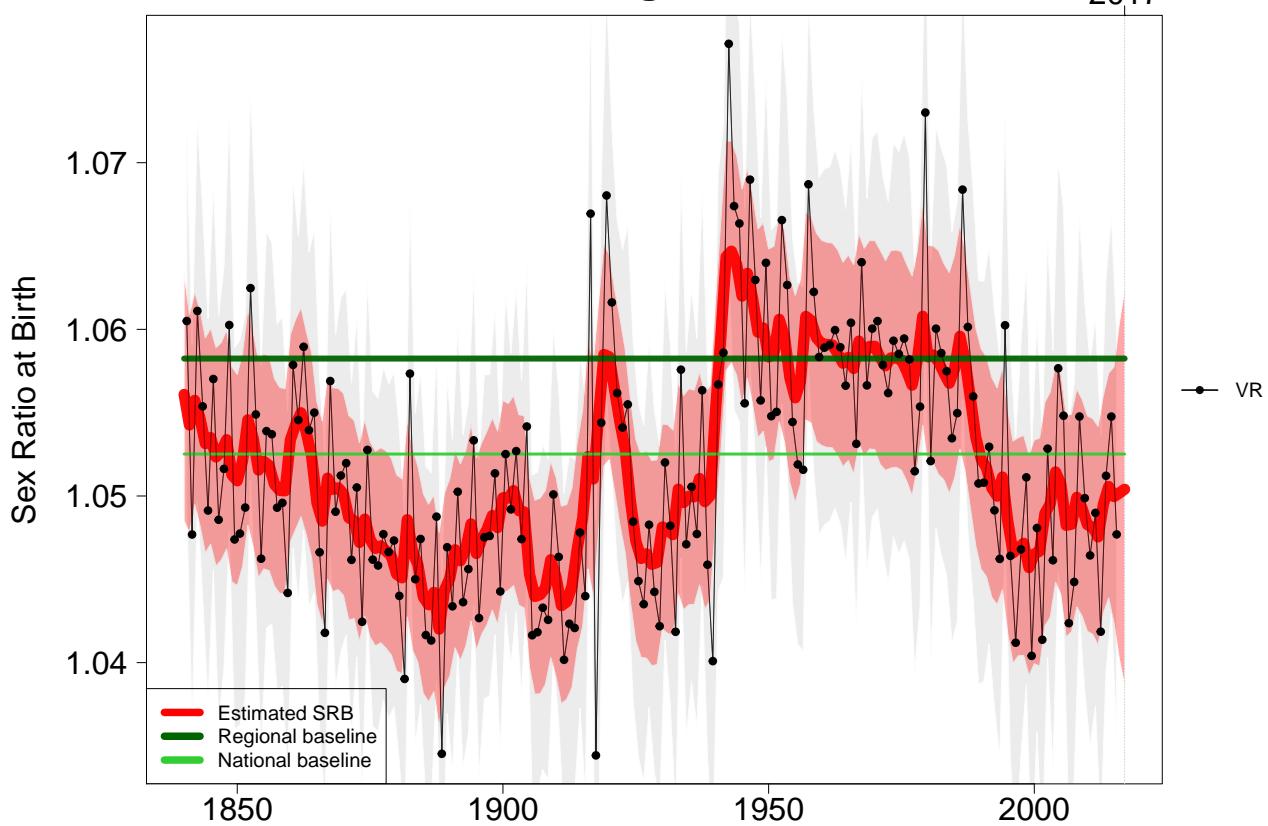
Belarus

2017



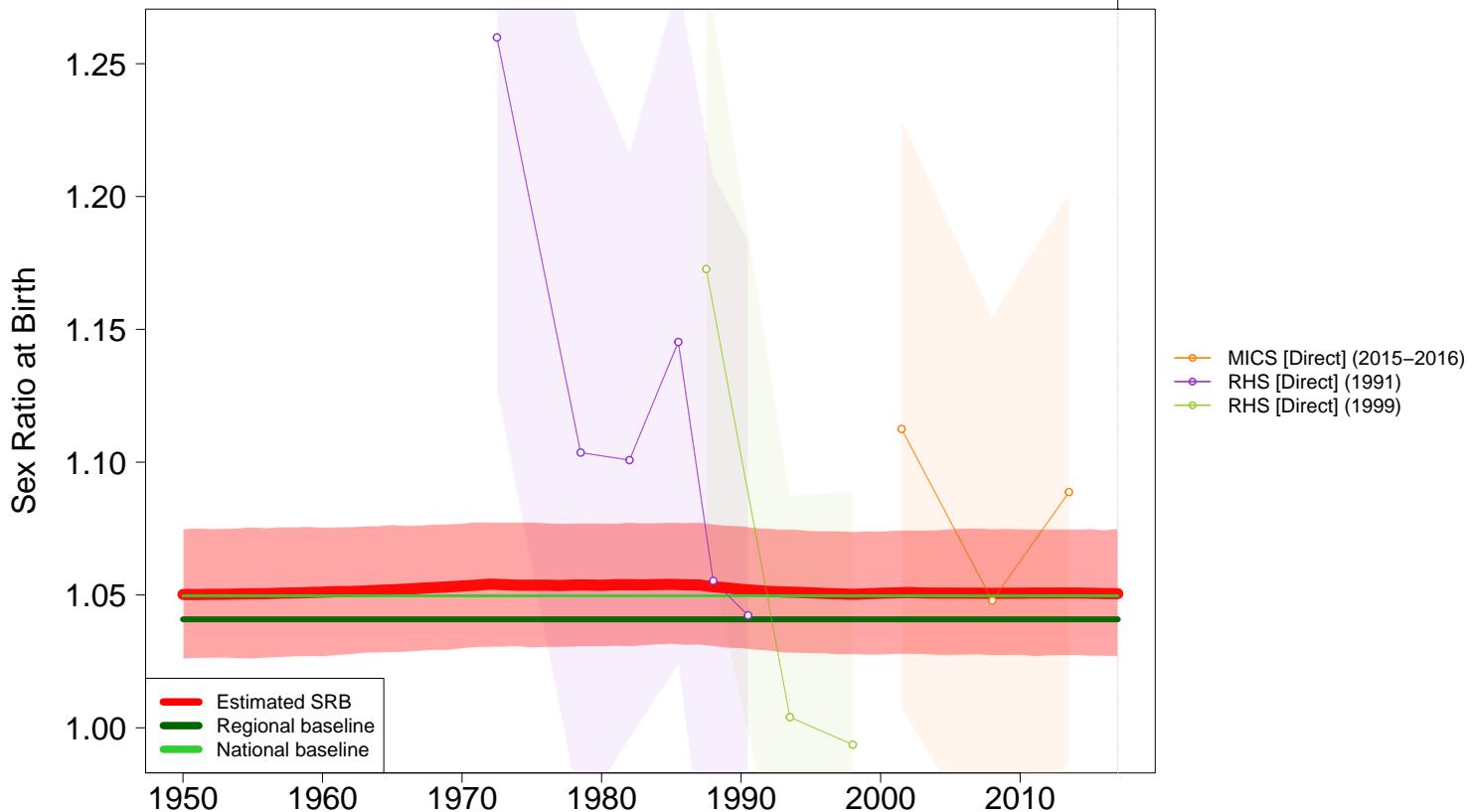
Belgium

2017



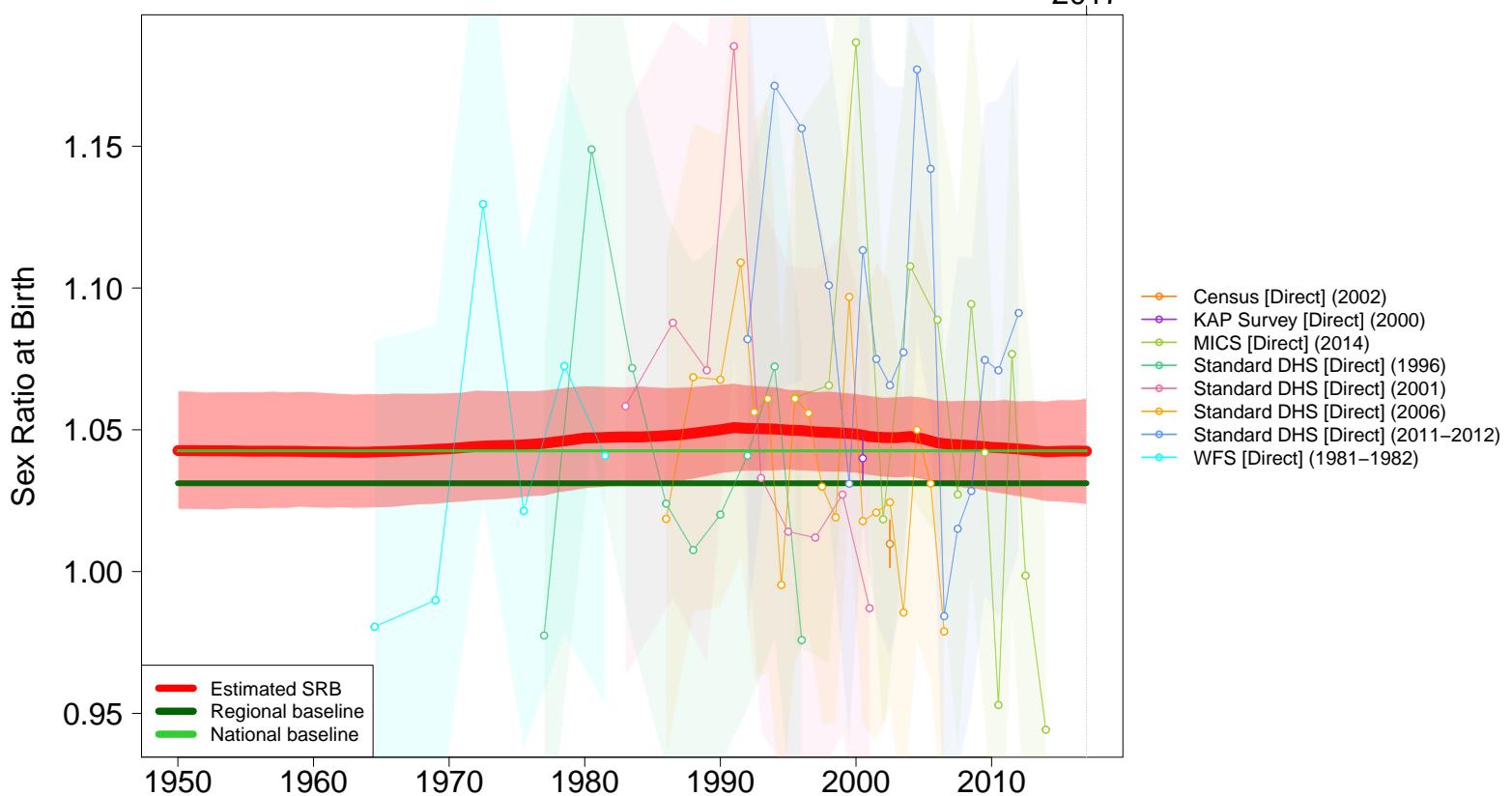
Belize

2017



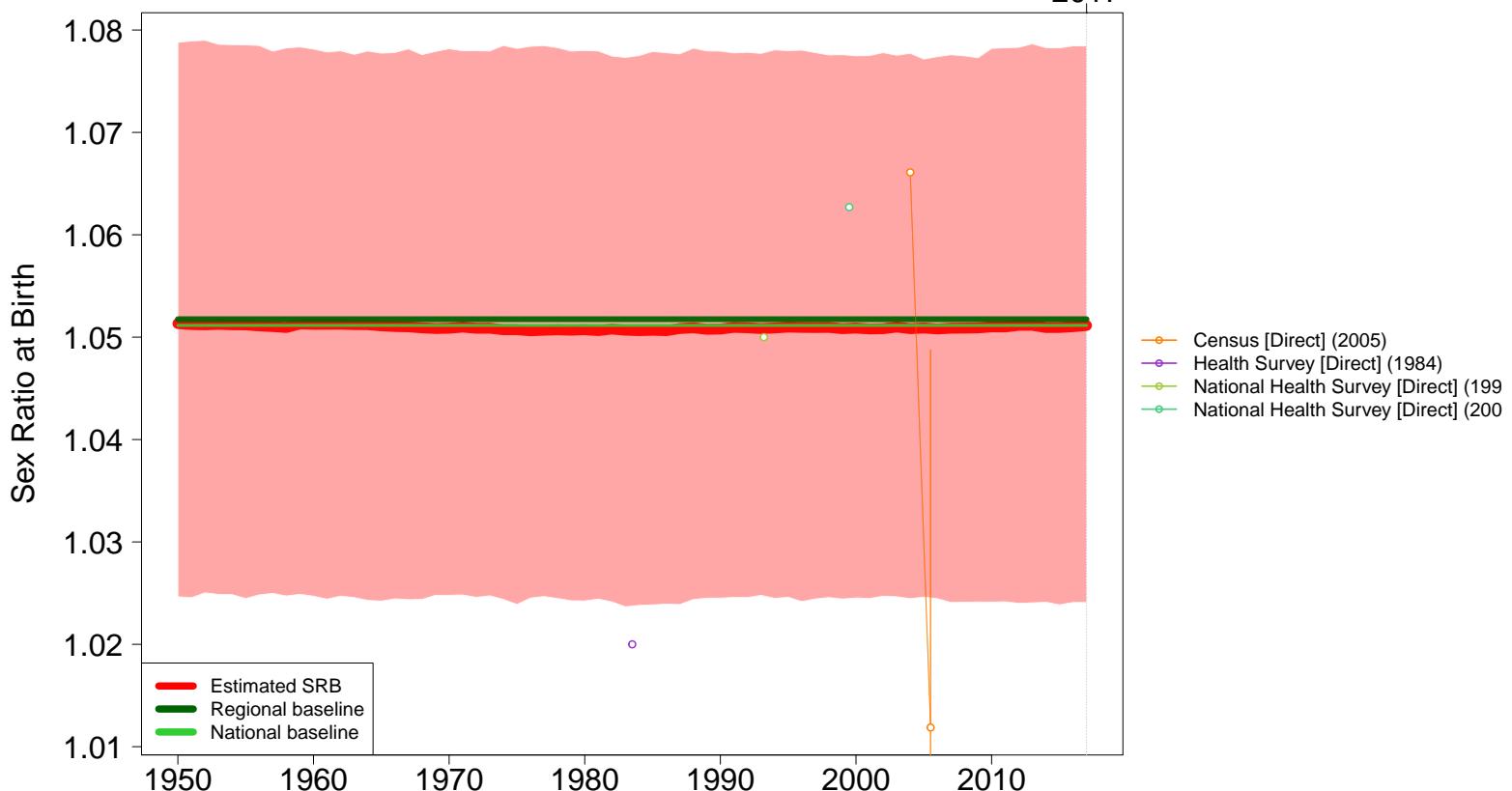
Benin

2017



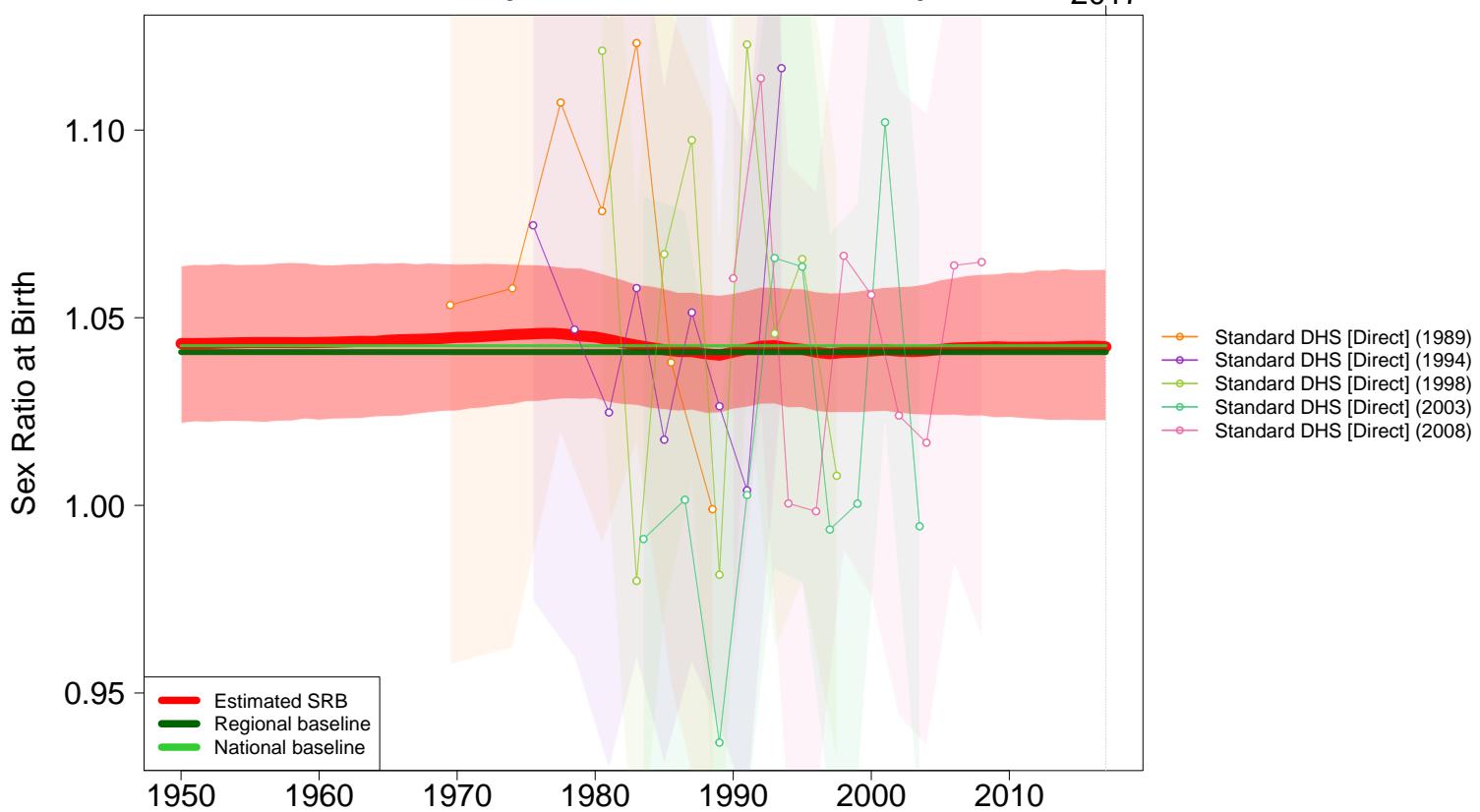
Bhutan

2017



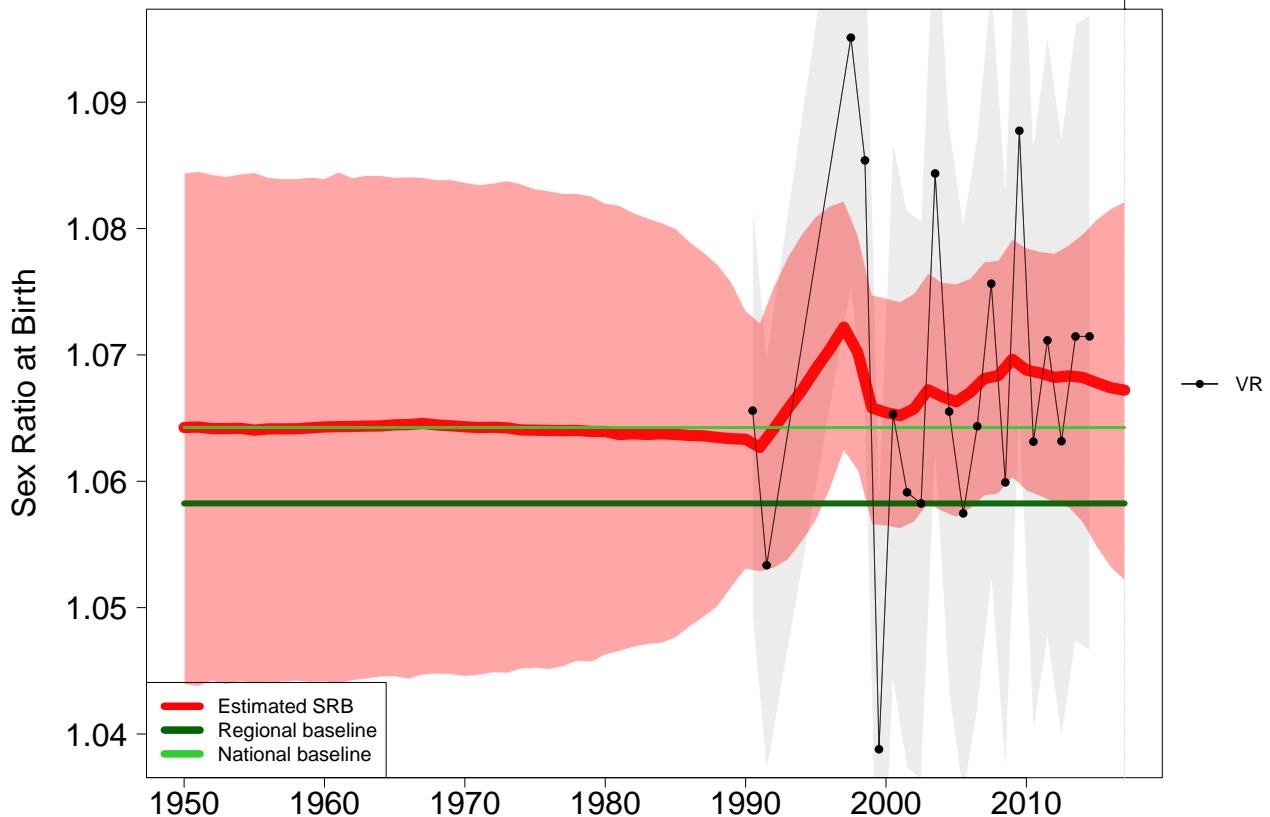
Bolivia (Plurinational State of)

2017



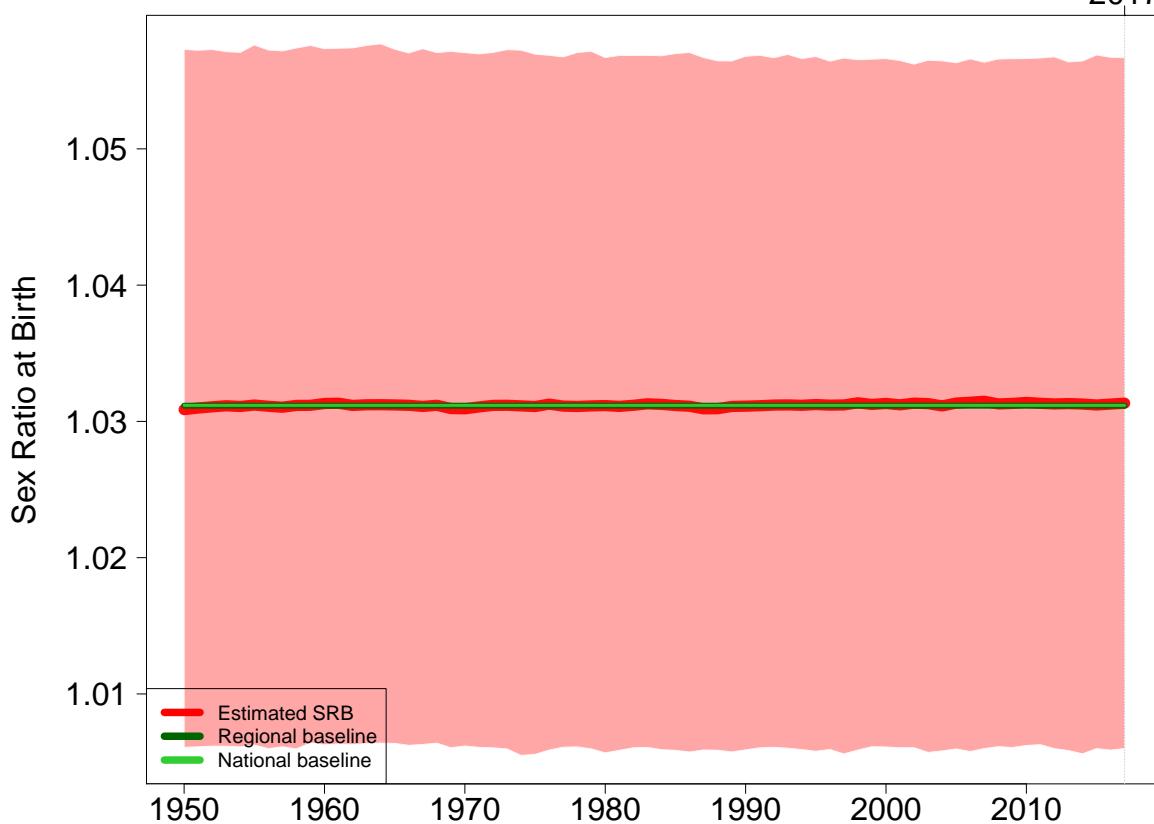
Bosnia and Herzegovina

2017



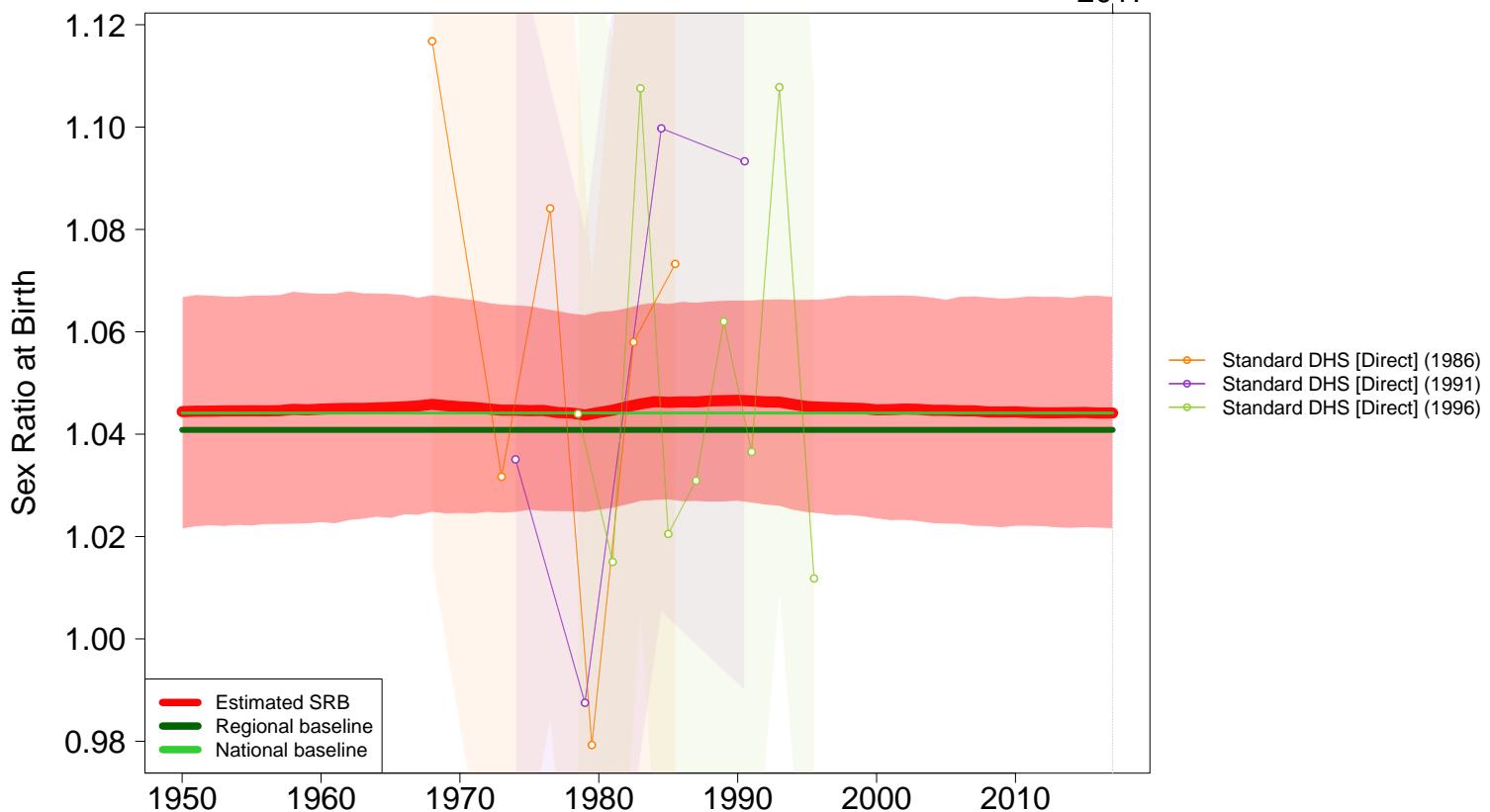
Botswana

2017



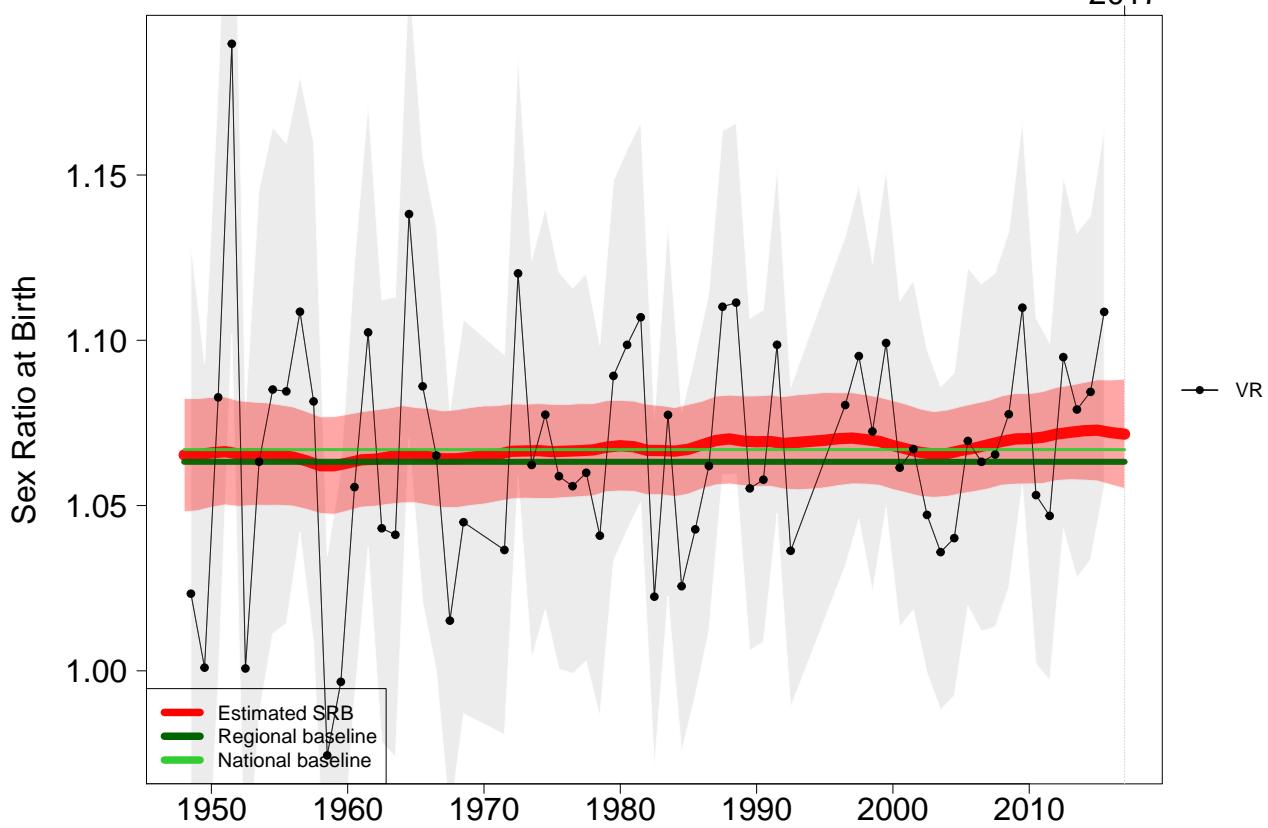
Brazil

2017



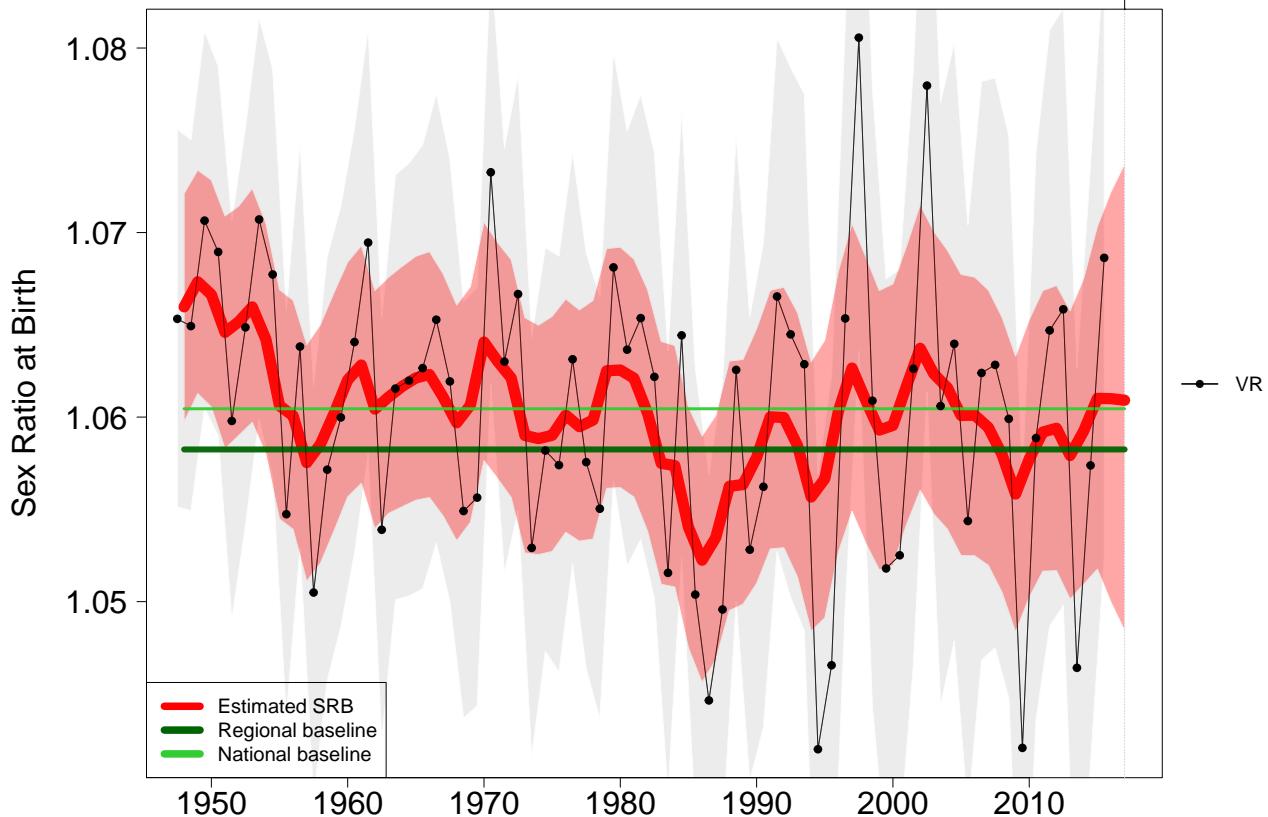
Brunei

2017



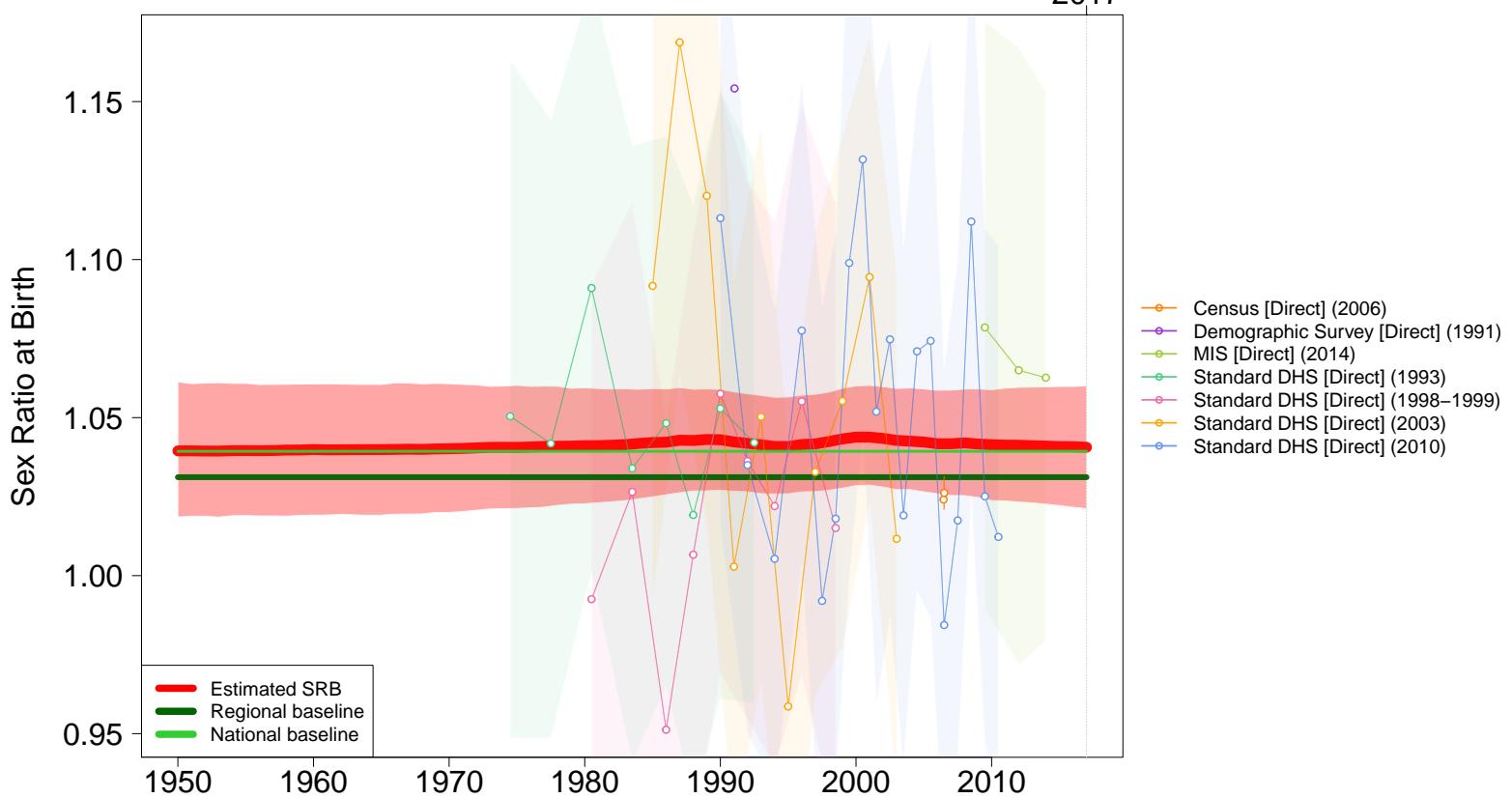
Bulgaria

2017



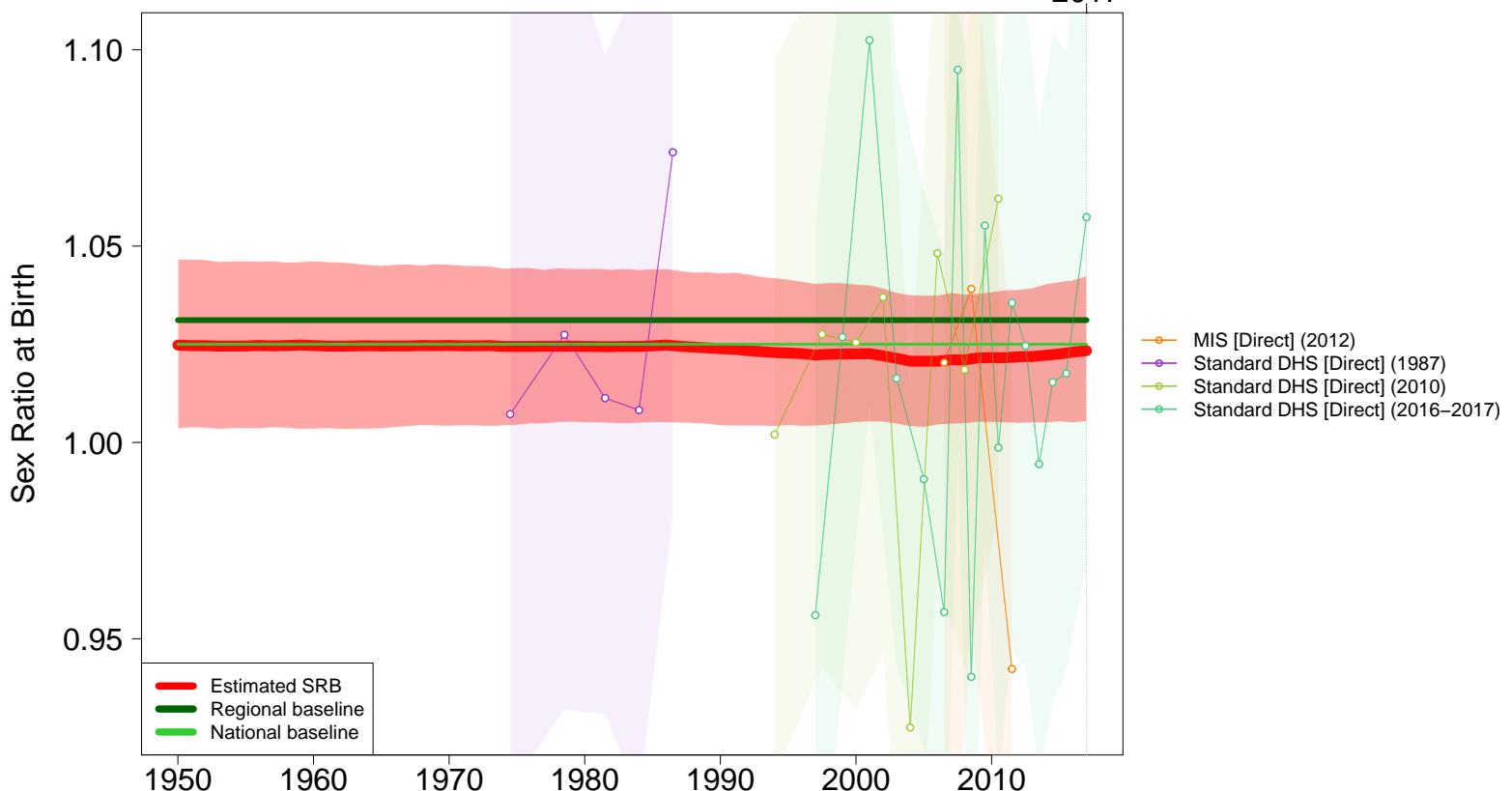
Burkina Faso

2017



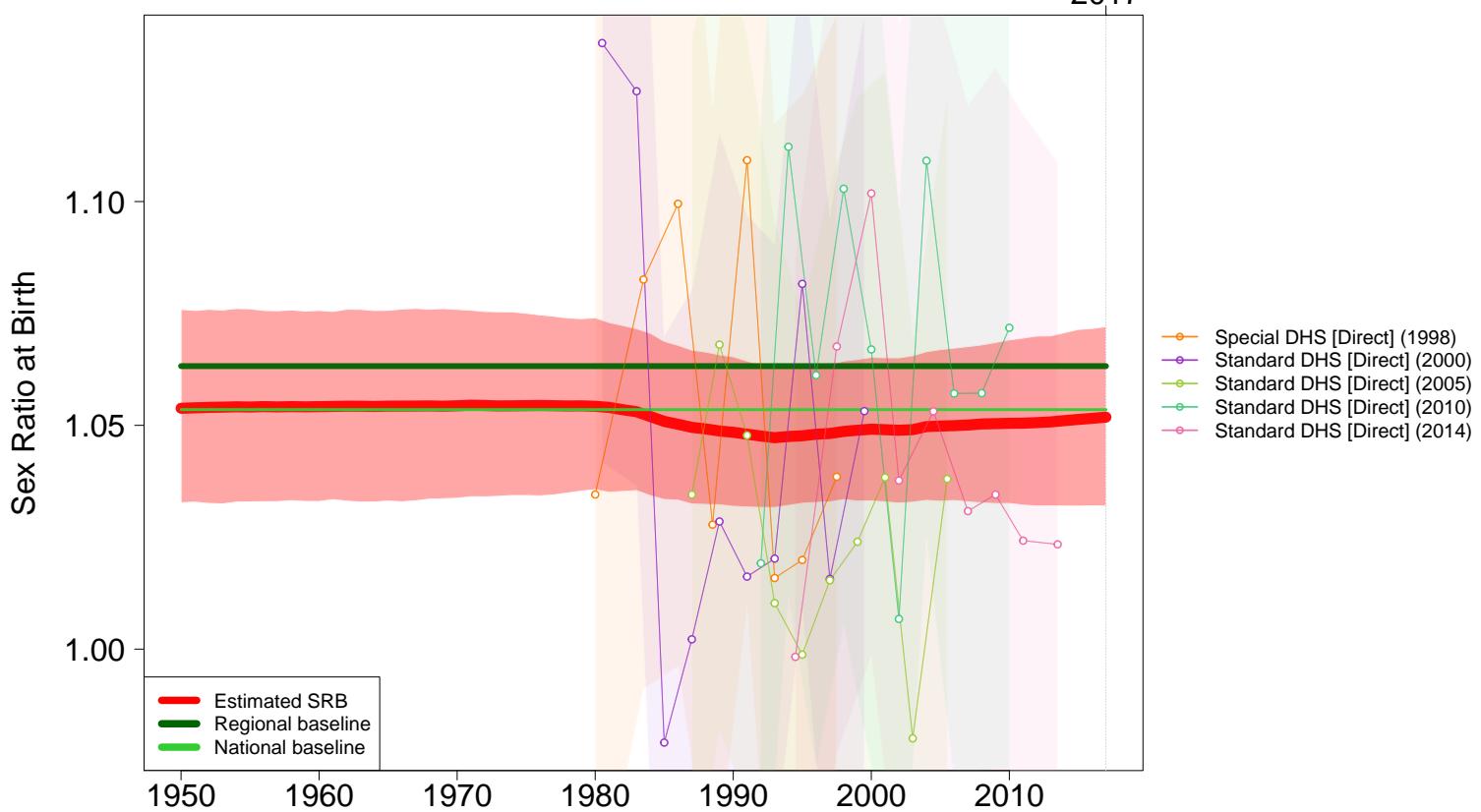
Burundi

2017



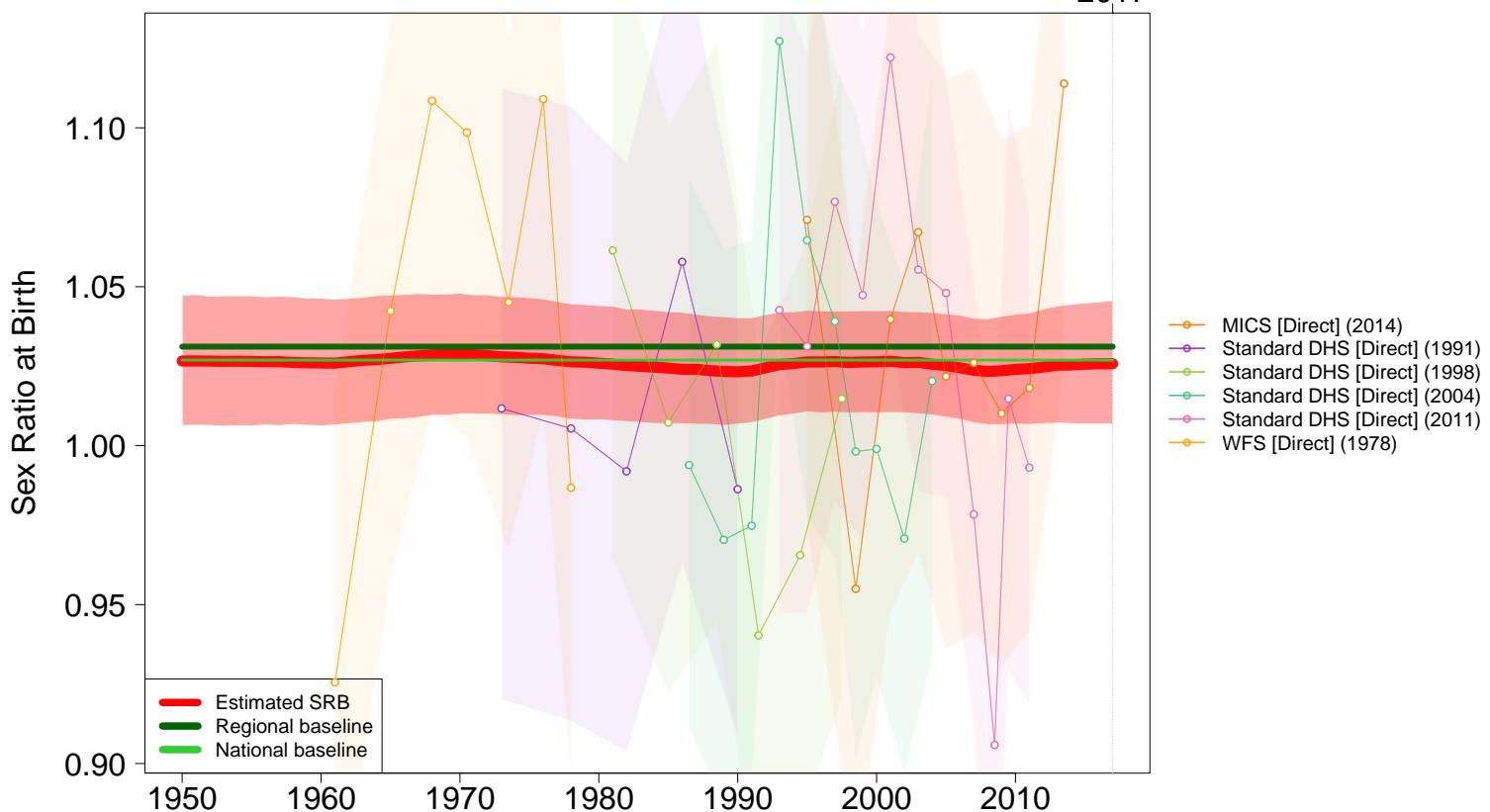
Cambodia

2017



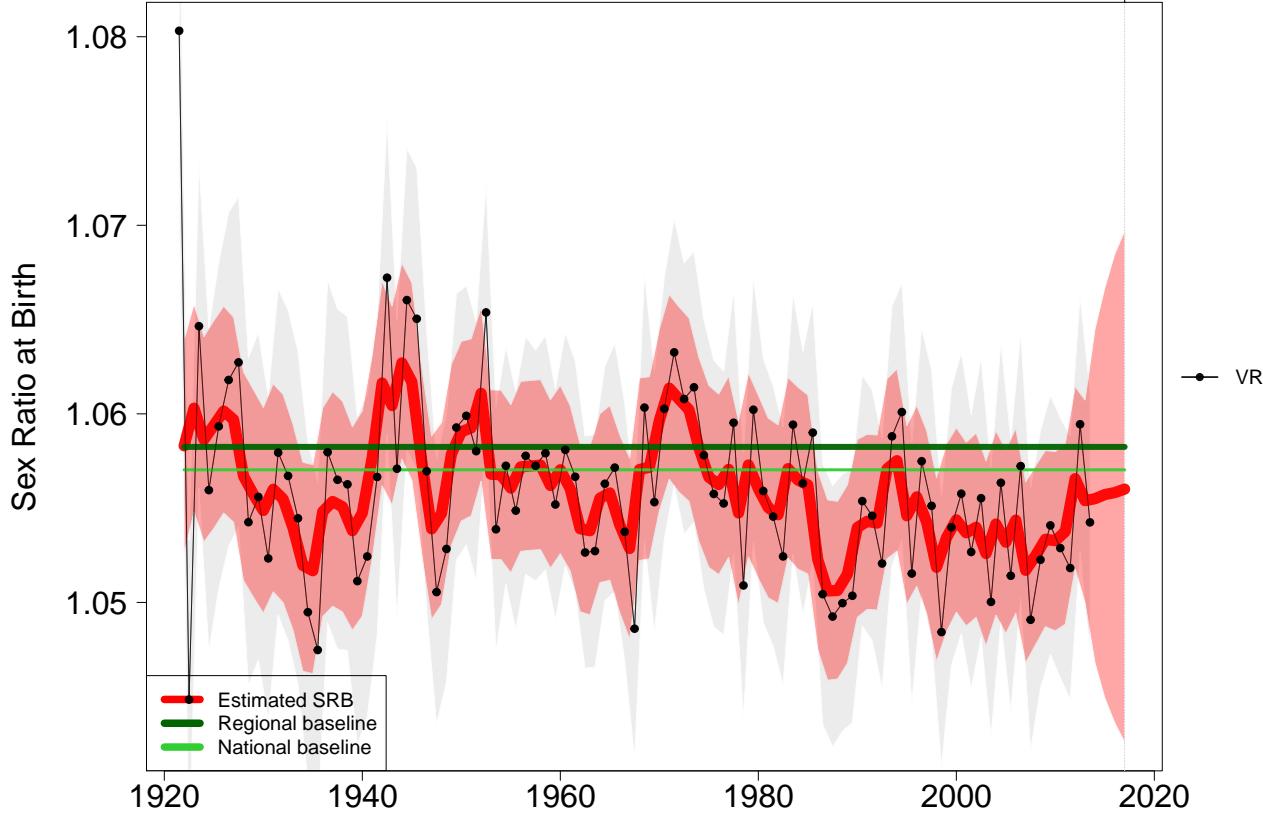
Cameroon

2017



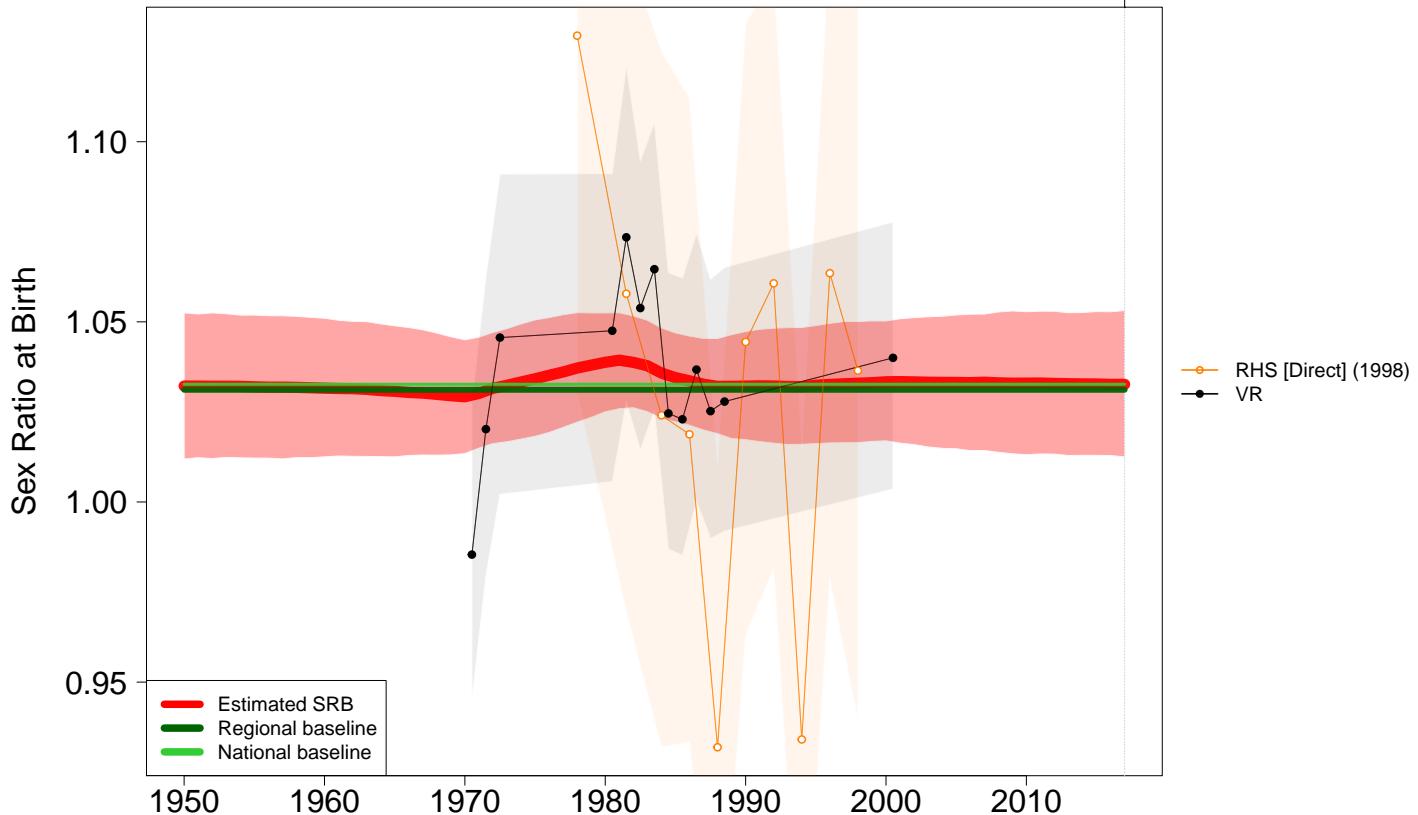
Canada

2017



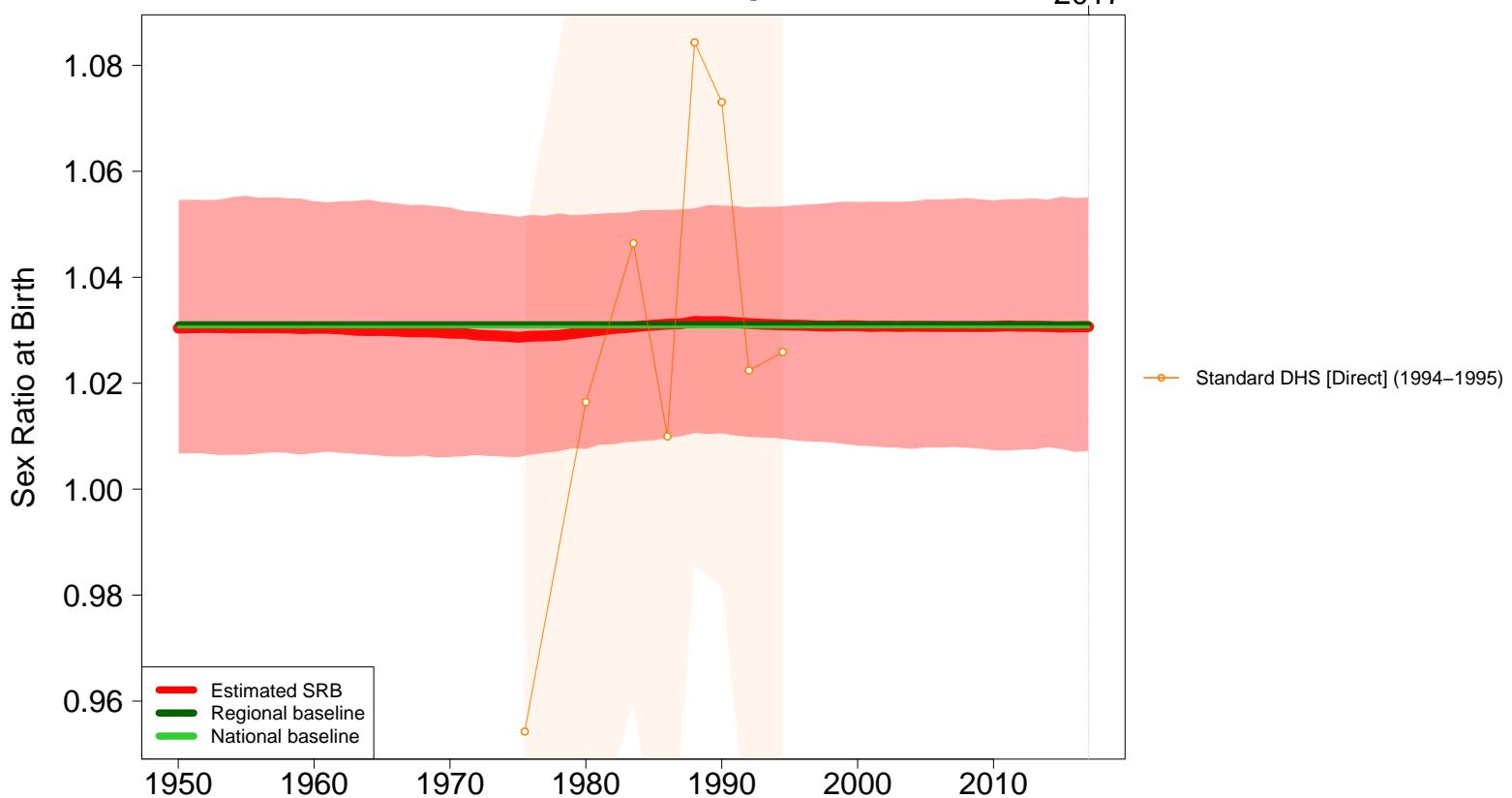
Cape Verde

2017



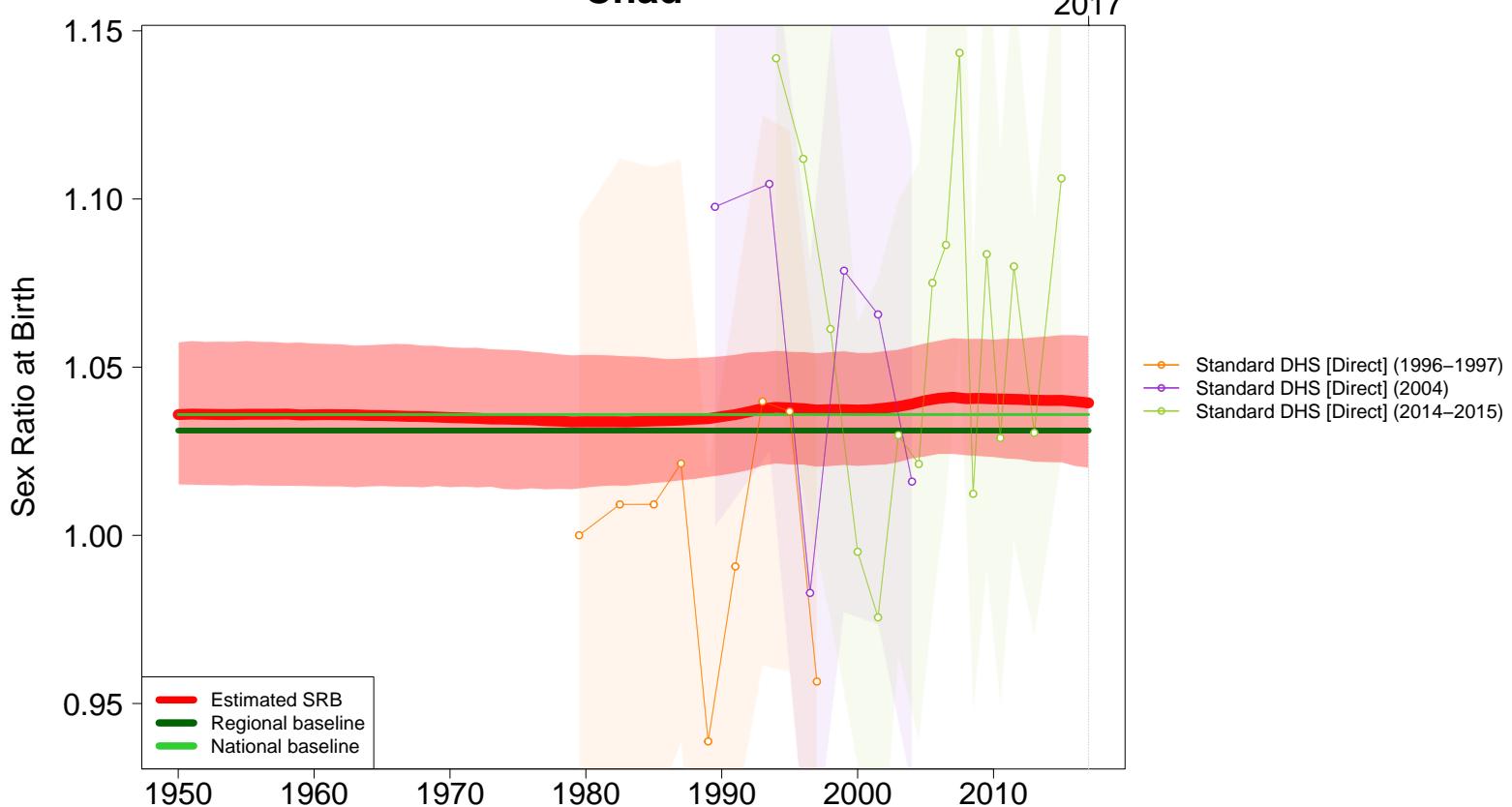
Central African Republic

2017



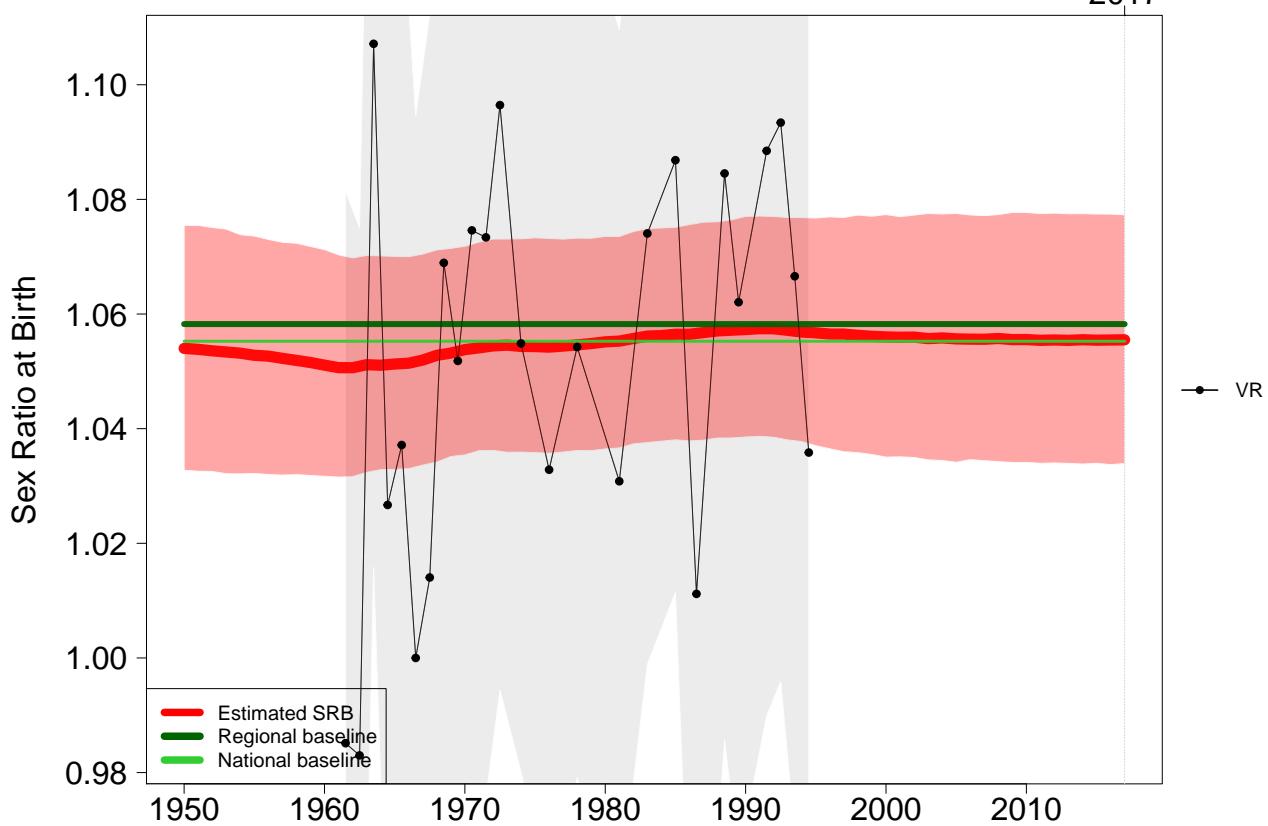
Chad

2017



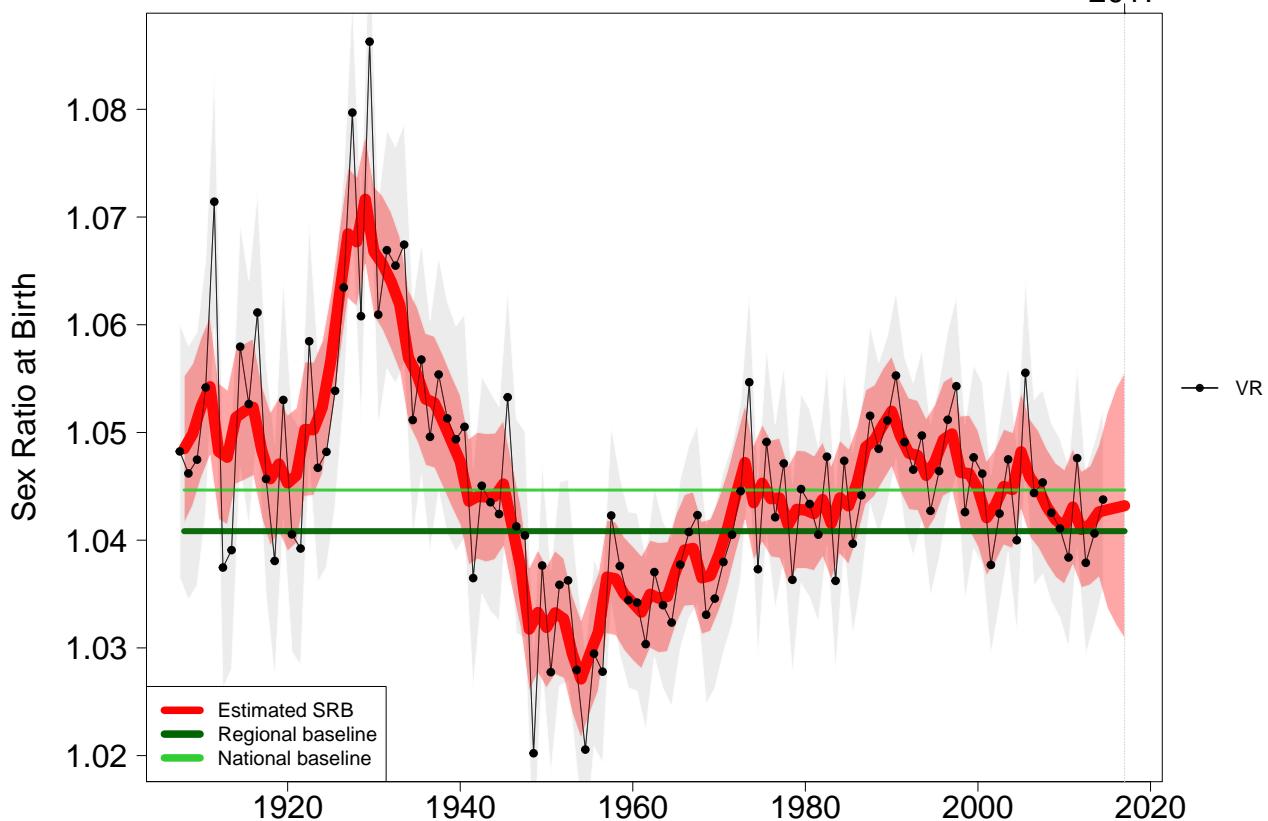
Channel Islands

2017



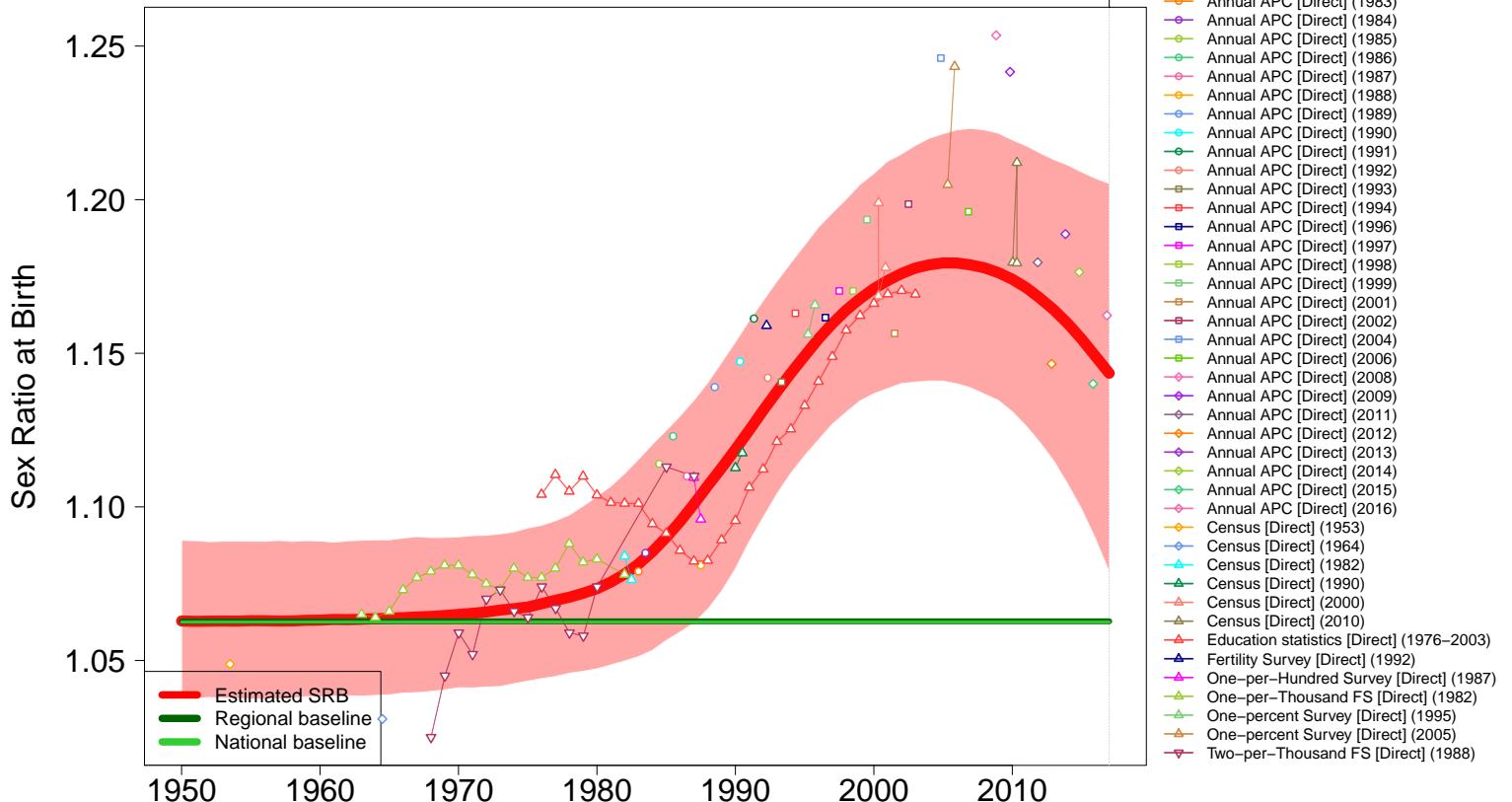
Chile

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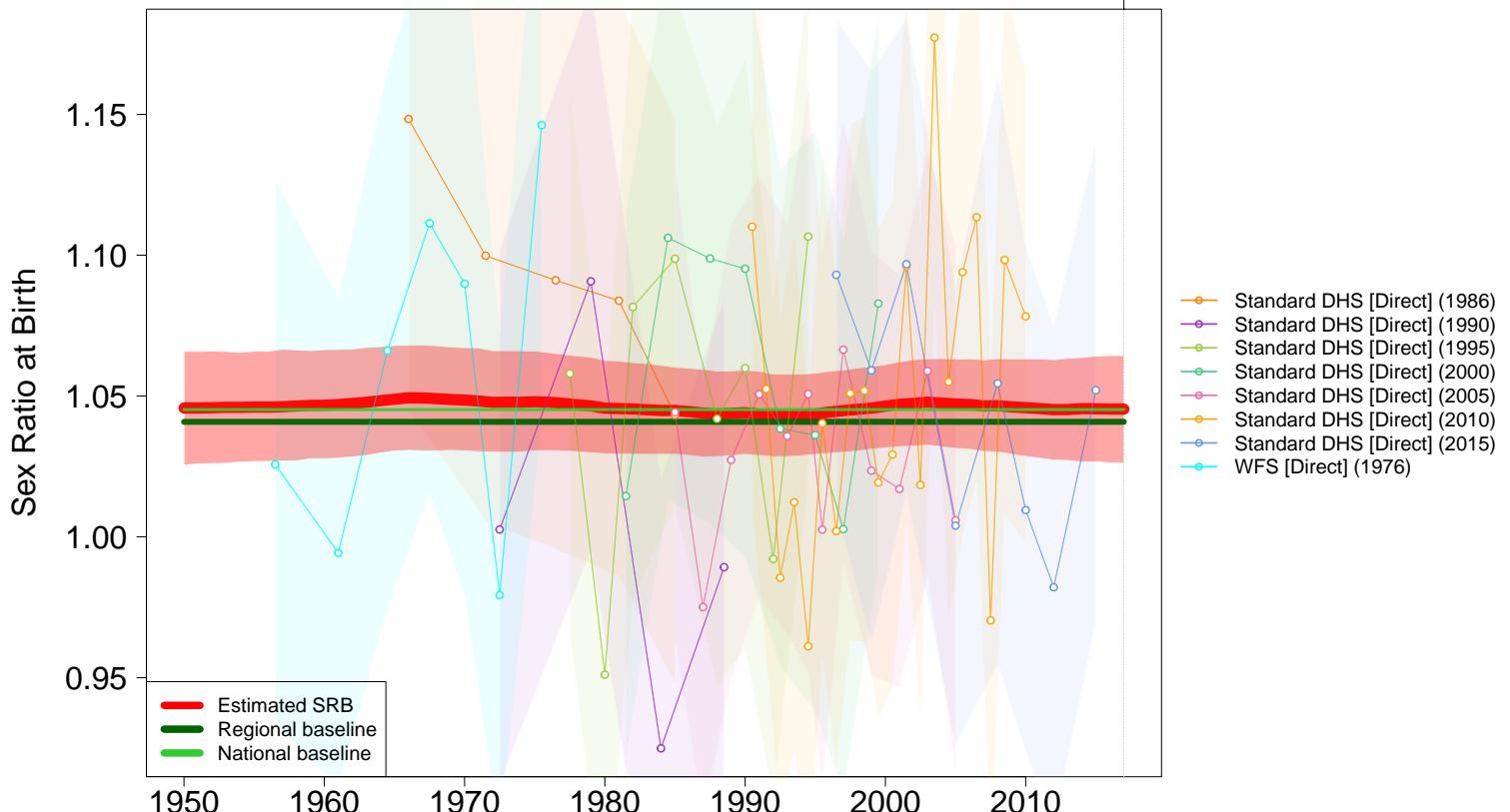
China

2017



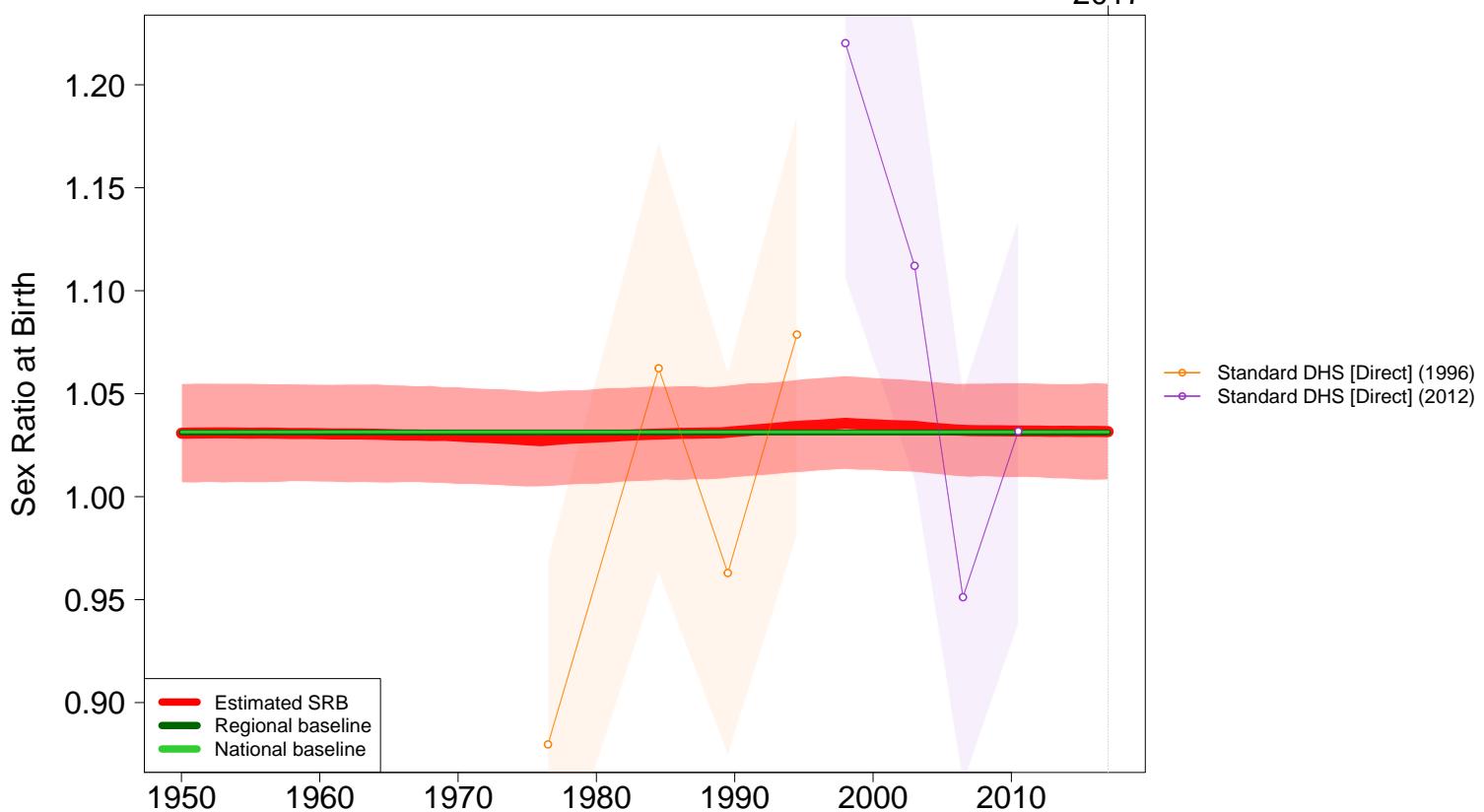
Colombia

2017



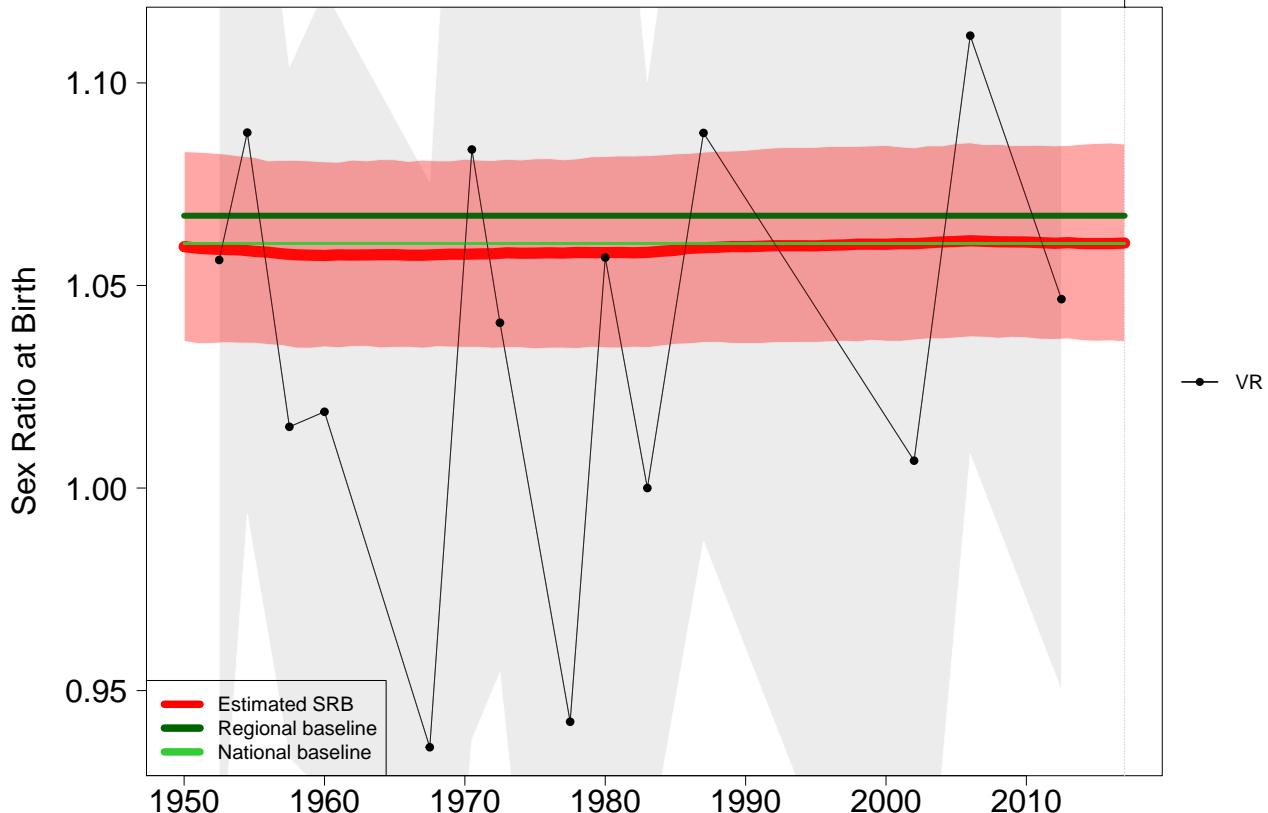
Comoros

2017



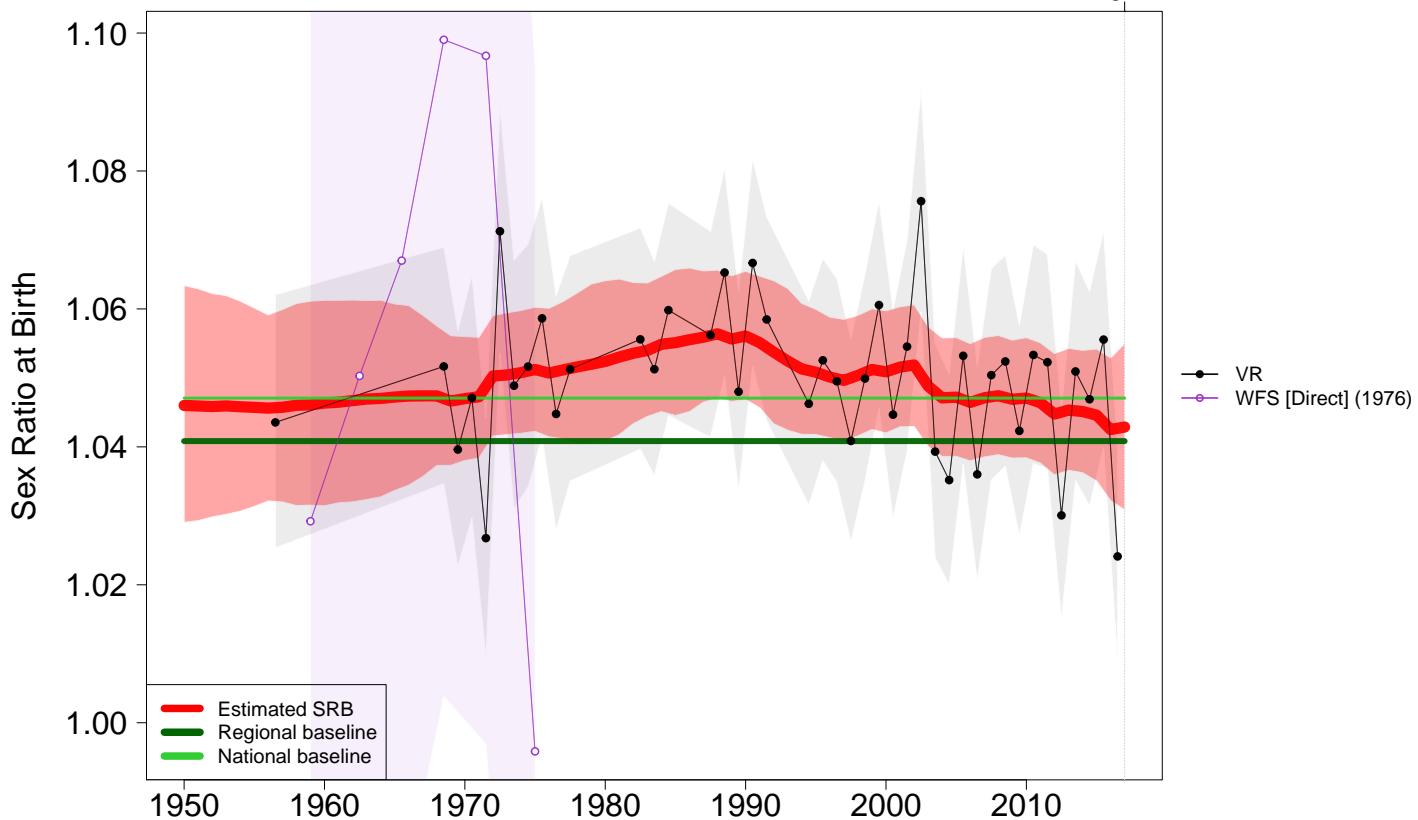
Cook Islands

2017



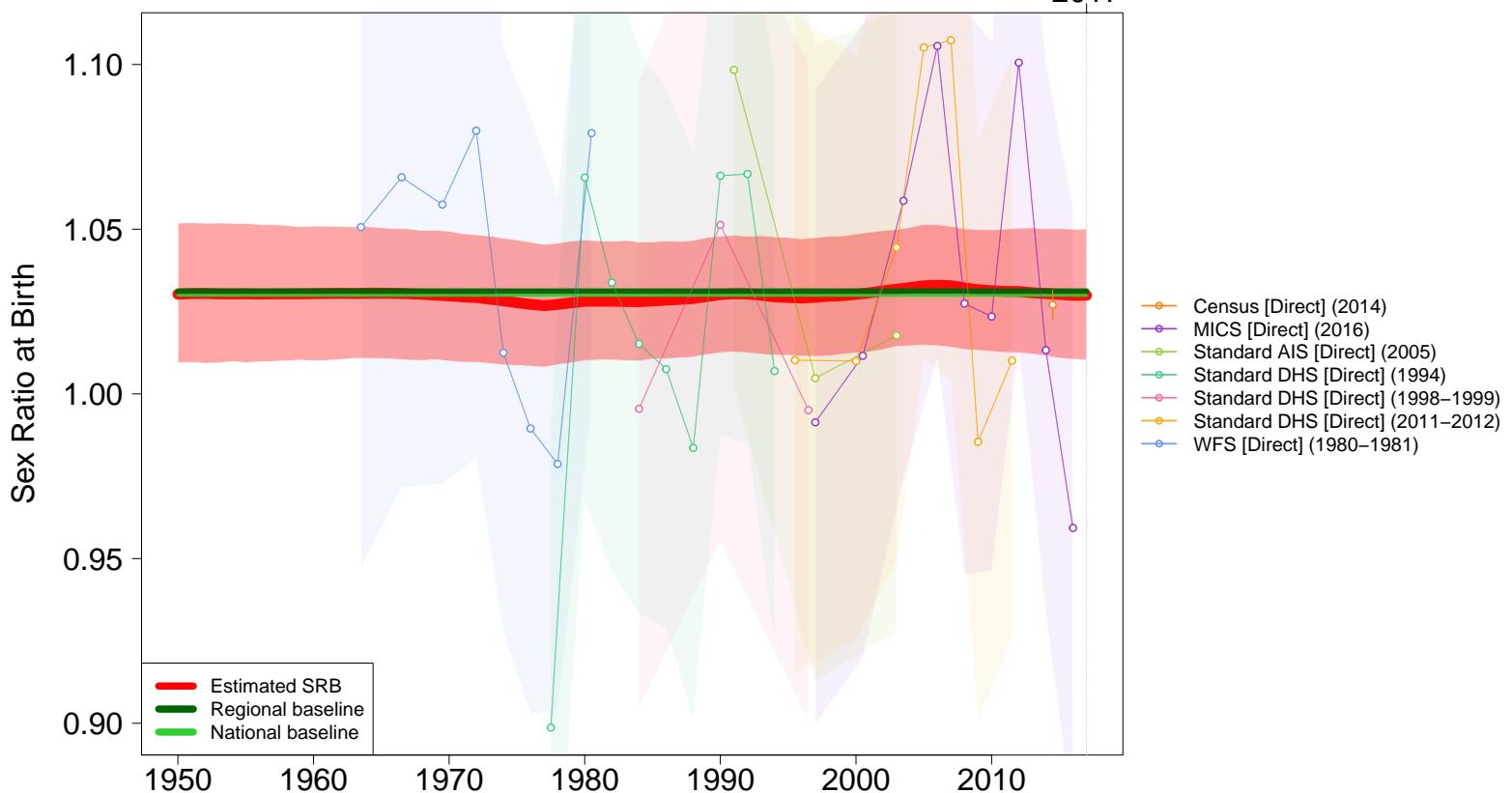
Costa Rica

2017



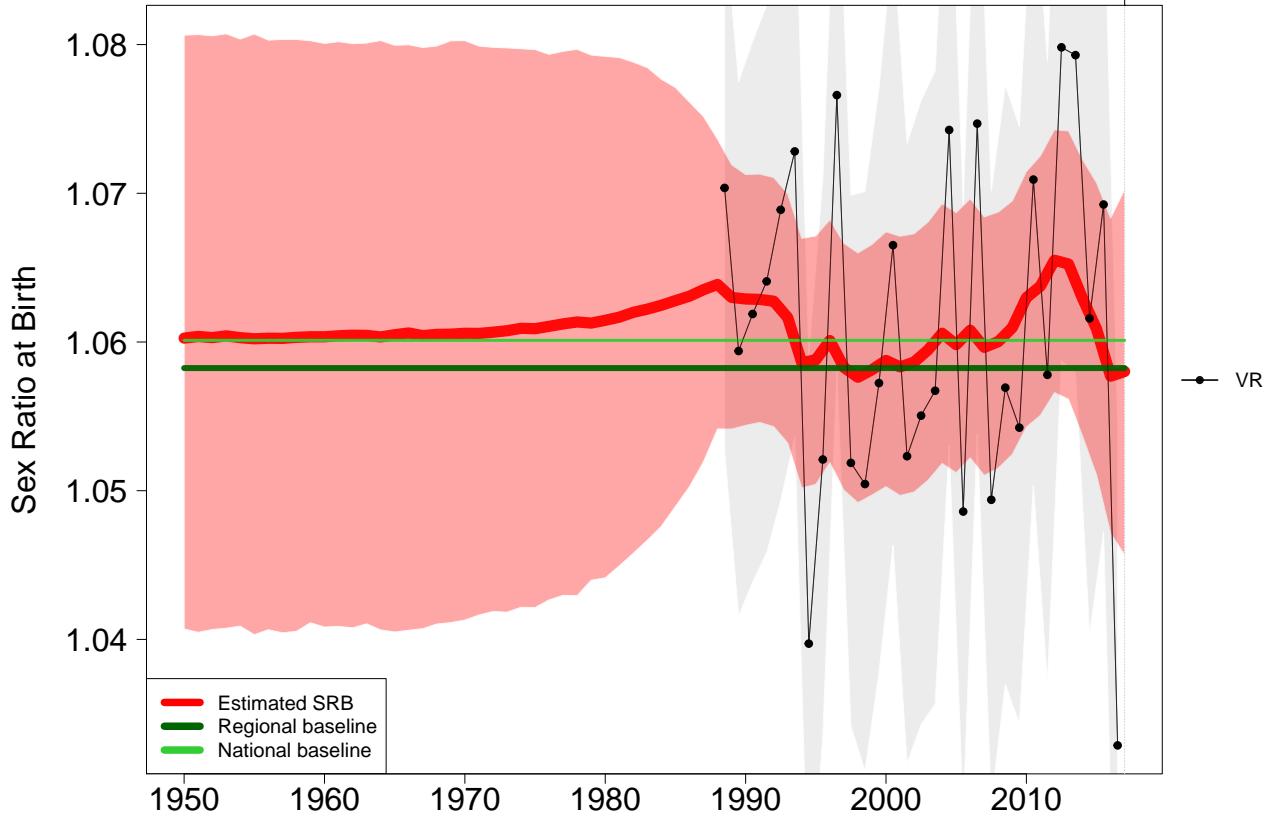
Cote d'Ivoire

2017



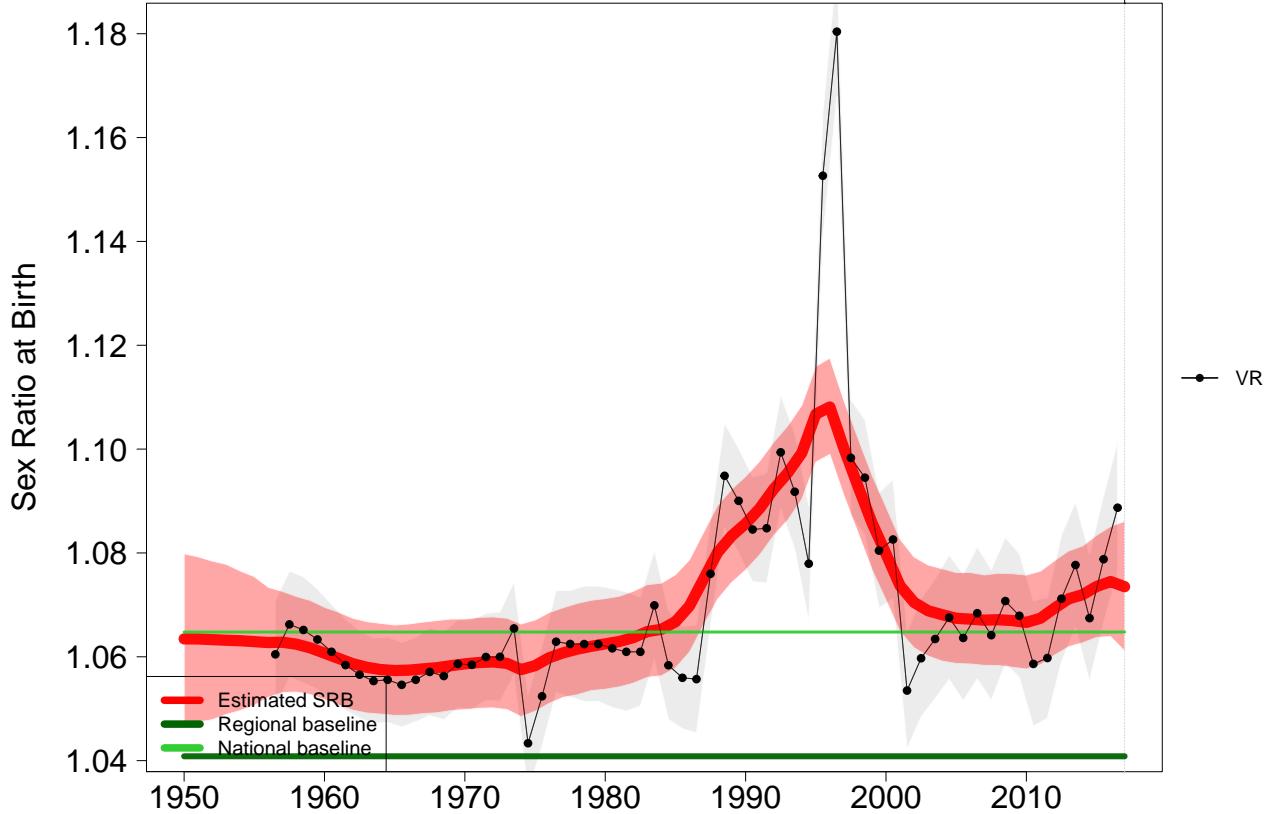
Croatia

2017



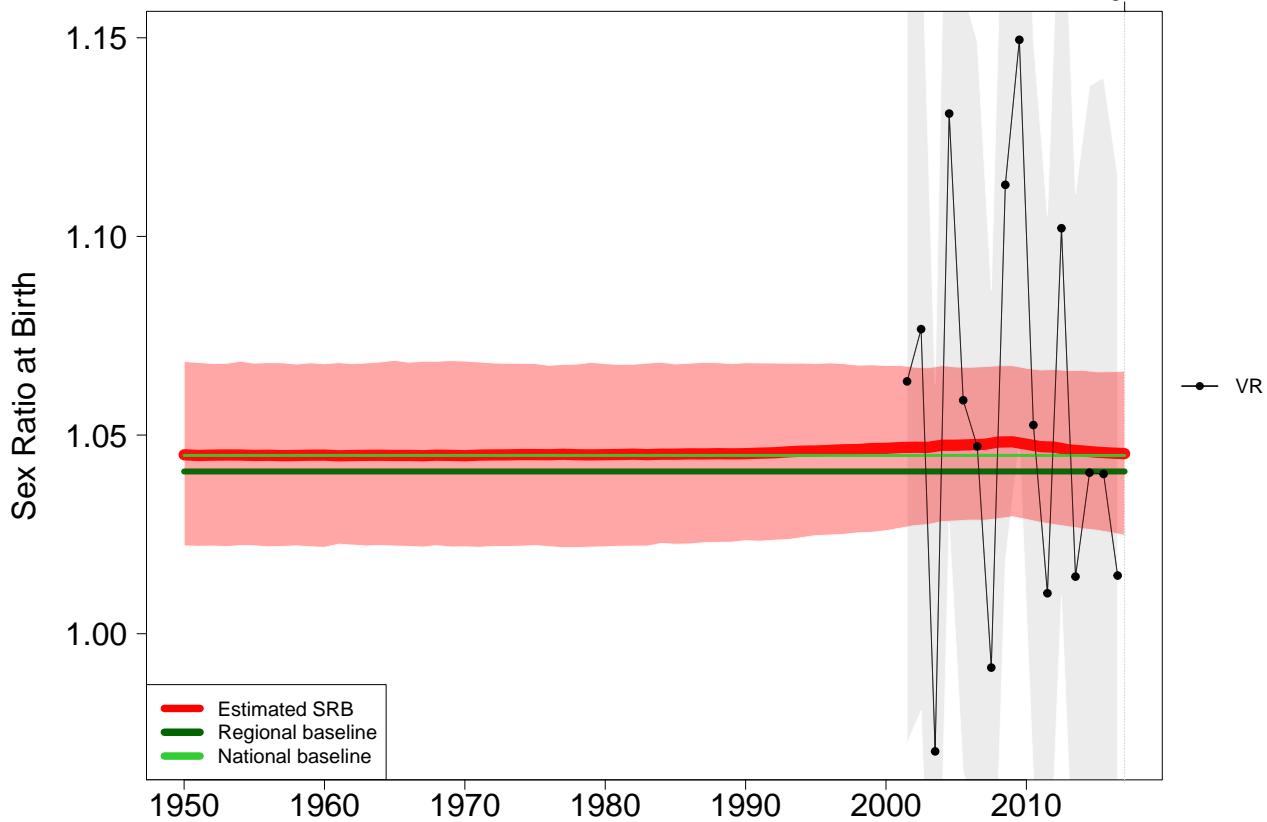
Cuba

2017



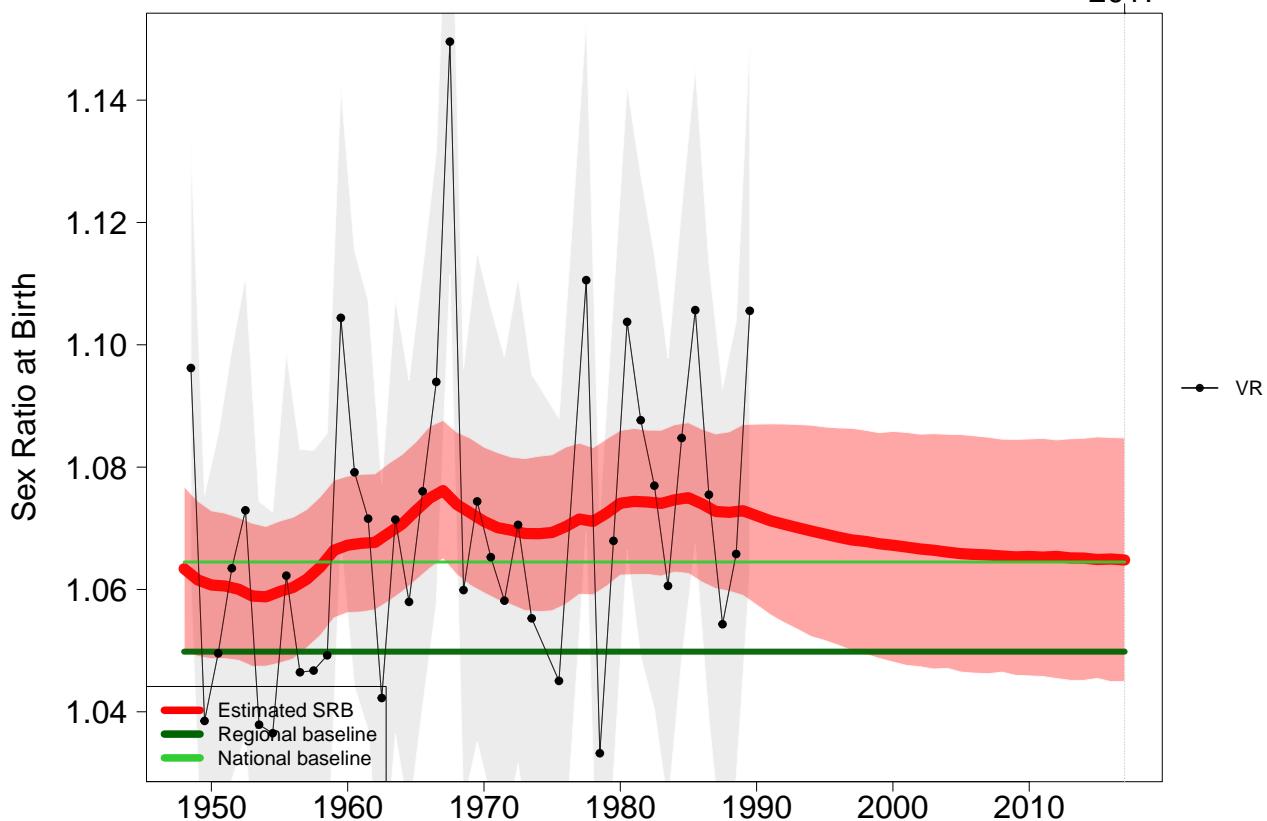
Curacao

2017



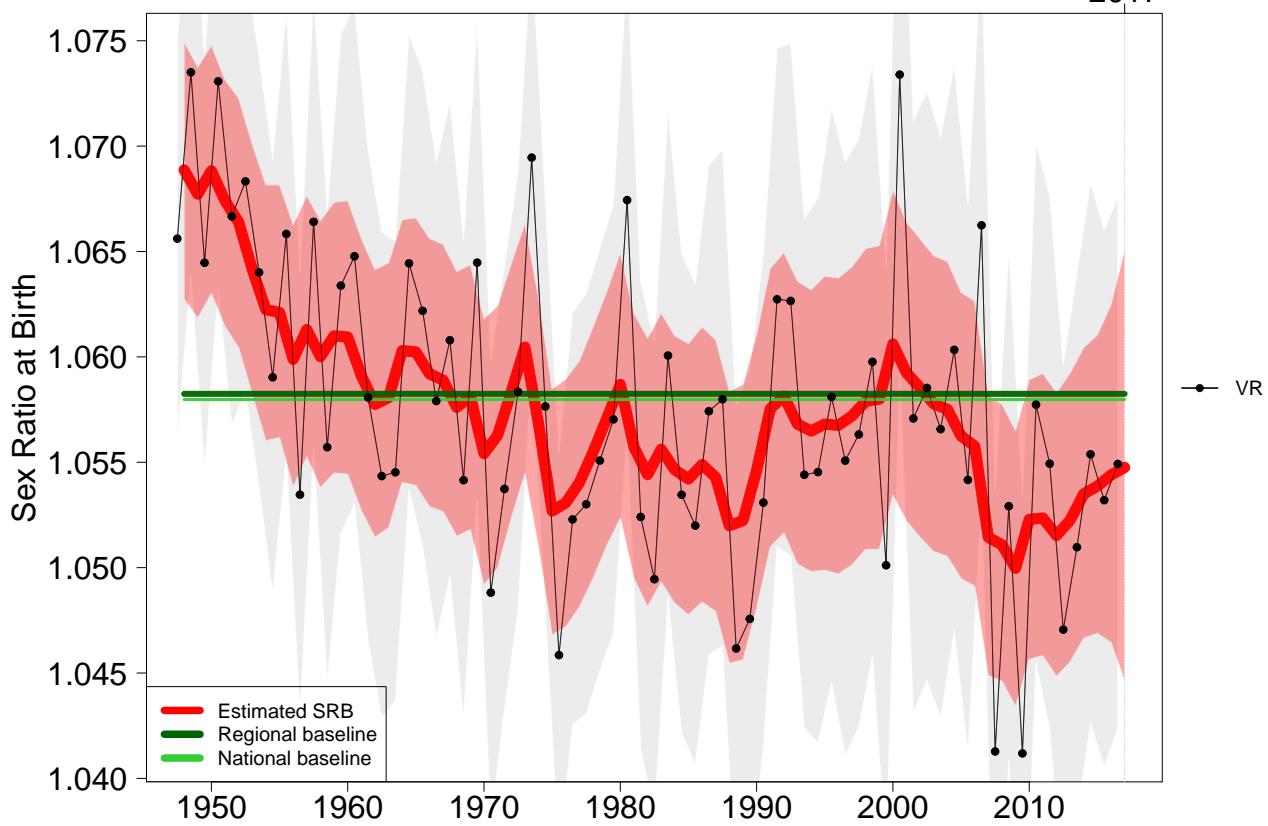
Cyprus

2017



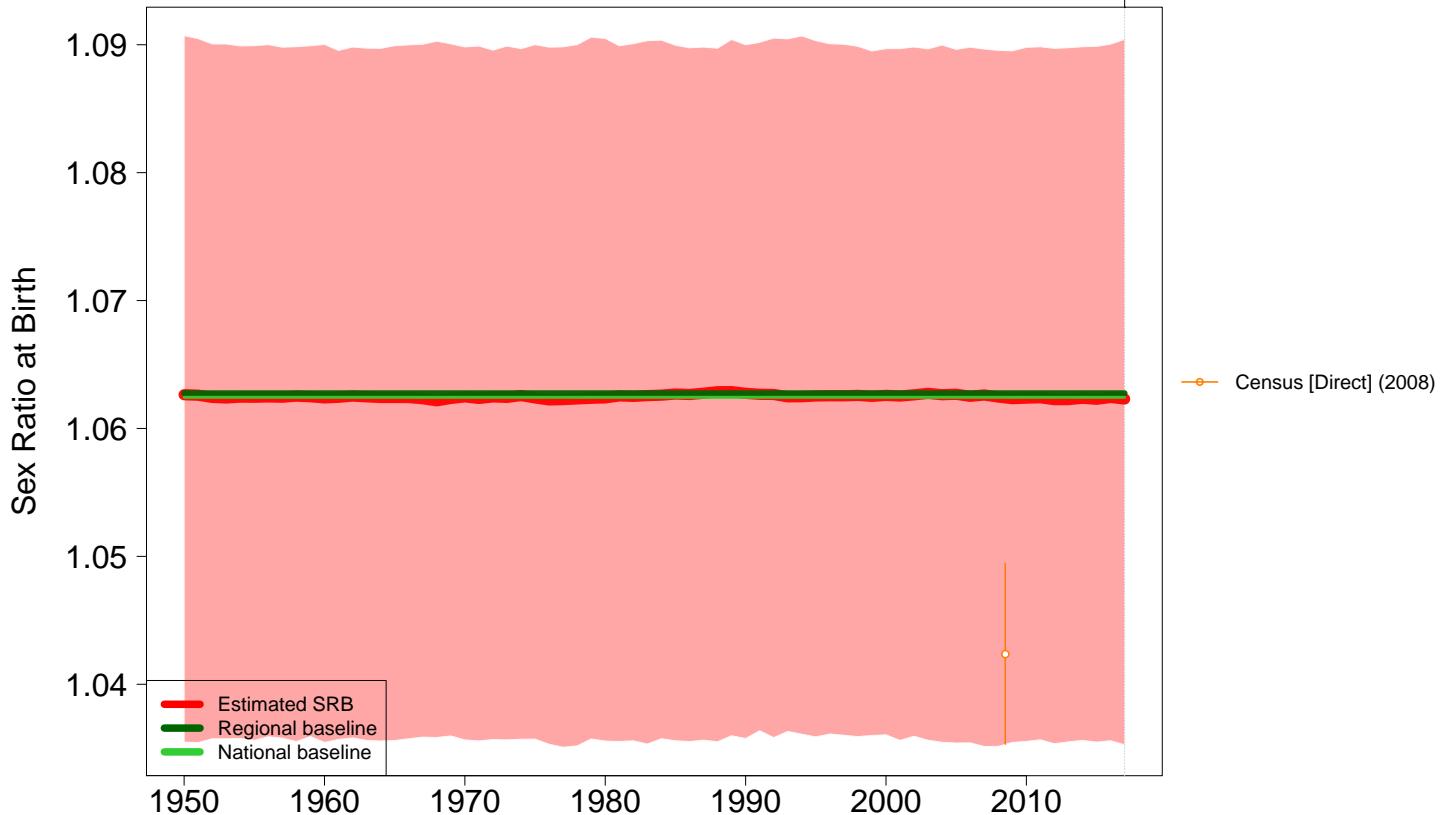
Czech Republic

2017



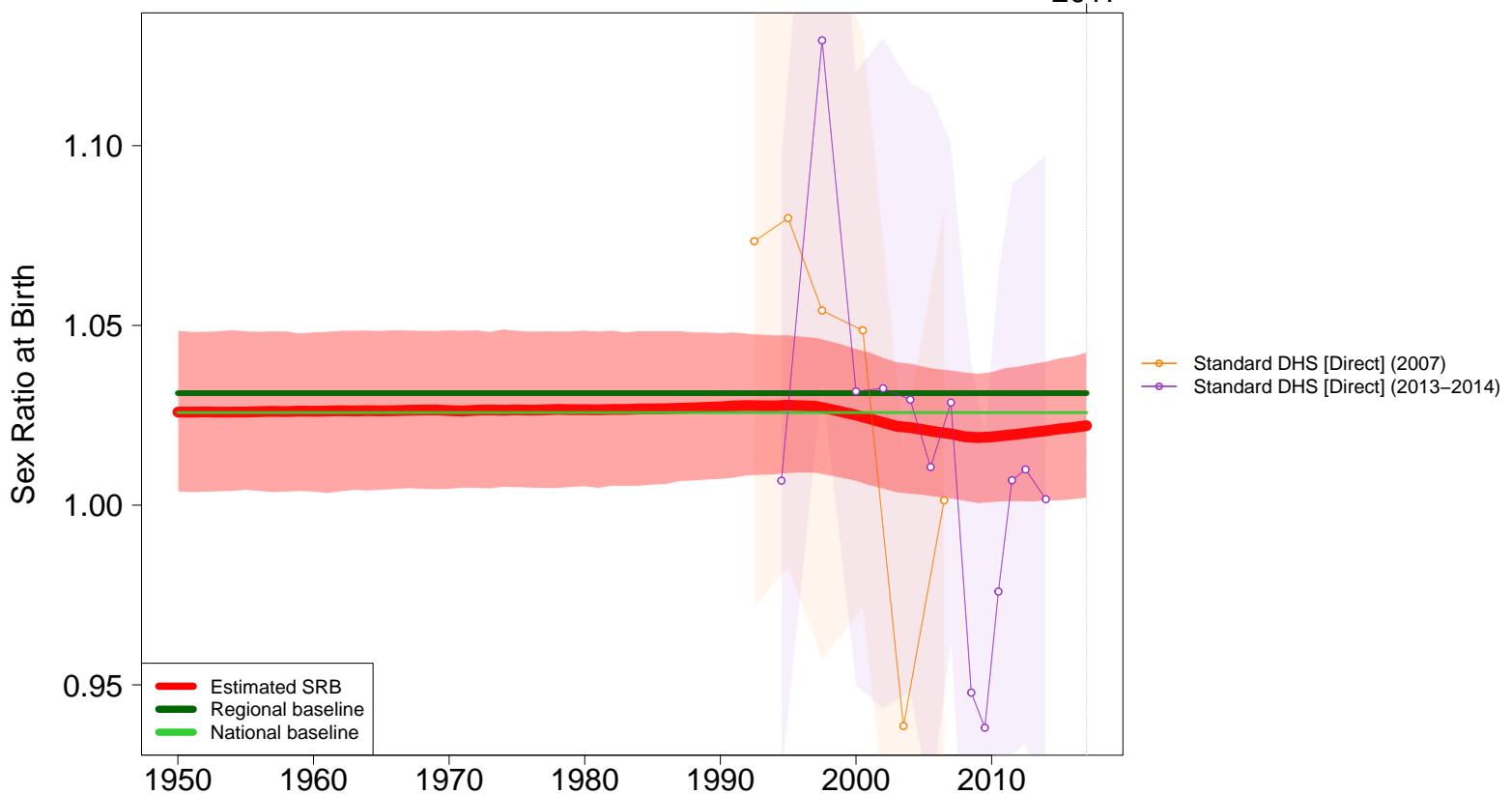
Democratic People's Republic of Korea

2017



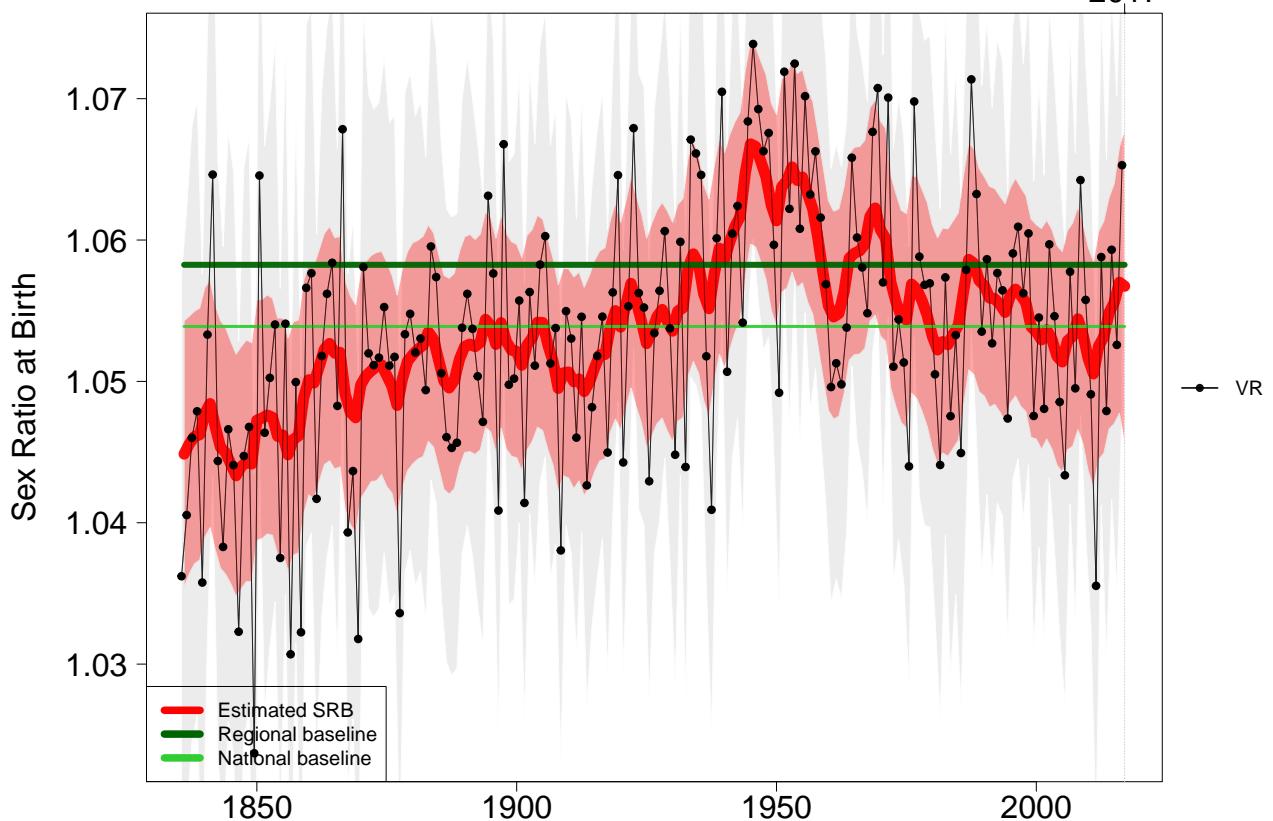
Democratic Republic of the Congo

2017



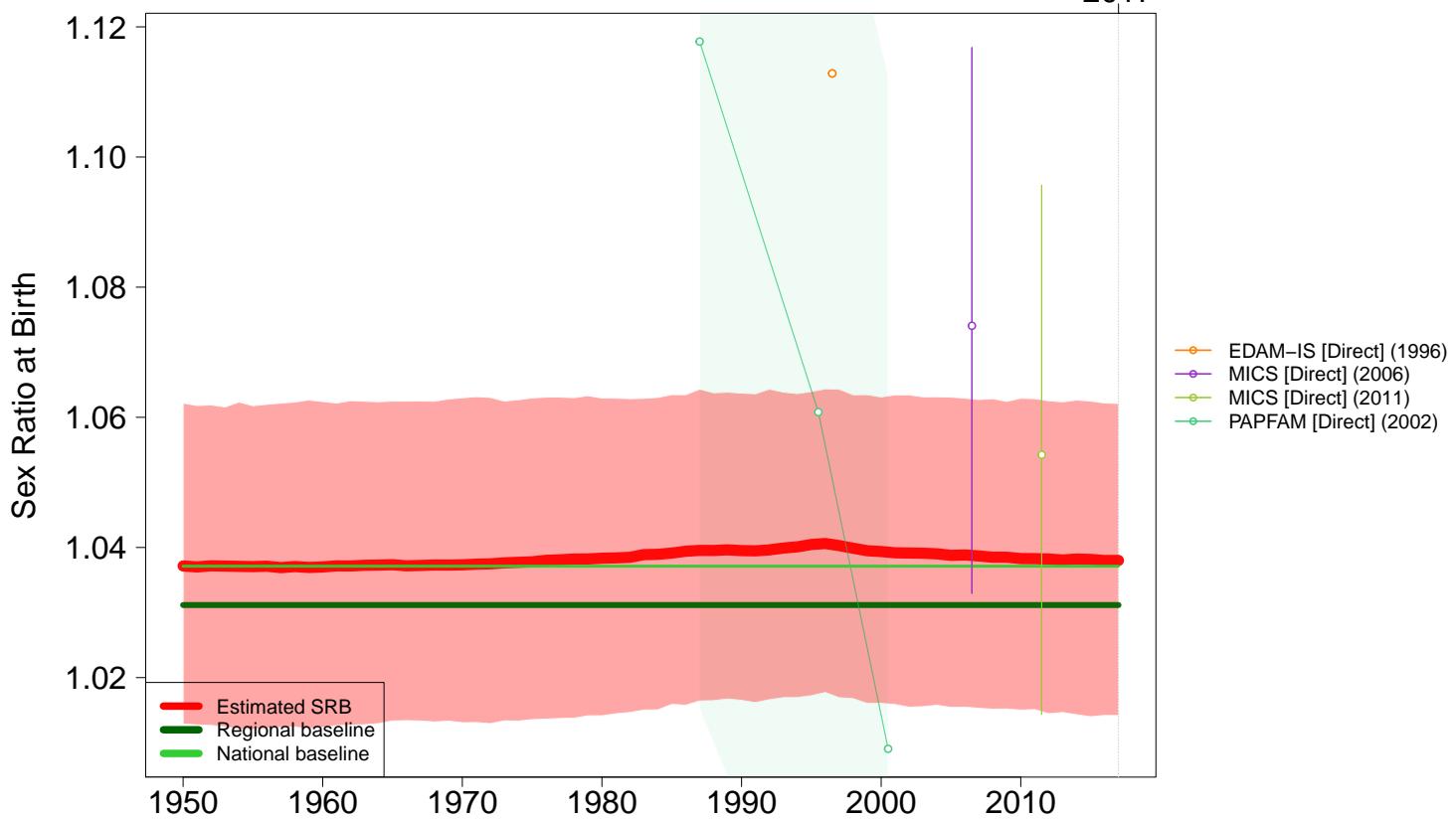
Denmark

2017



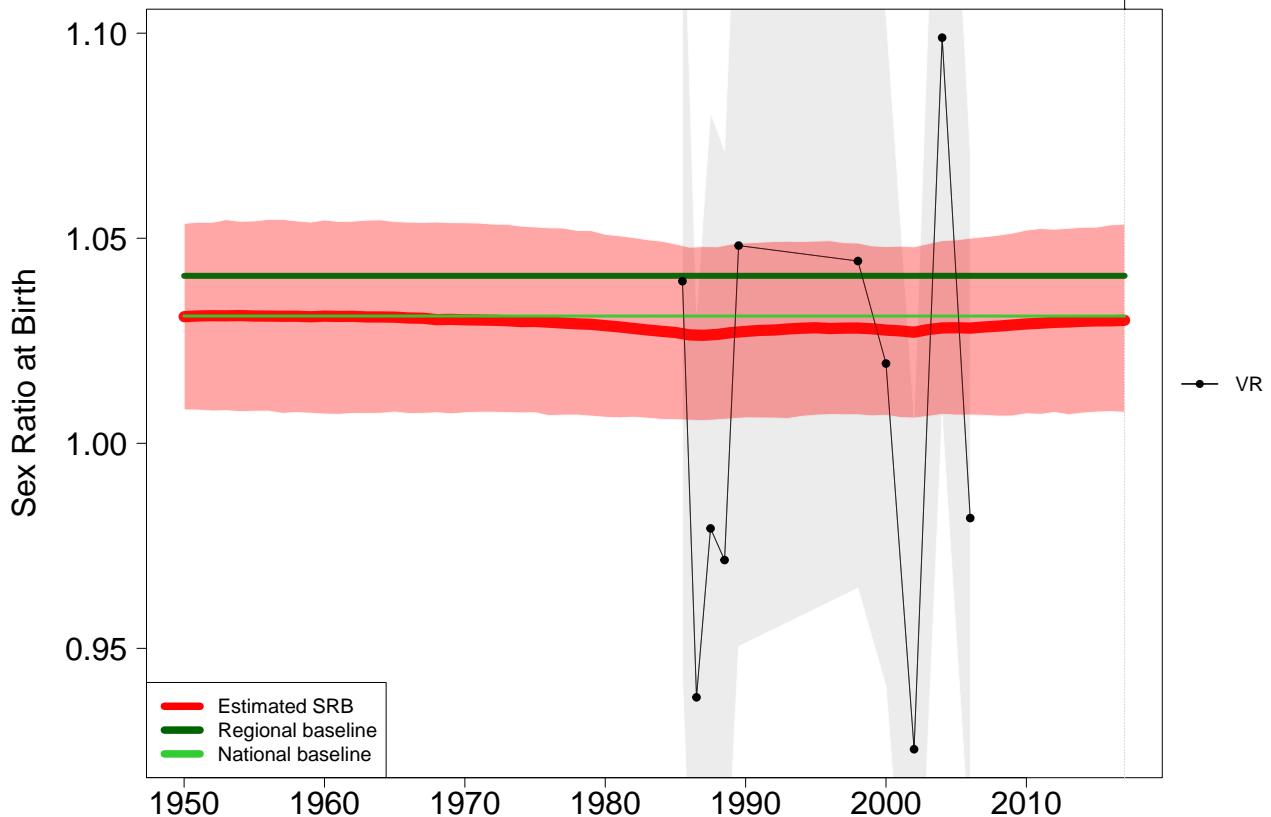
Djibouti

2017



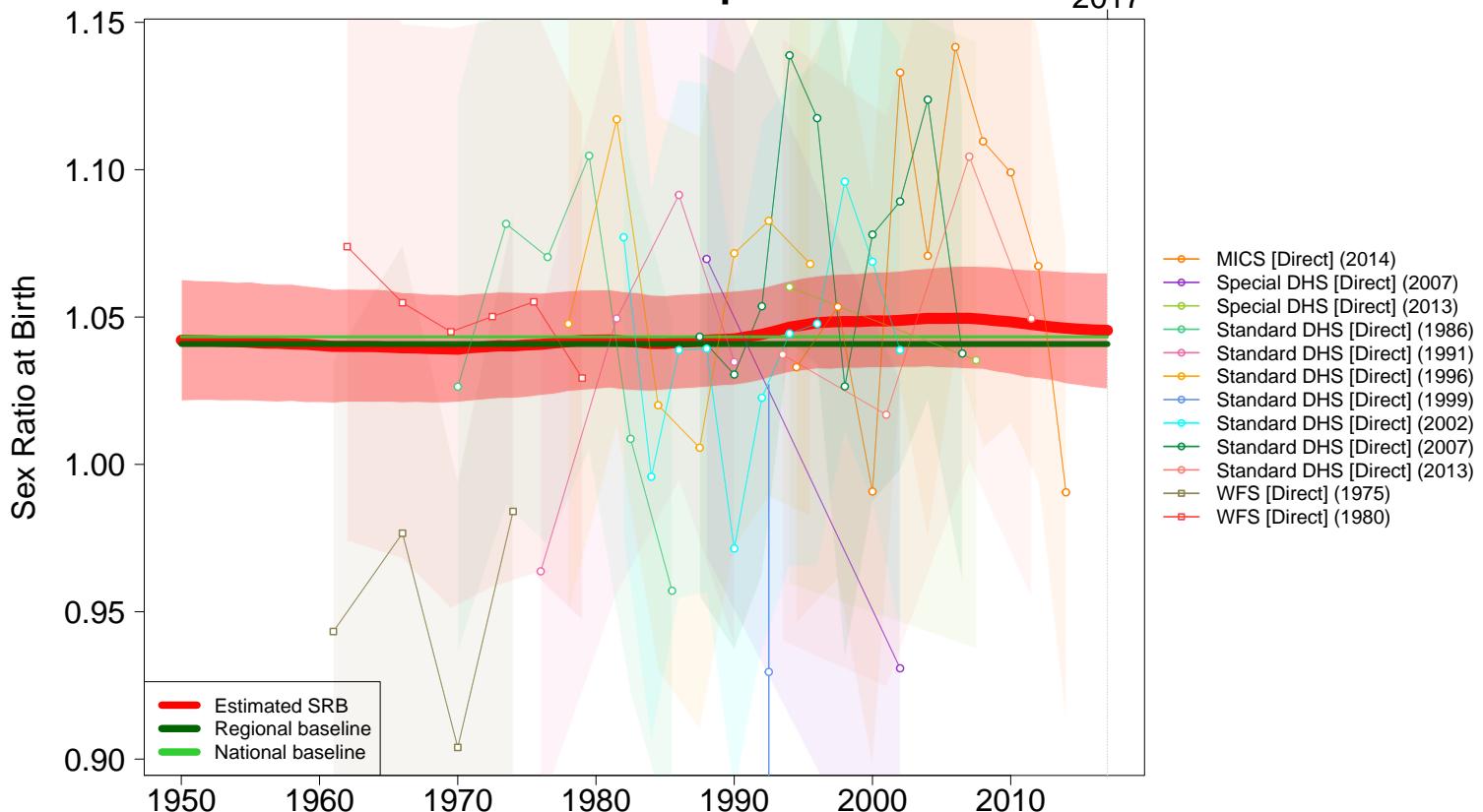
Dominica

2017



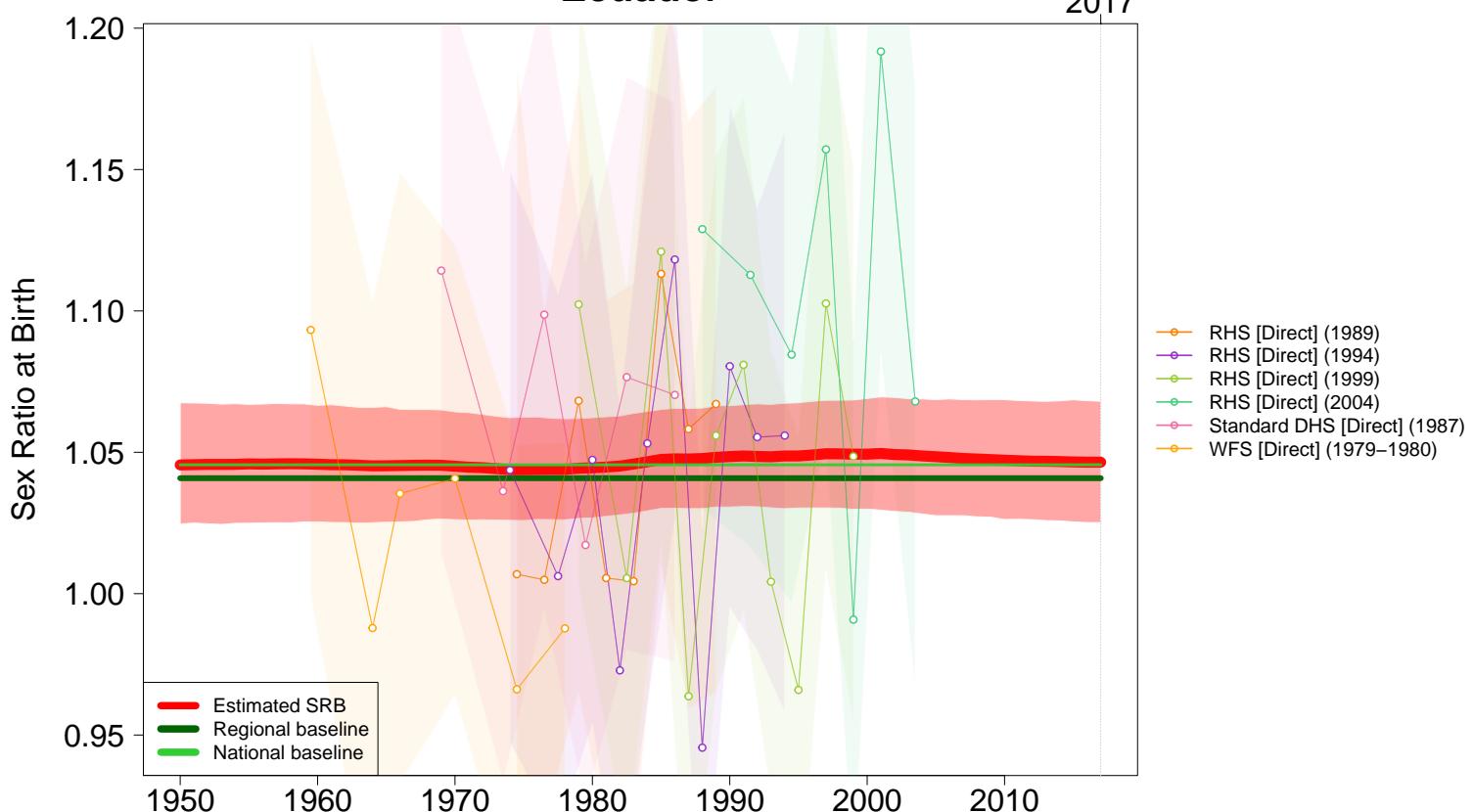
Dominican Republic

2017



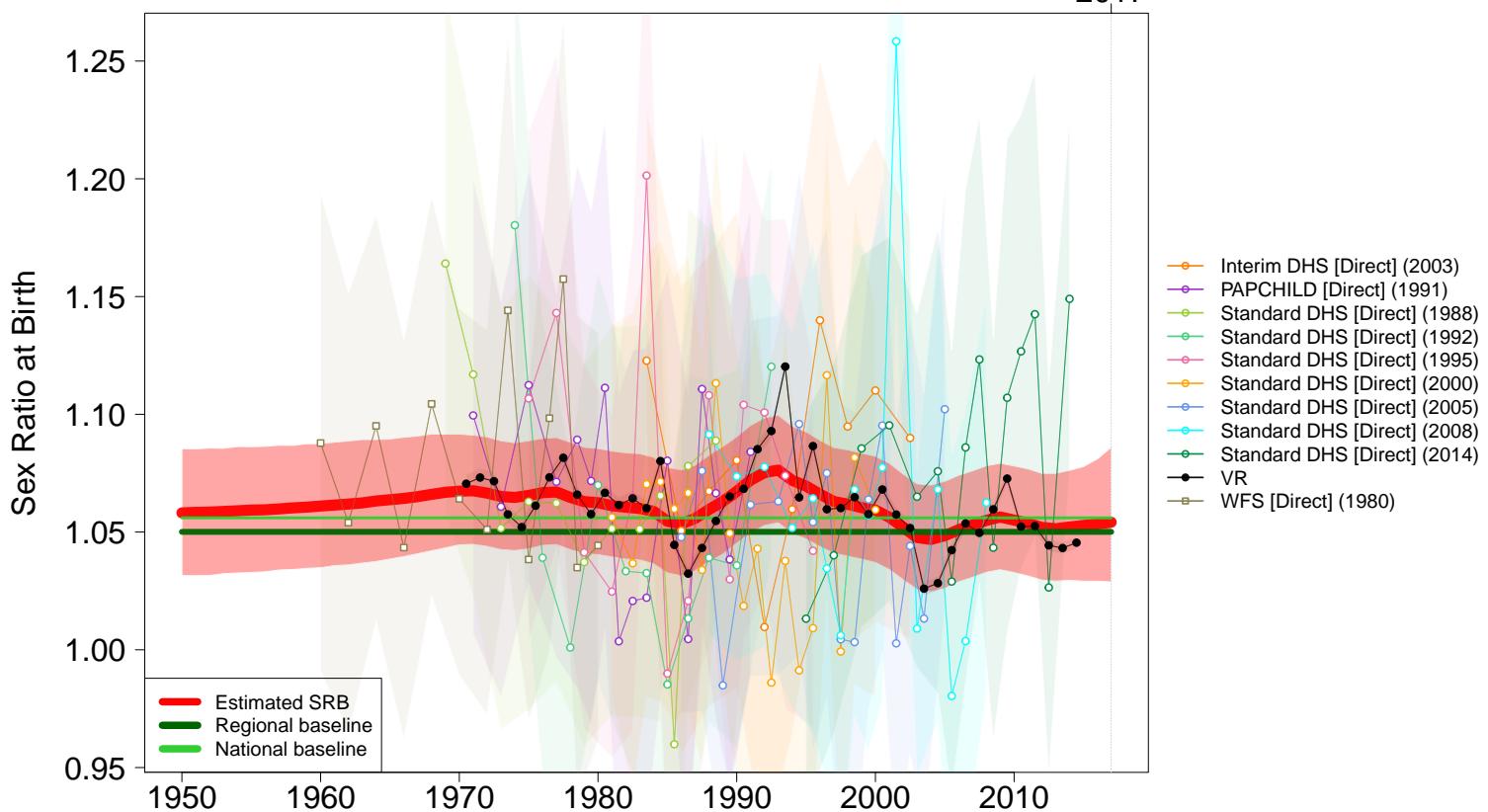
Ecuador

2017



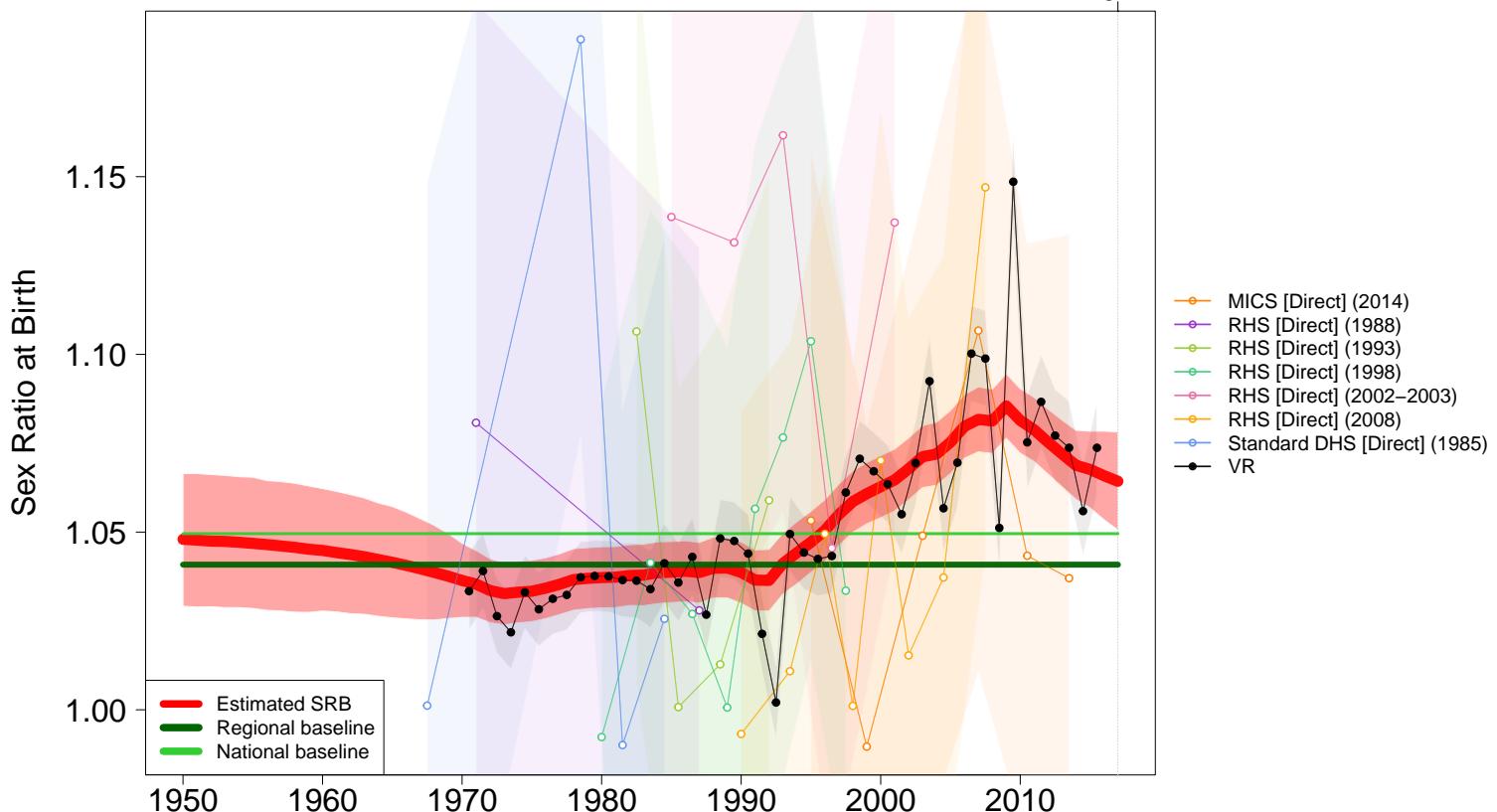
Egypt

2017



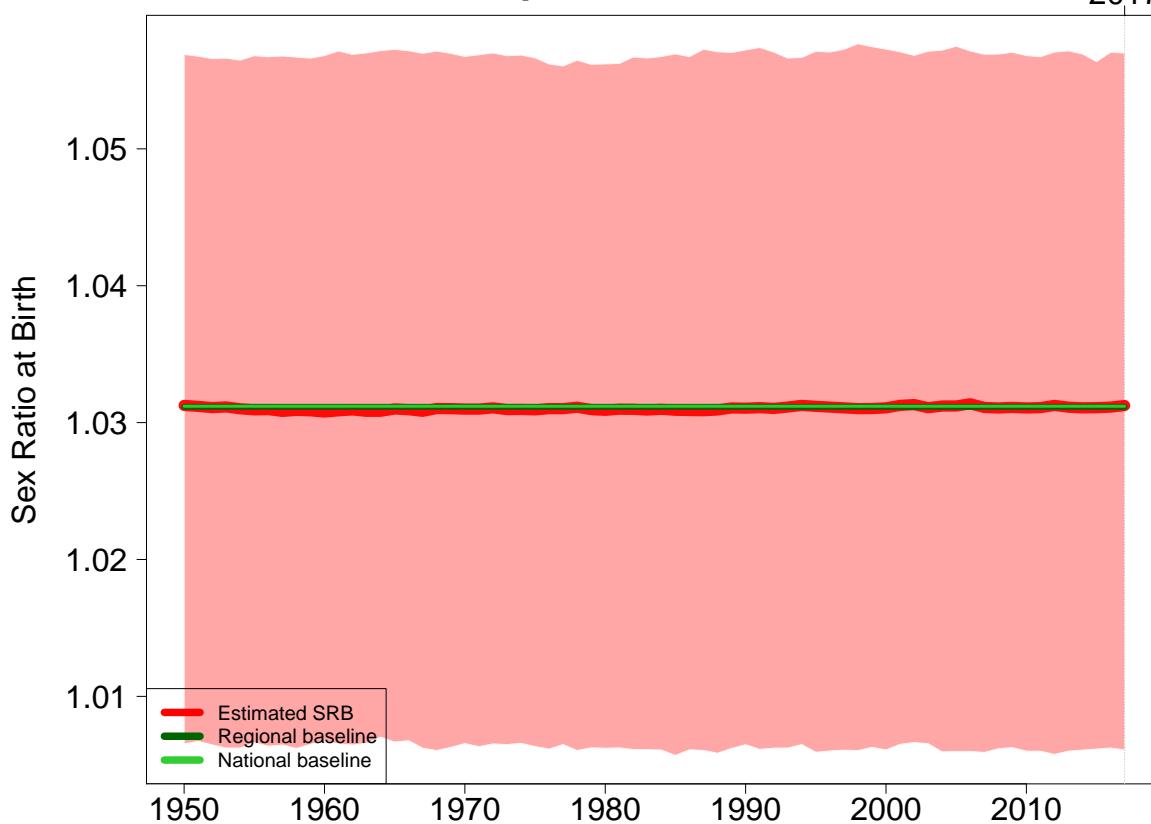
El Salvador

2017



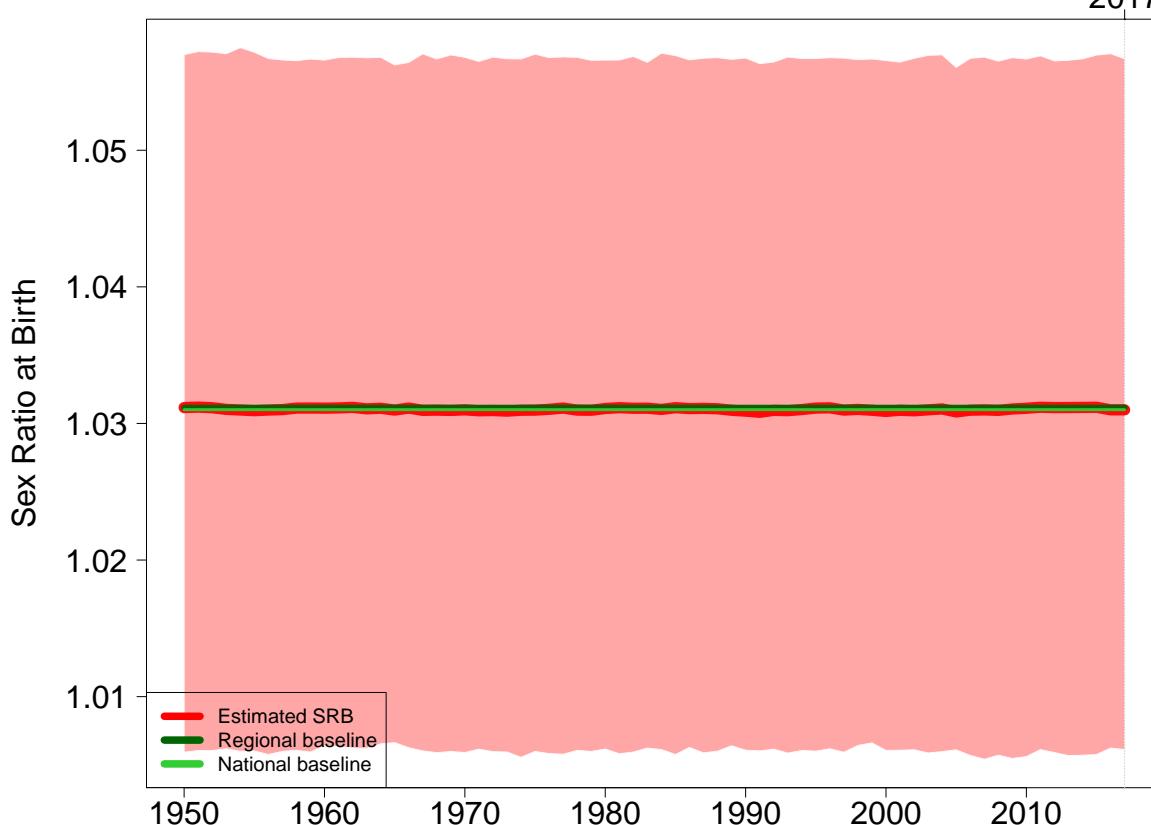
Equatorial Guinea

2017



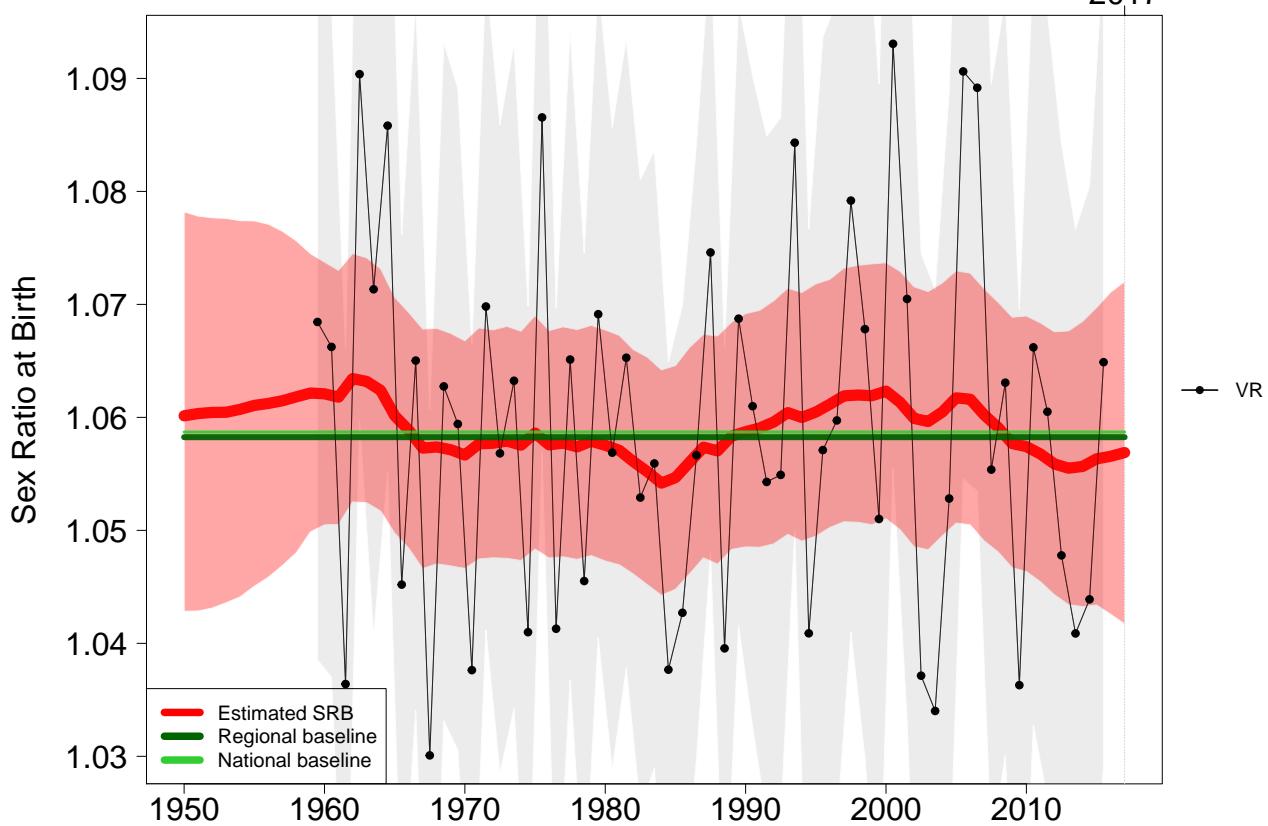
Eritrea

2017



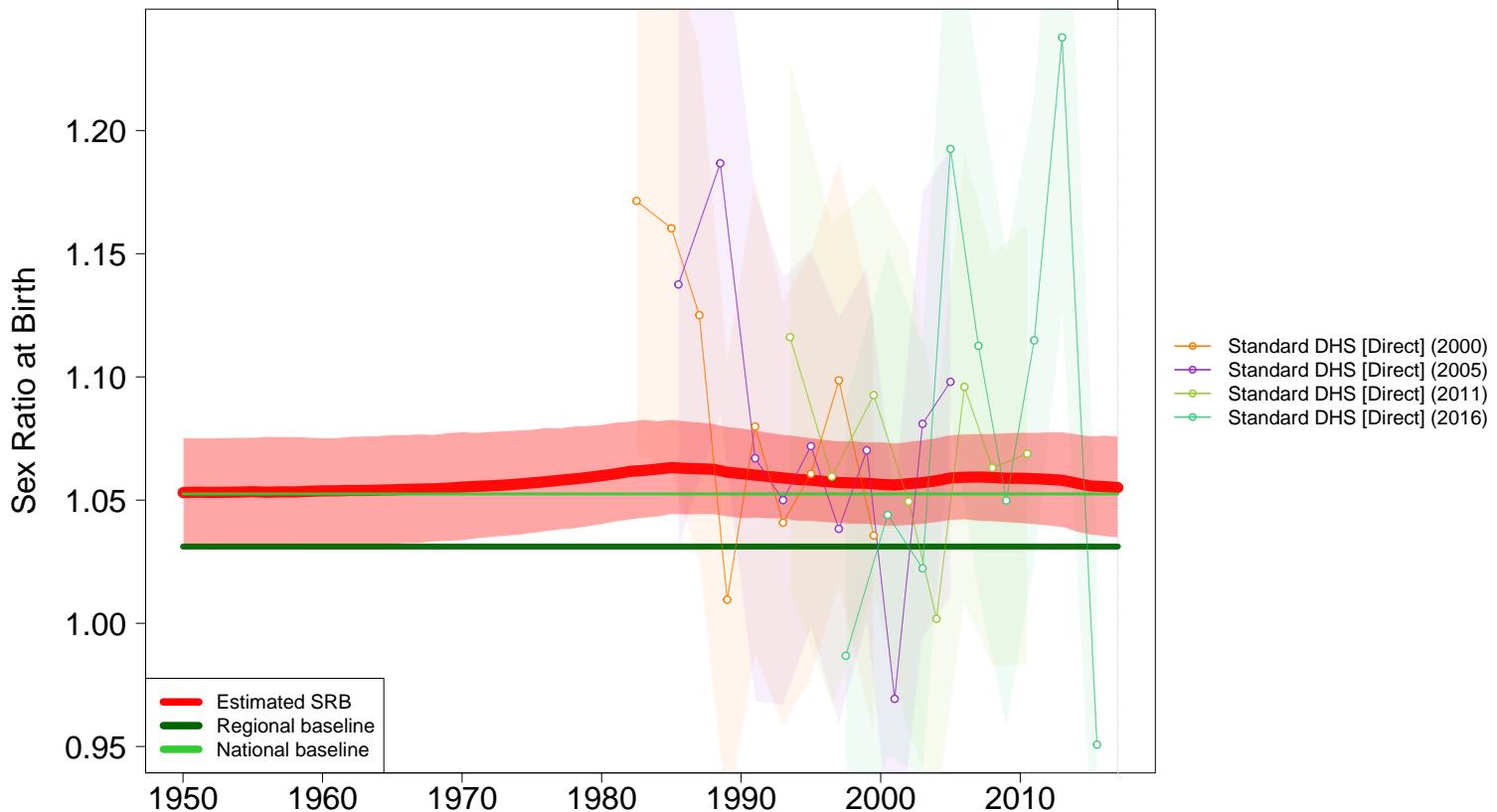
Estonia

2017



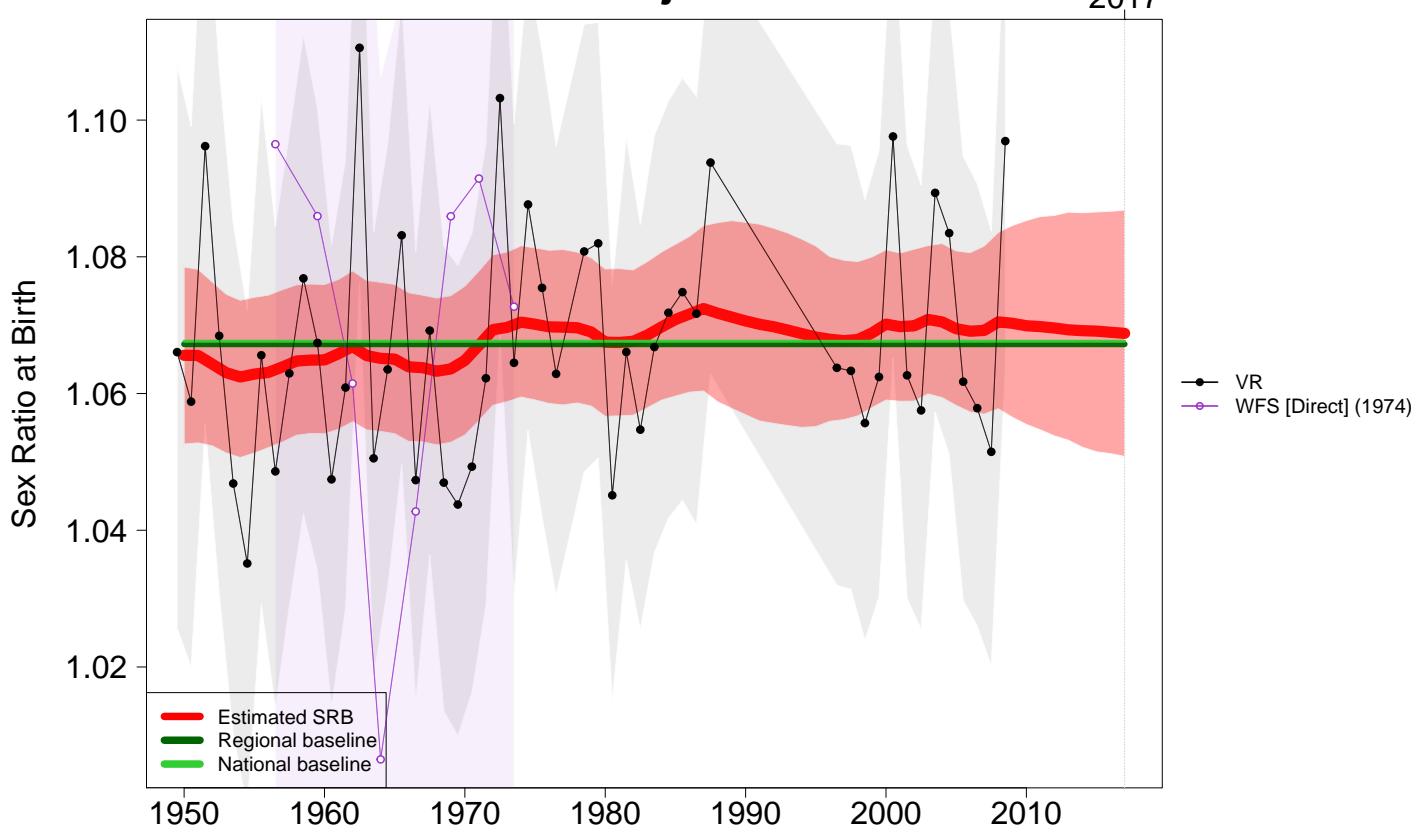
Ethiopia

2017



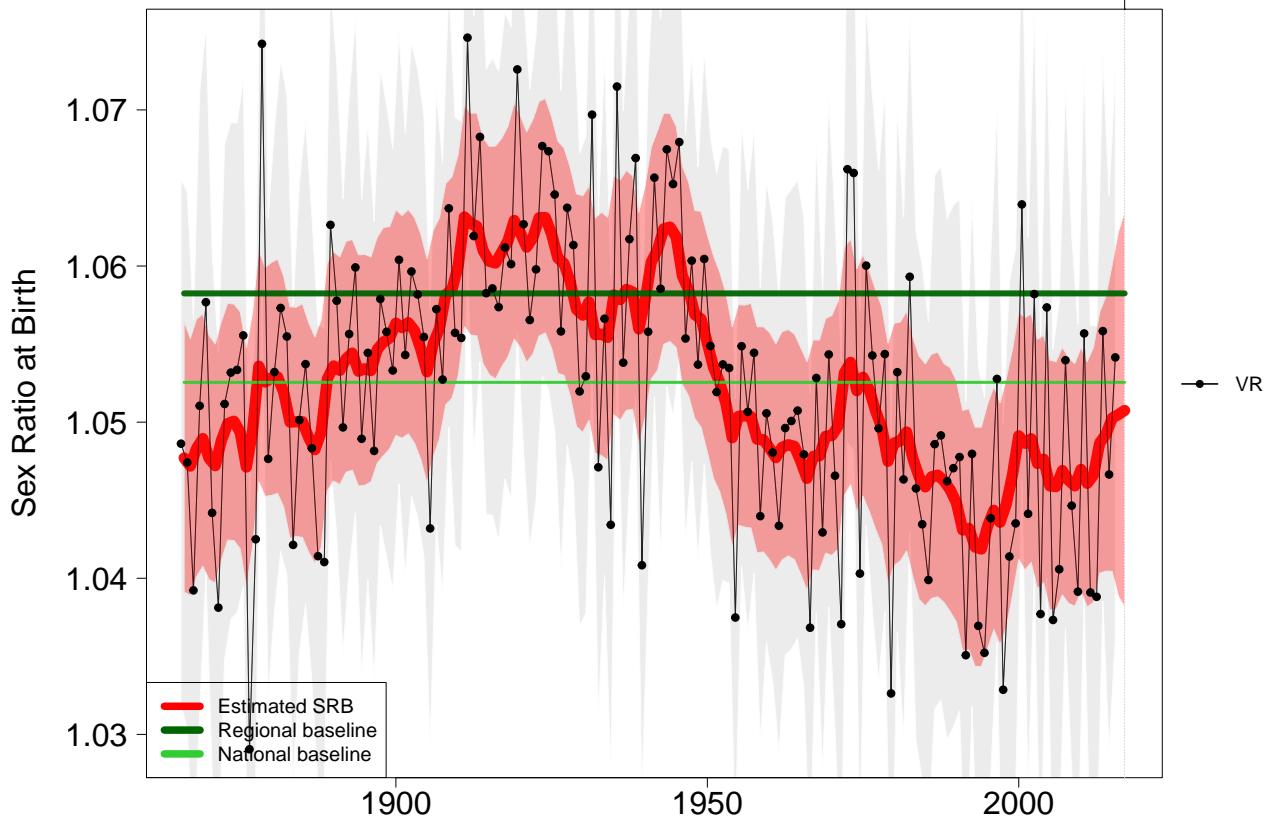
Fiji

2017



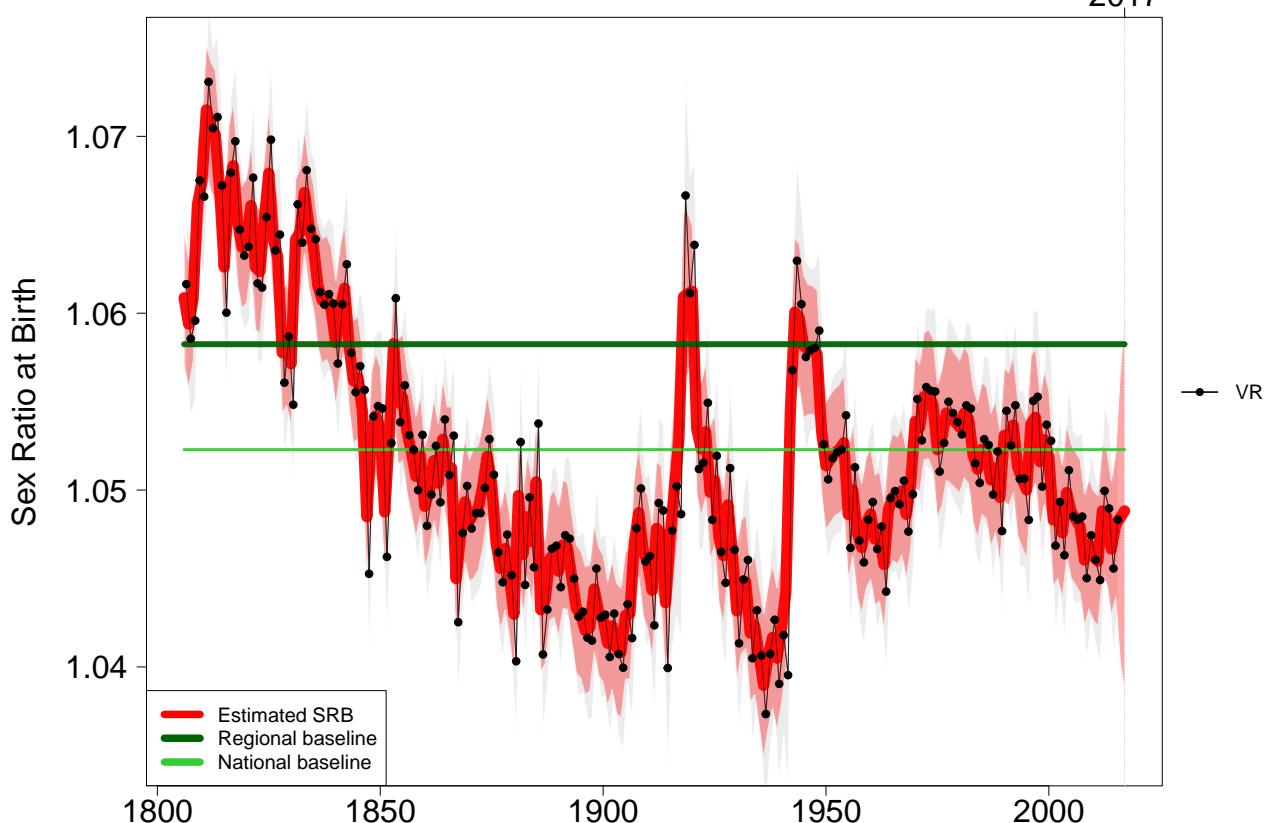
Finland

2017



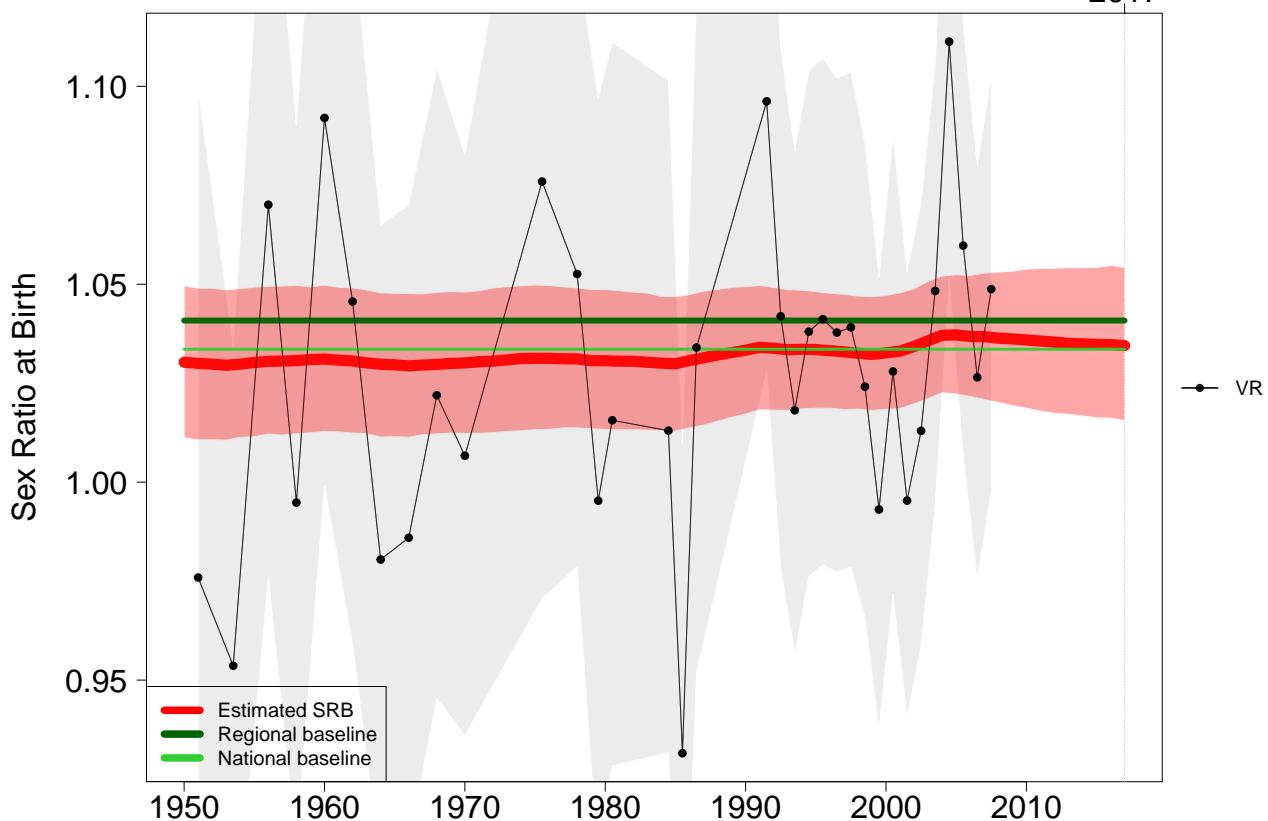
France

2017



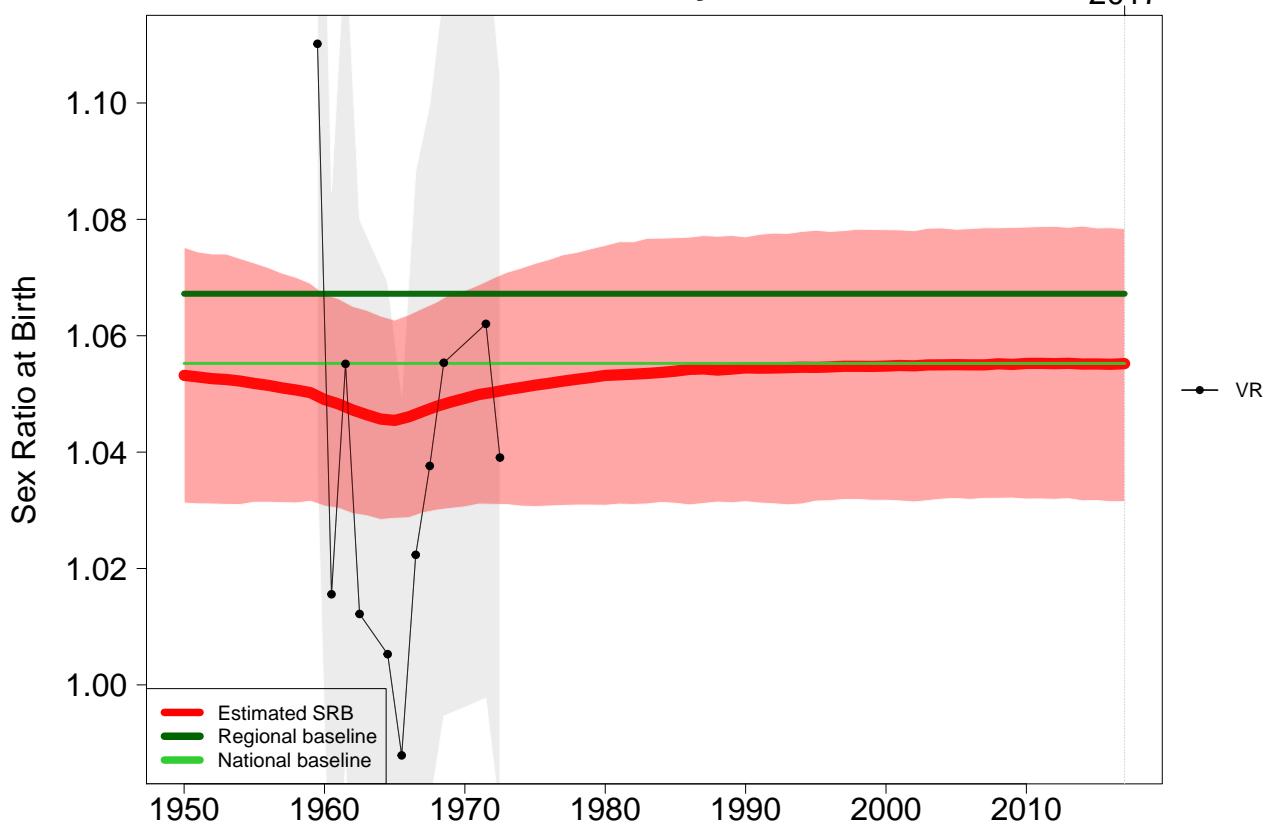
French Guiana

2017



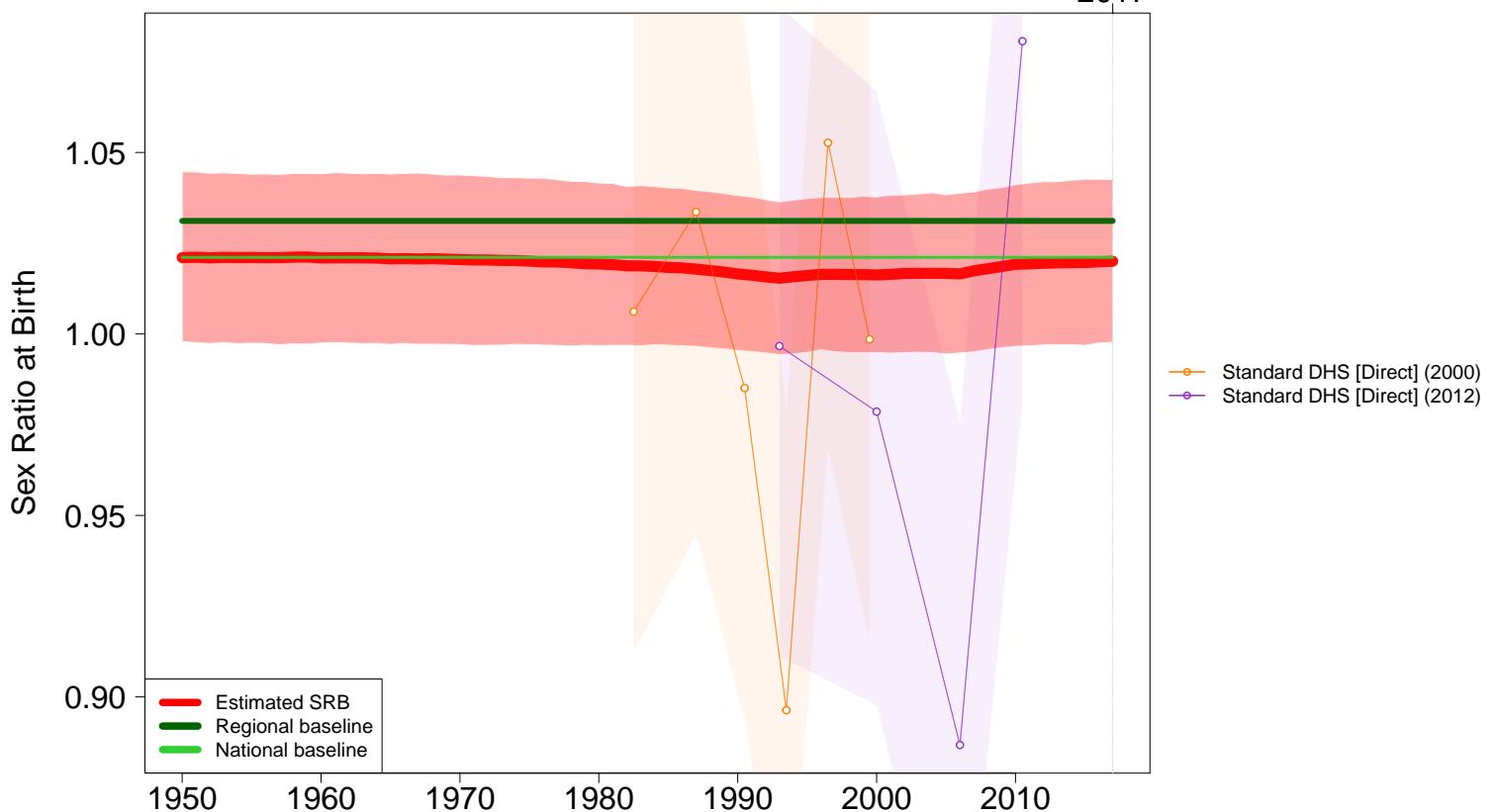
French Polynesia

2017



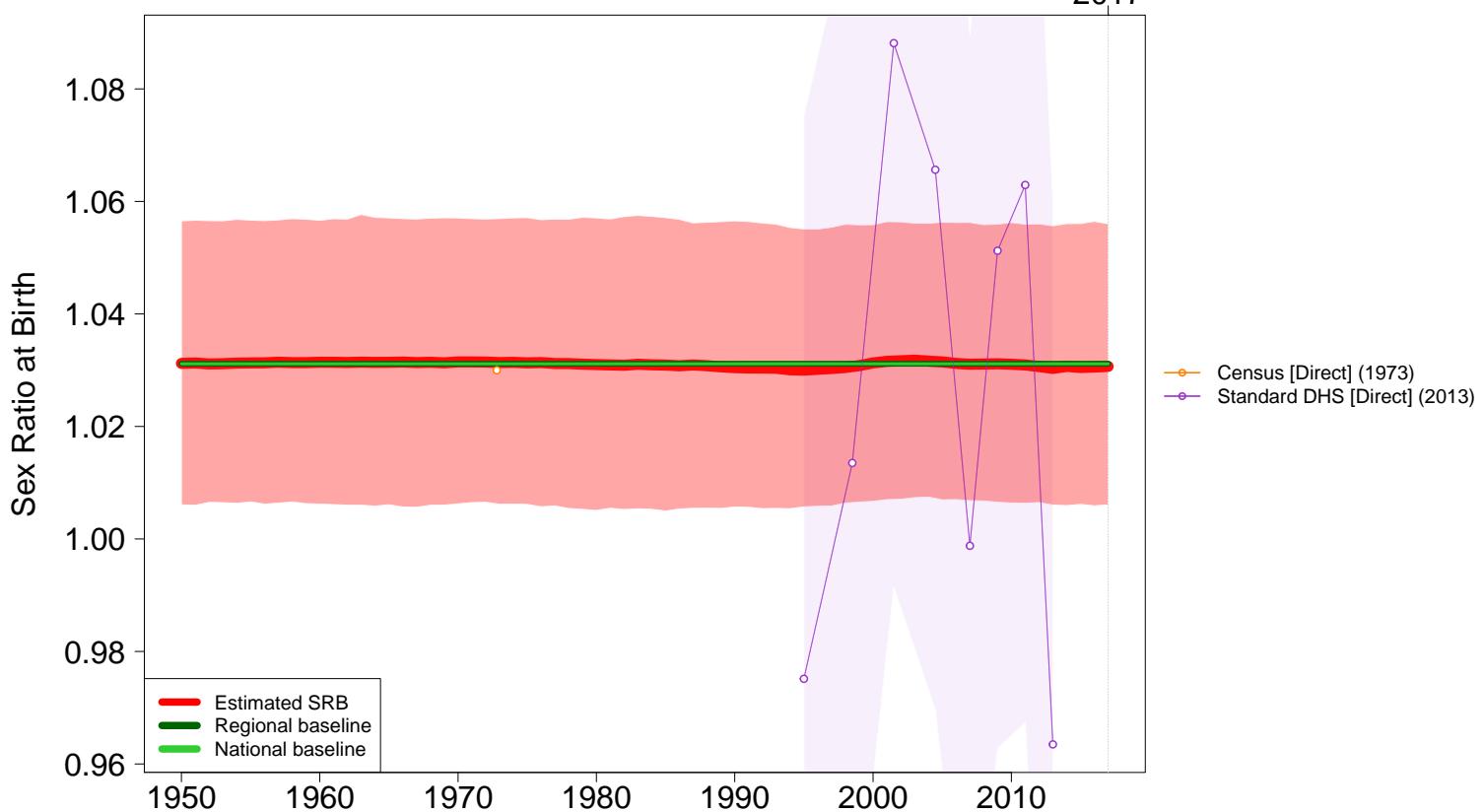
Gabon

2017



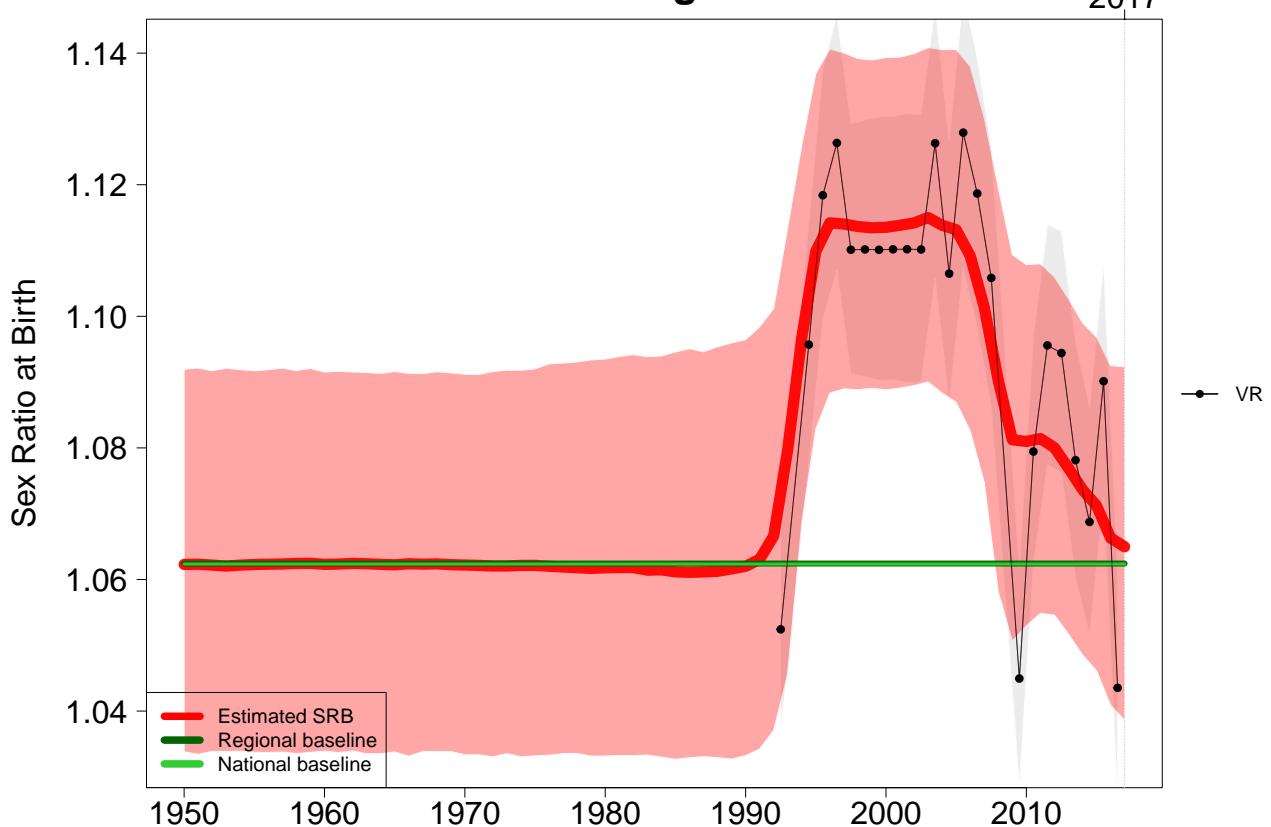
Gambia

2017



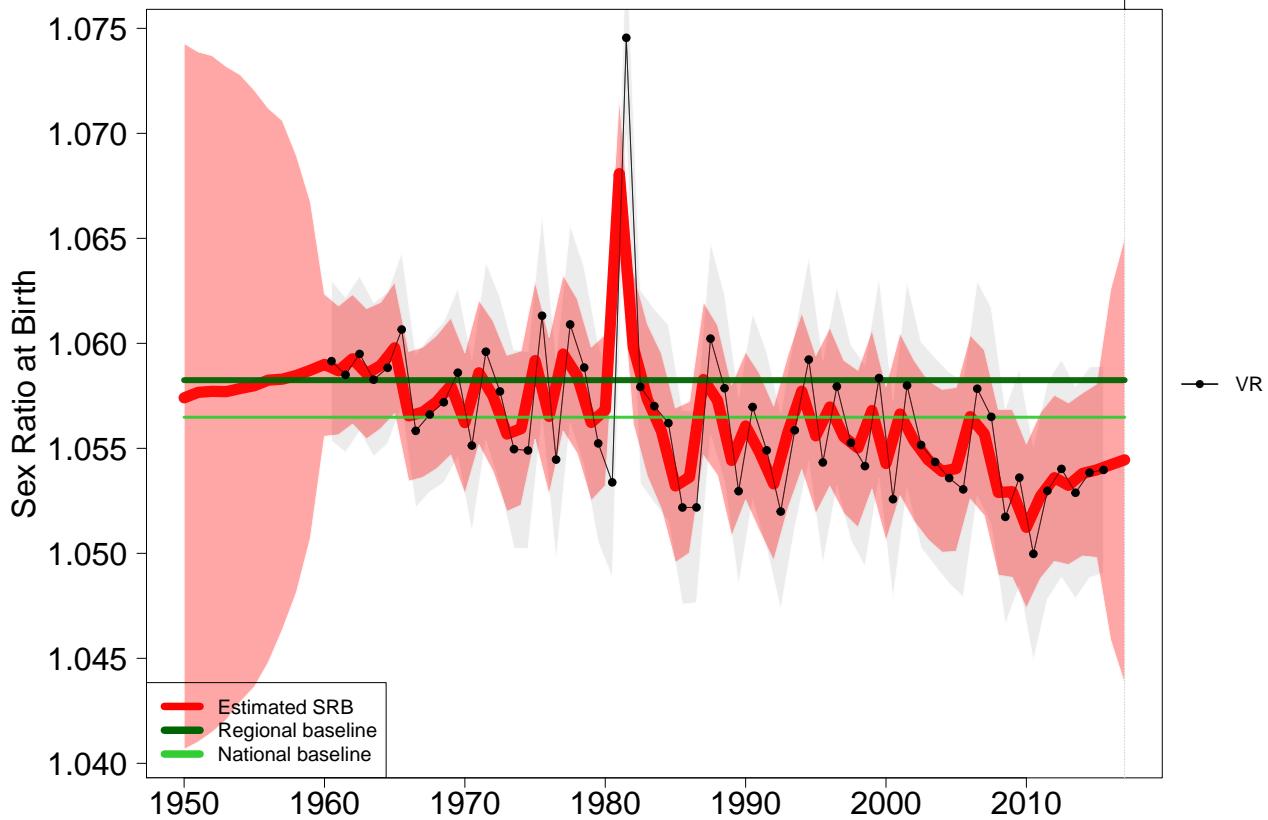
Georgia

2017



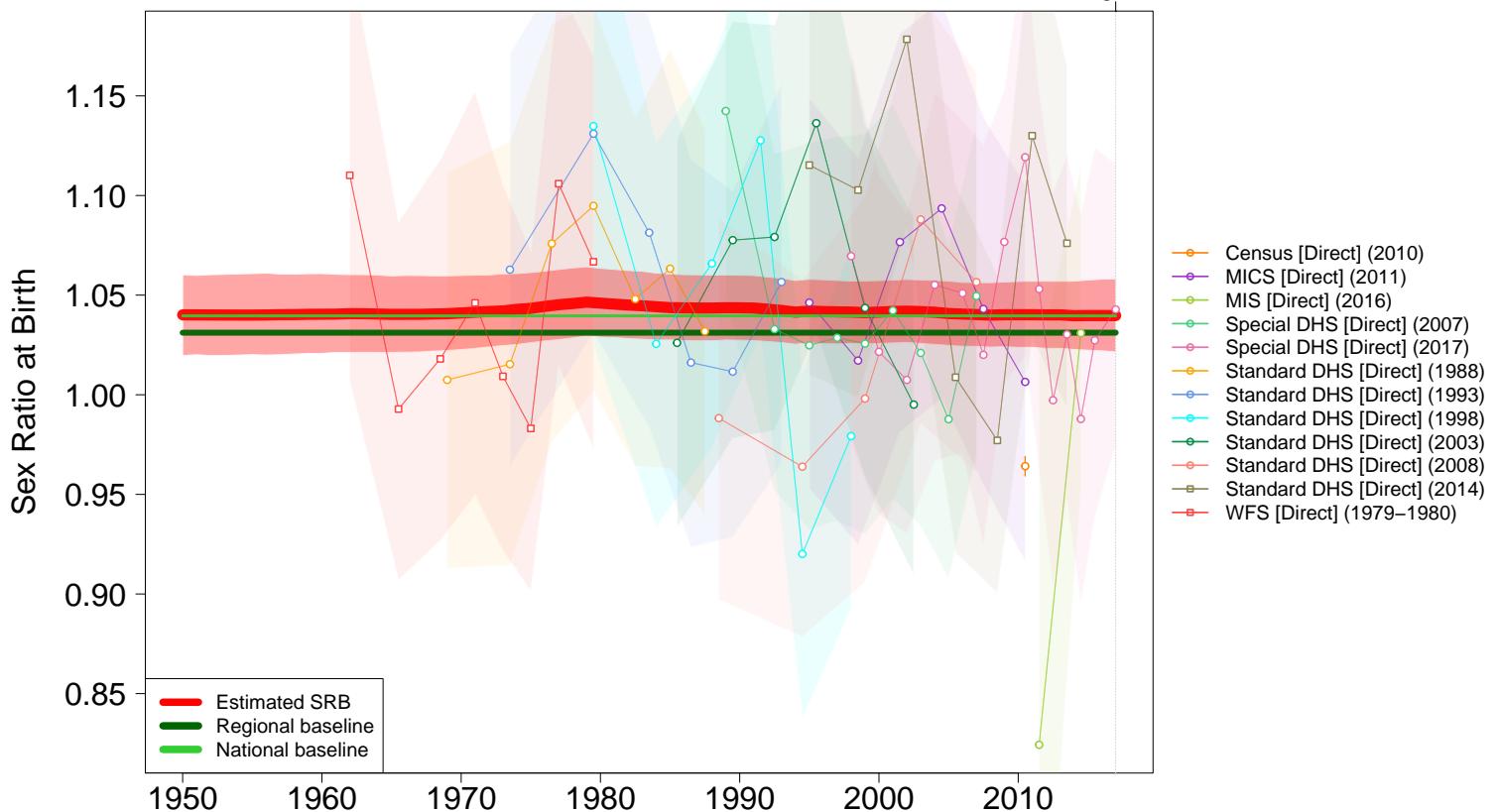
Germany

2017



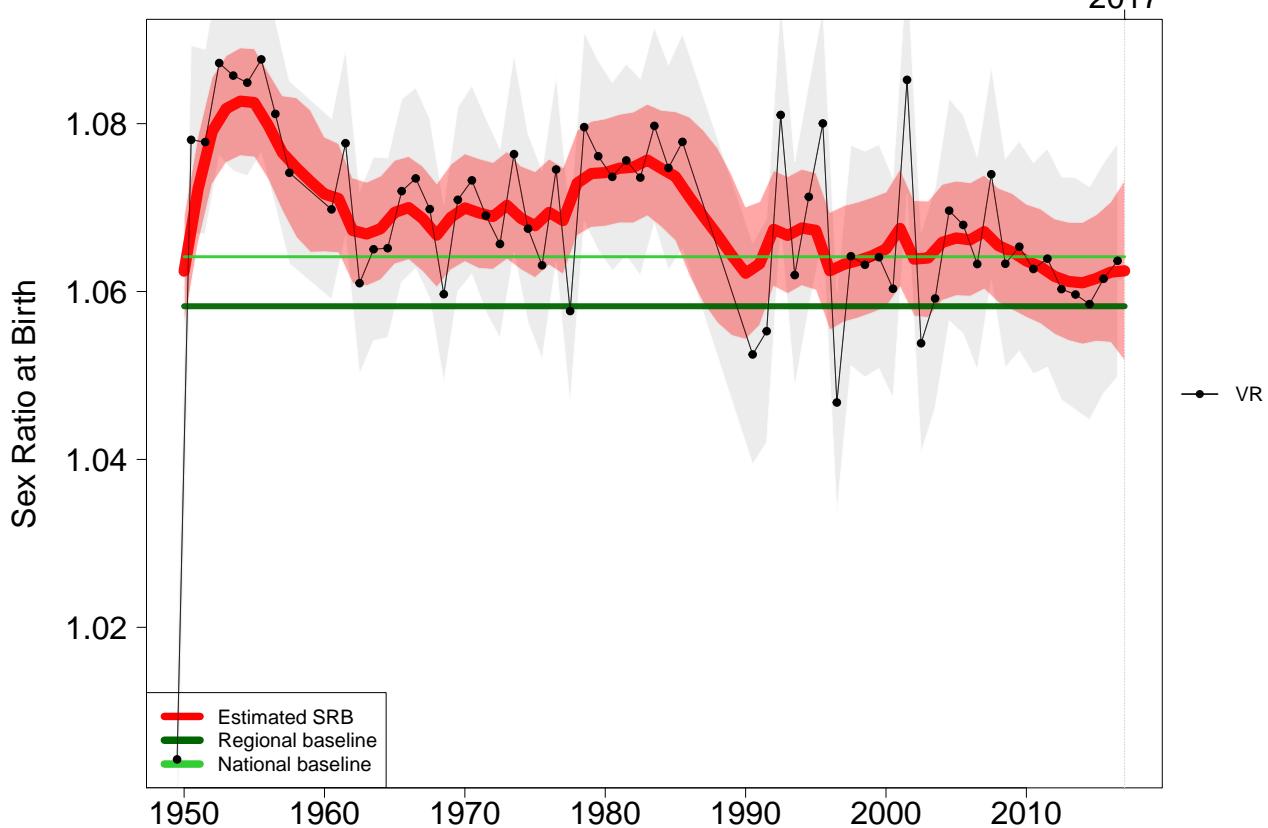
Ghana

2017



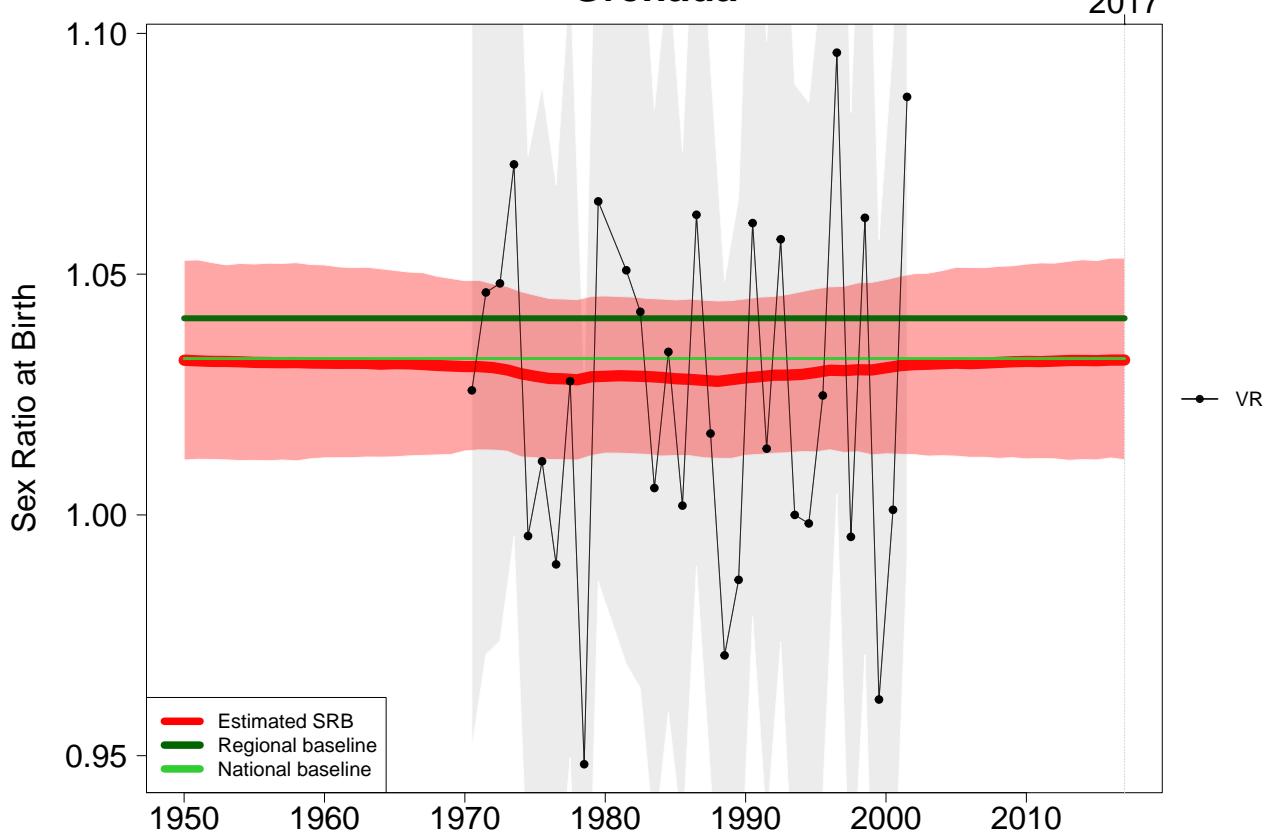
Greece

2017



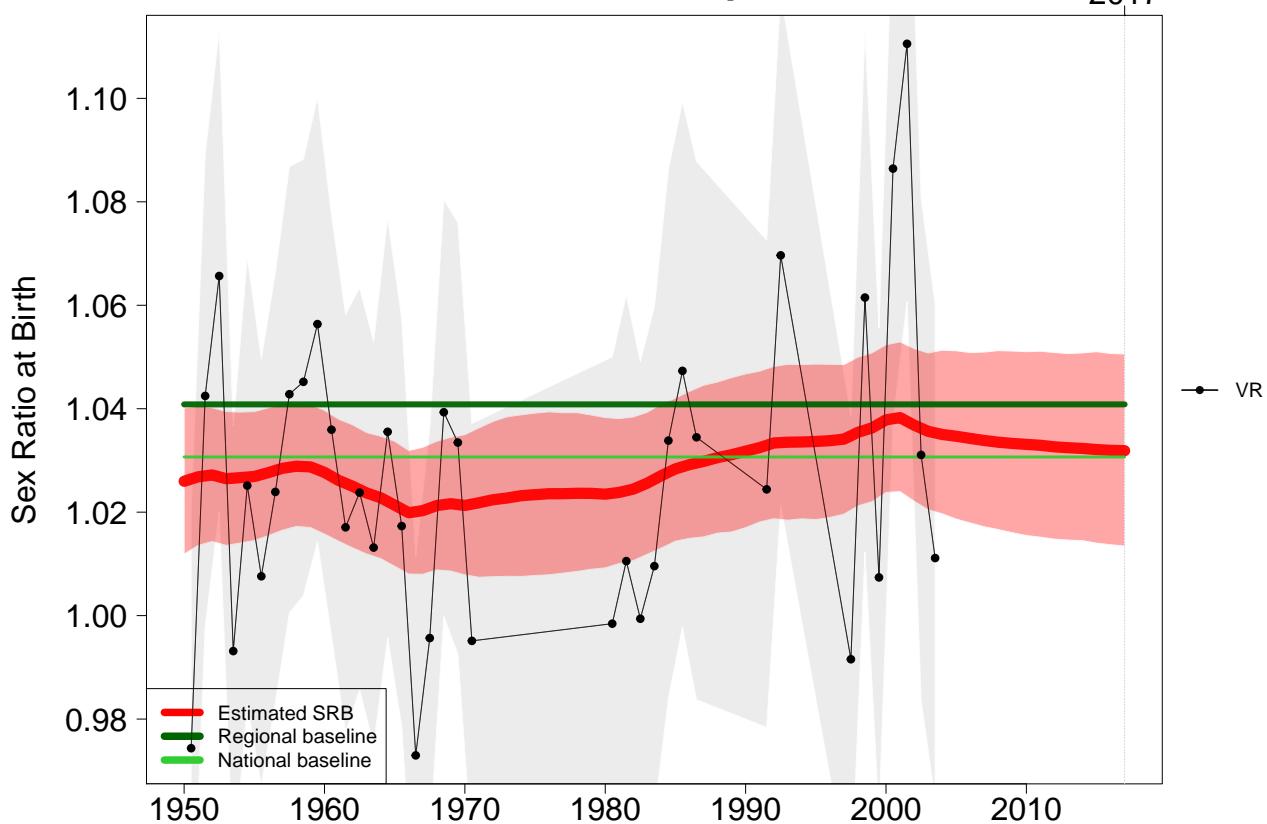
Grenada

2017



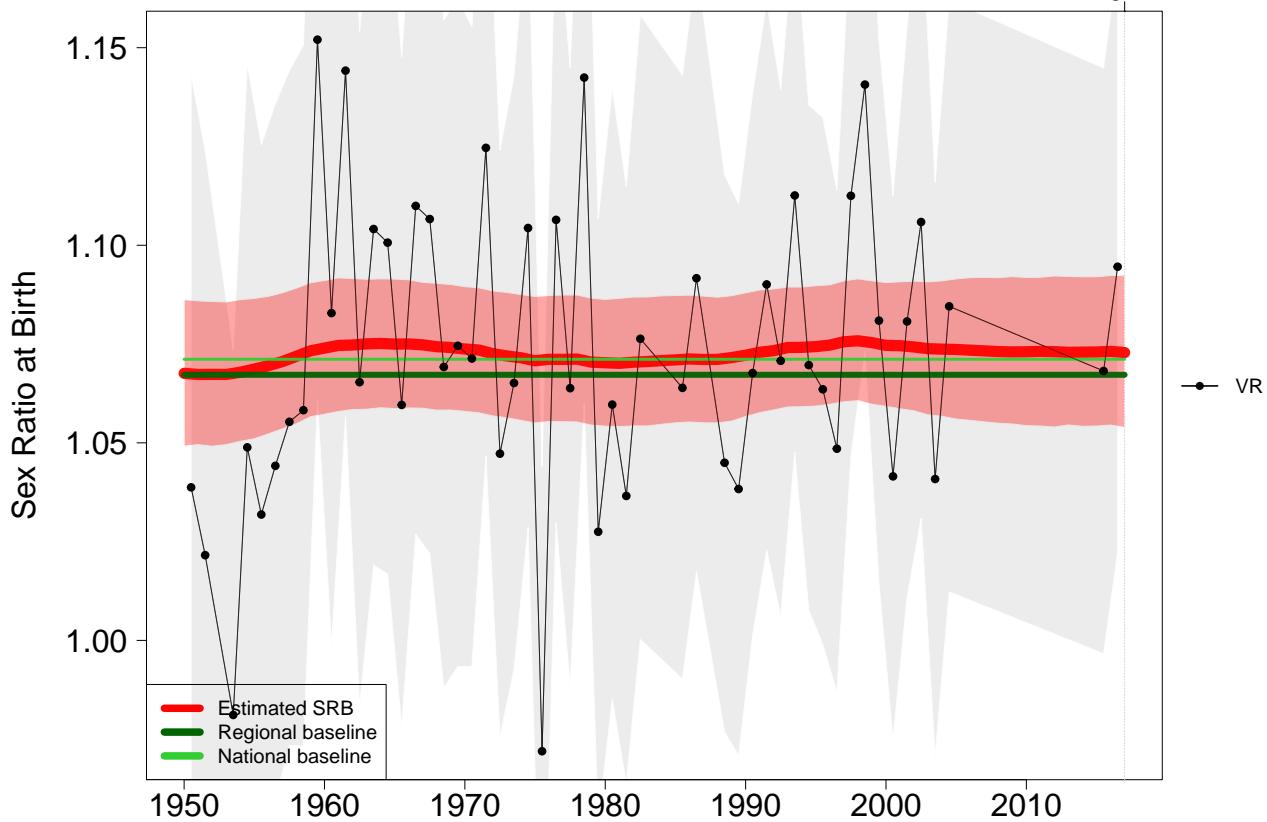
Guadeloupe

2017



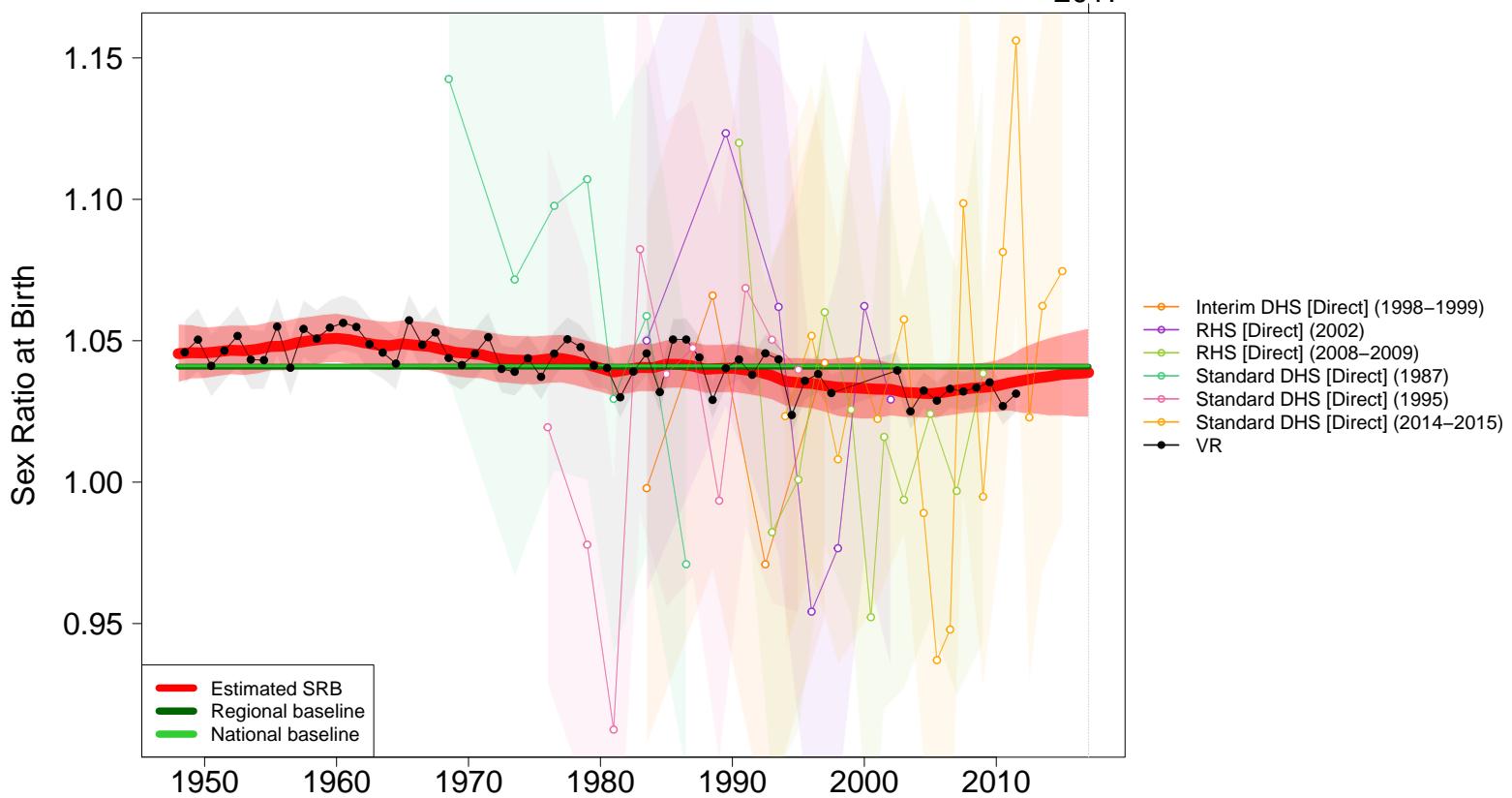
Guam

2017



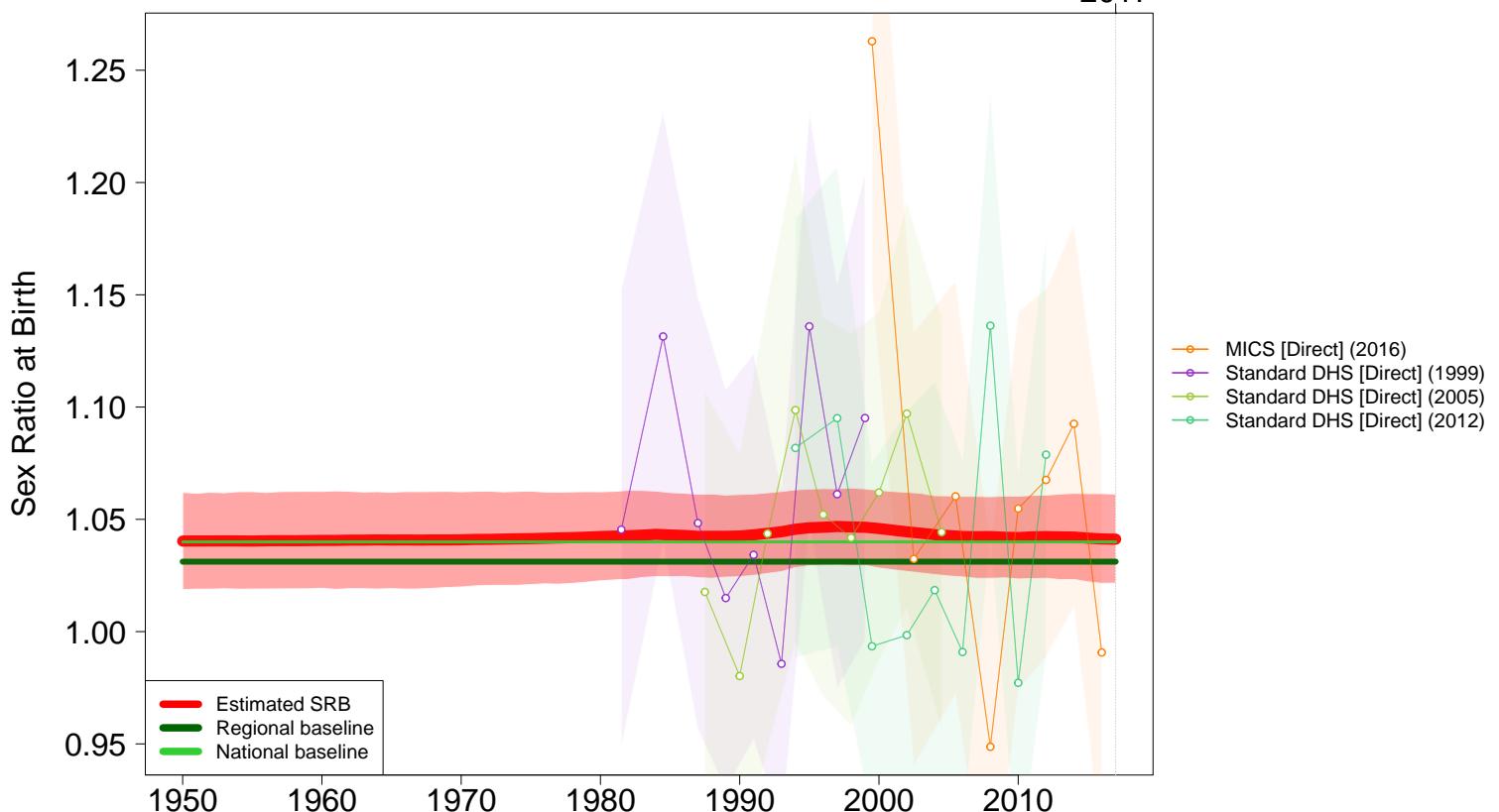
Guatemala

2017



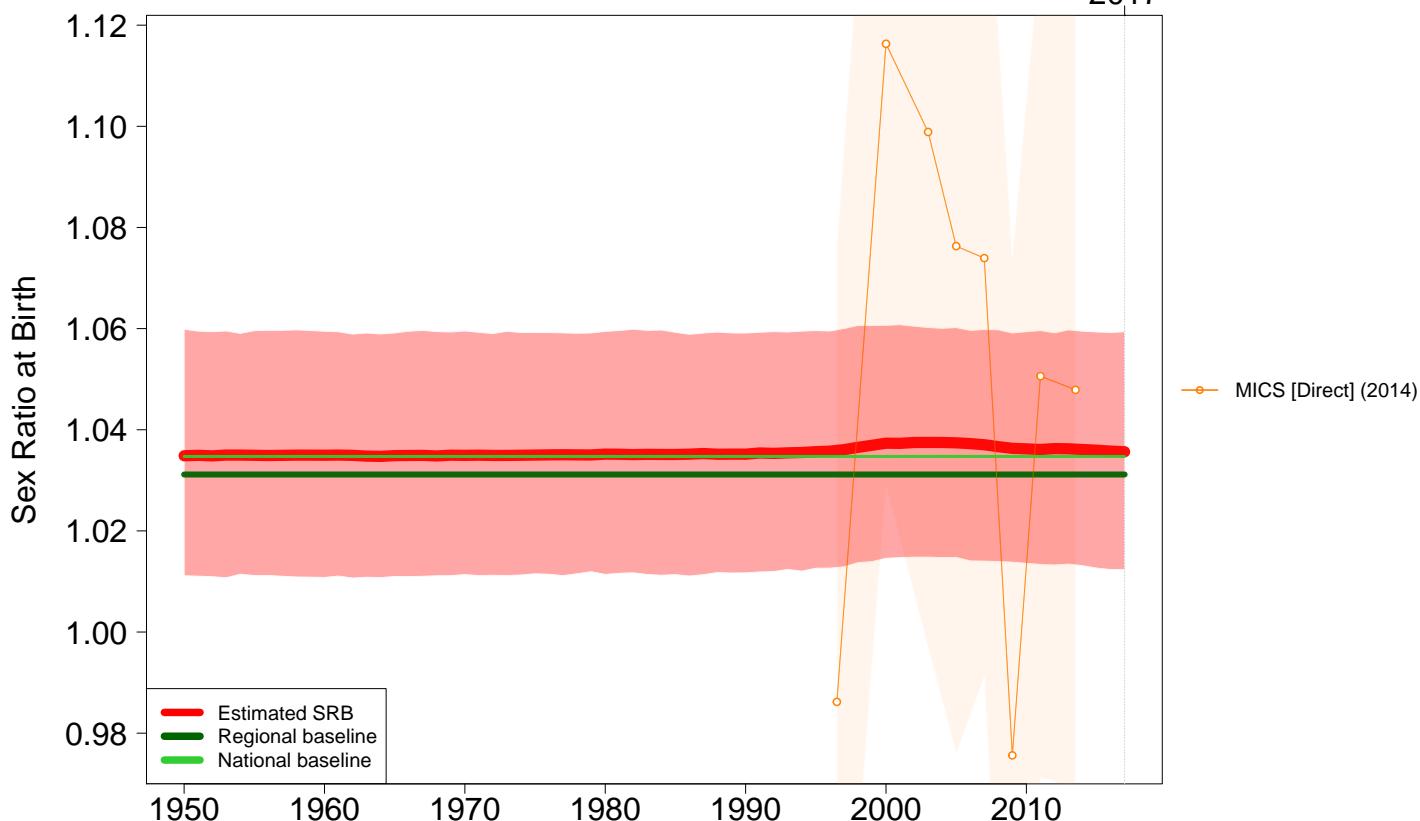
Guinea

2017



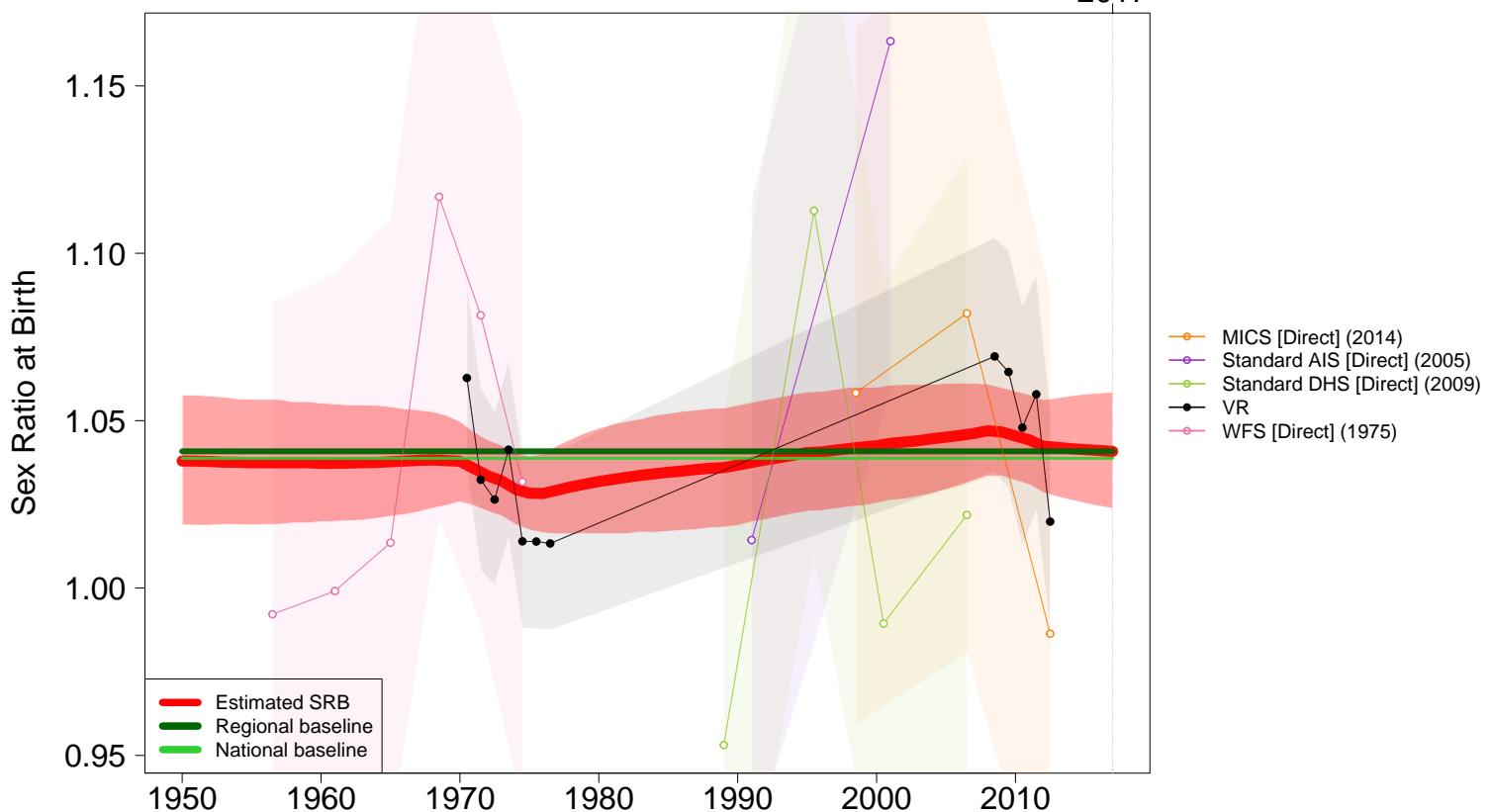
Guinea-Bissau

2017



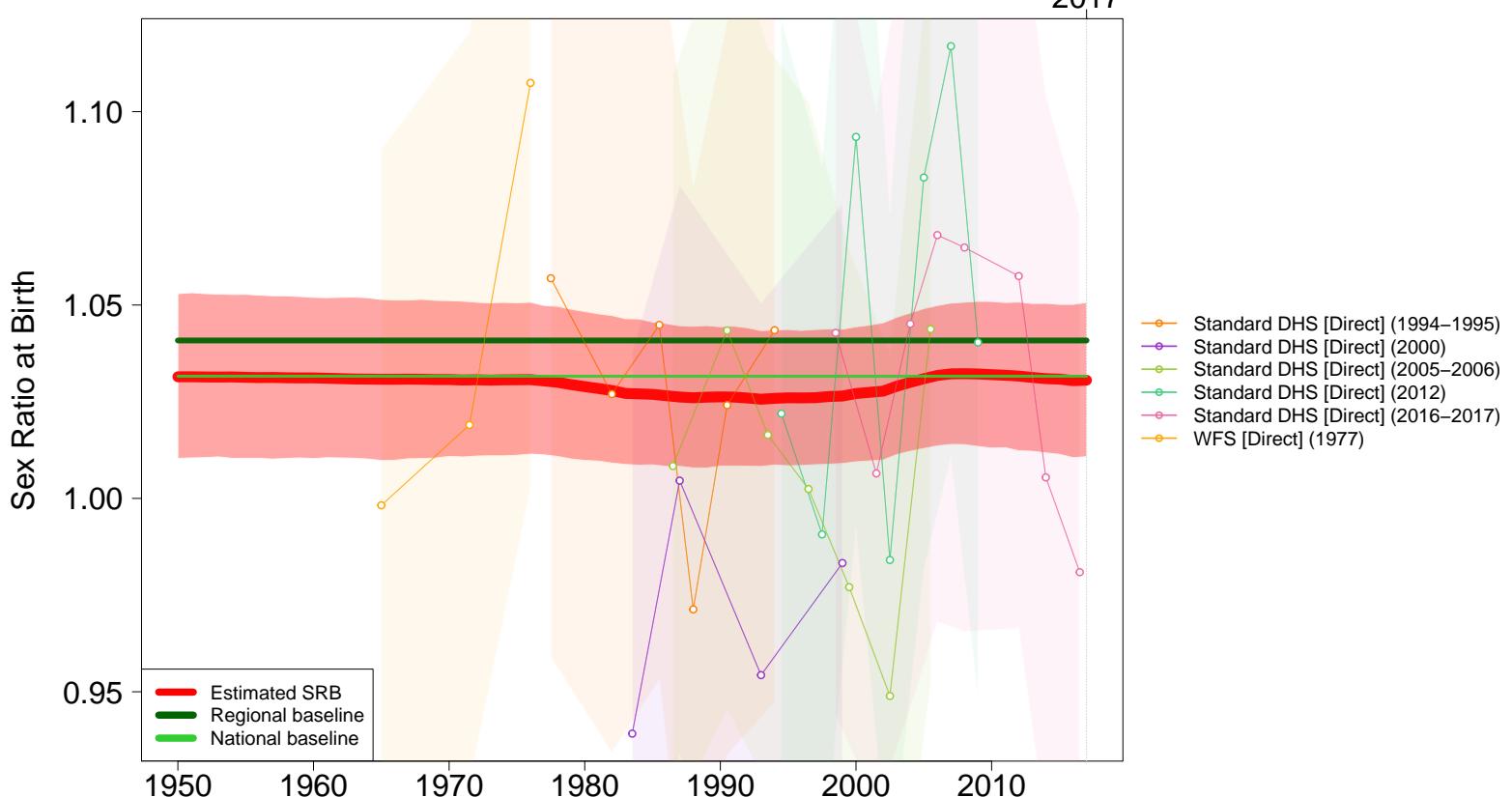
Guyana

2017



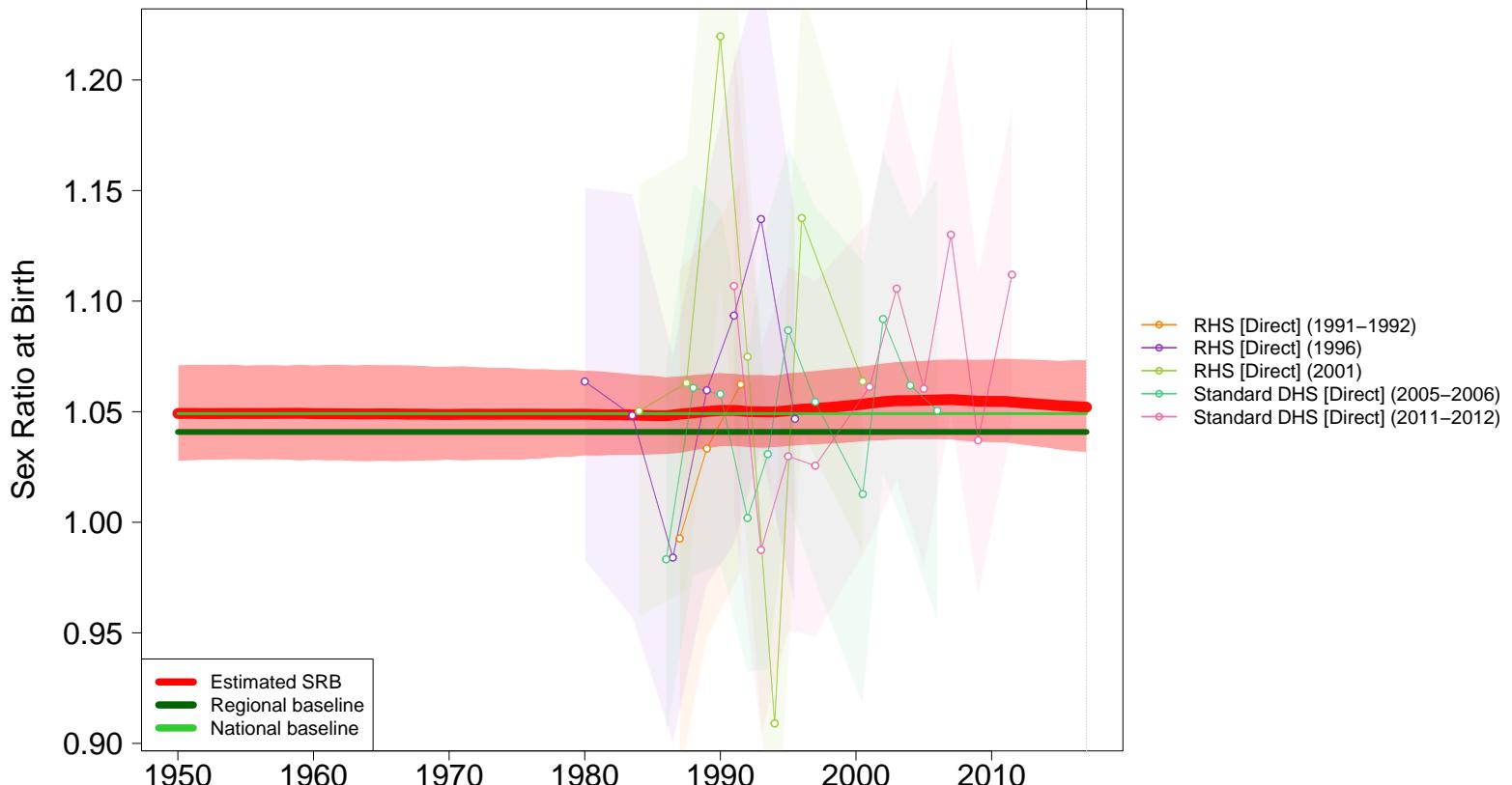
Haiti

2017



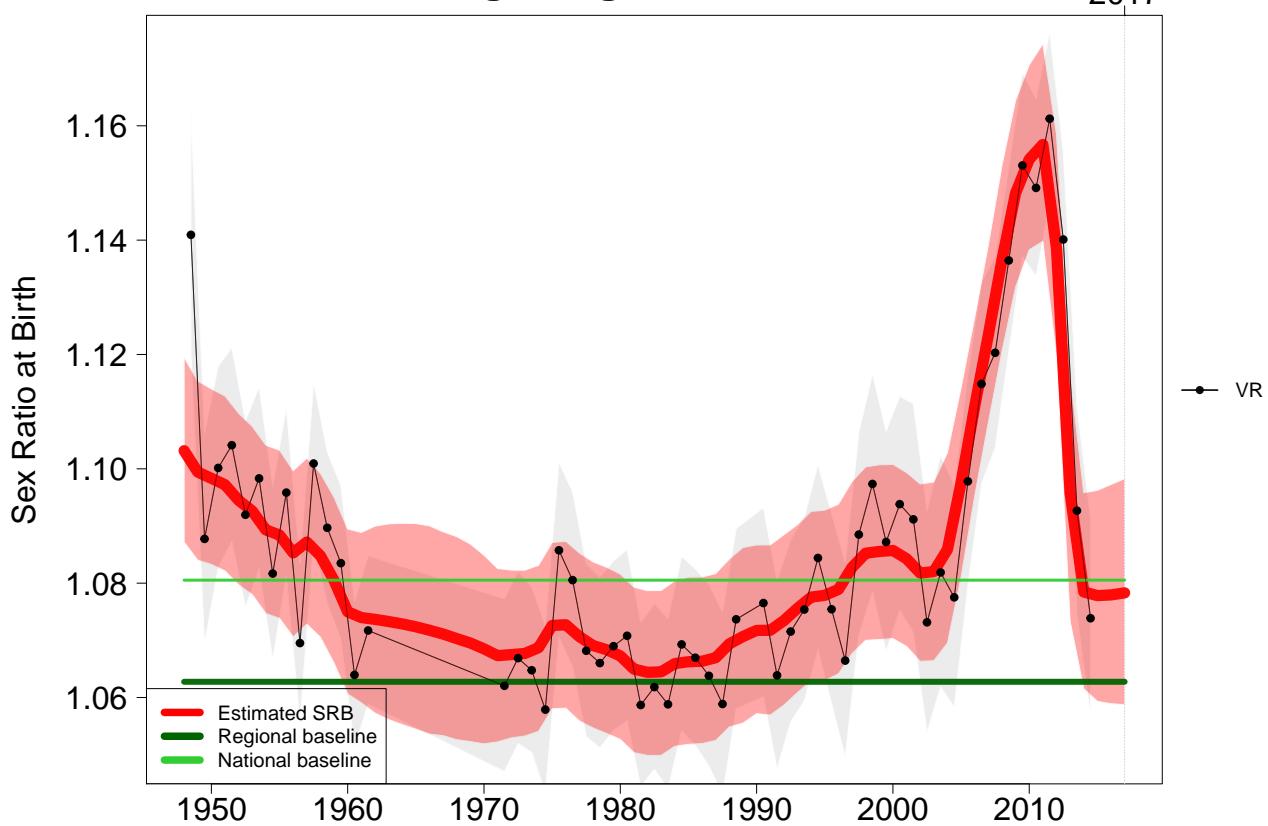
Honduras

2017



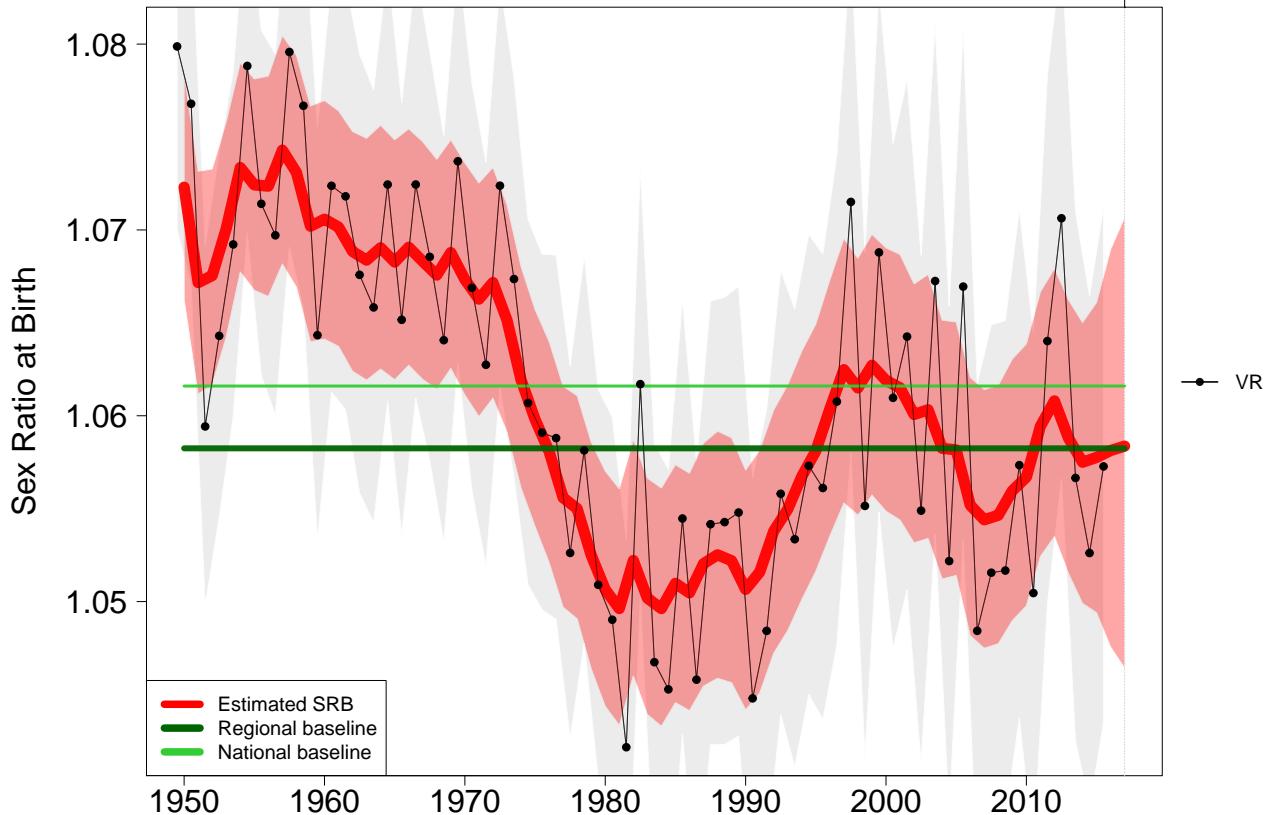
Hong Kong, SAR of China

2017



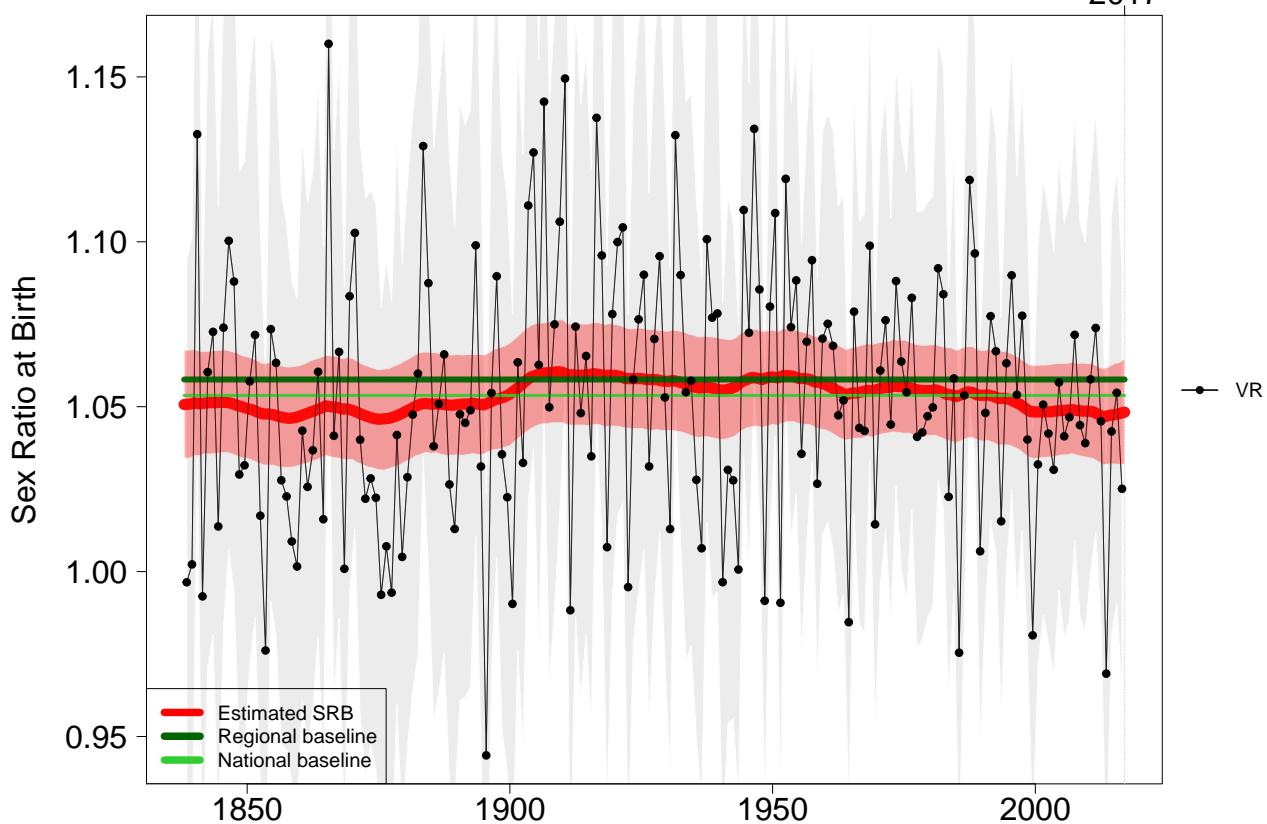
Hungary

2017



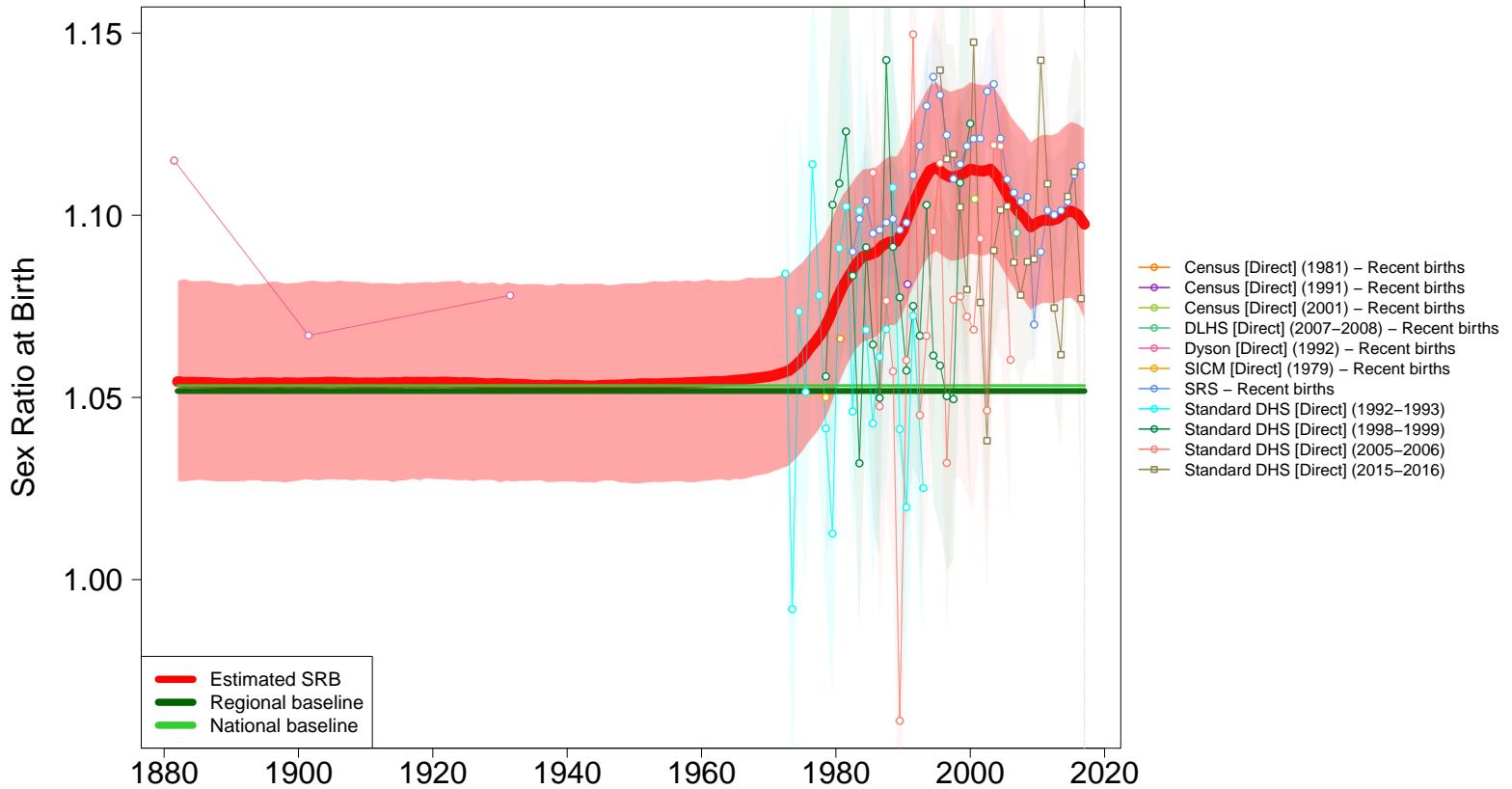
Iceland

2017



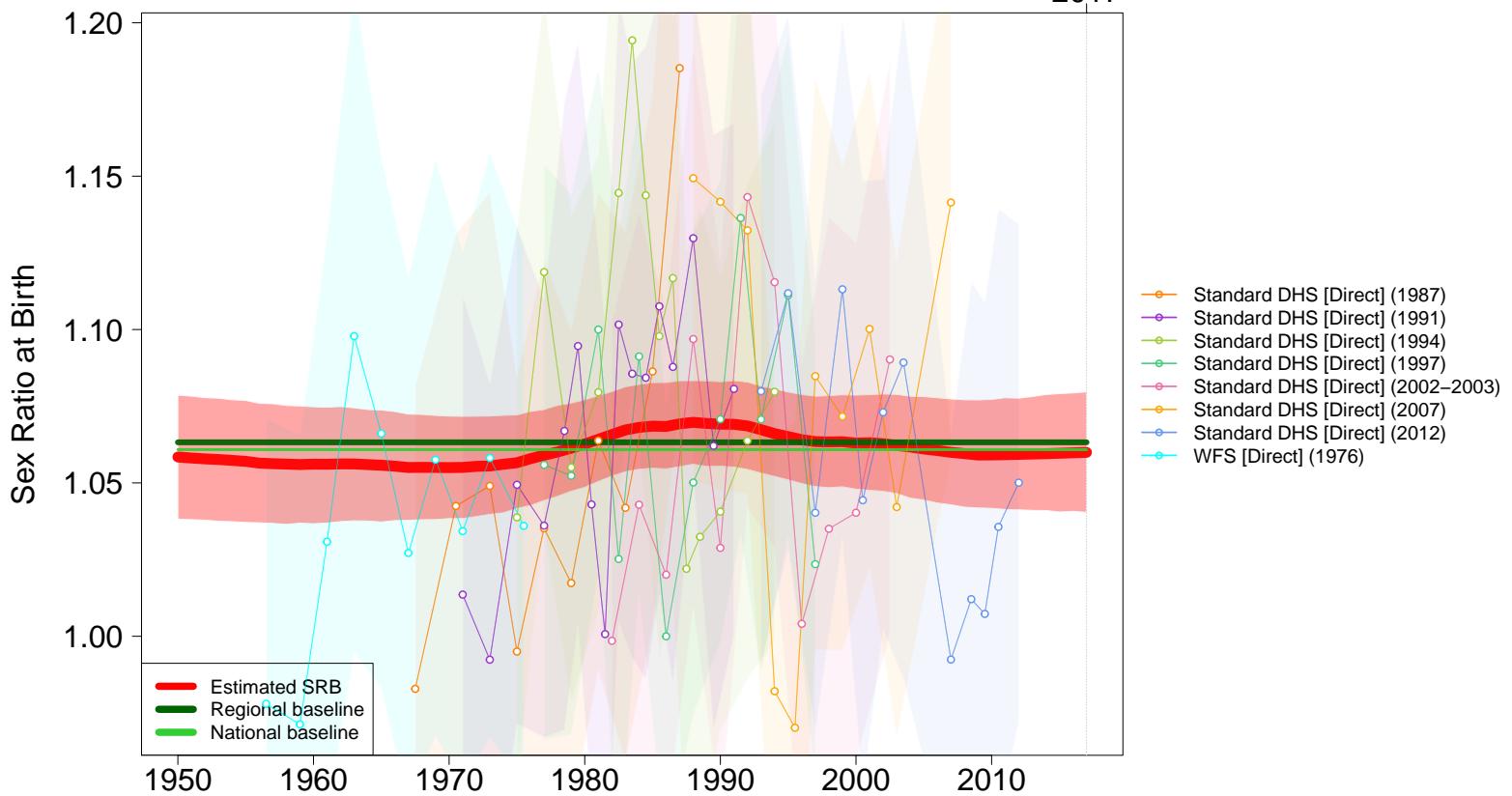
India

2017



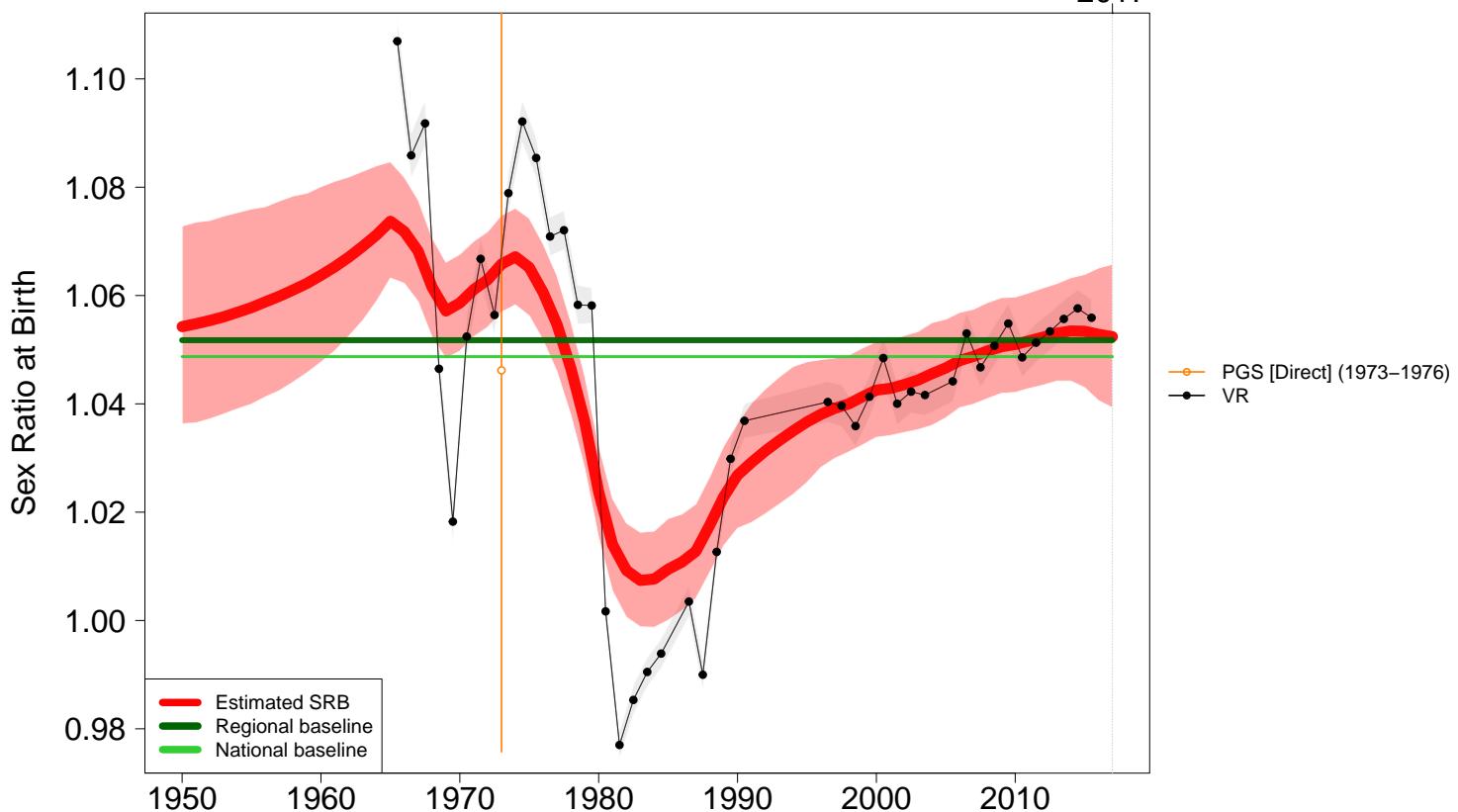
Indonesia

2017



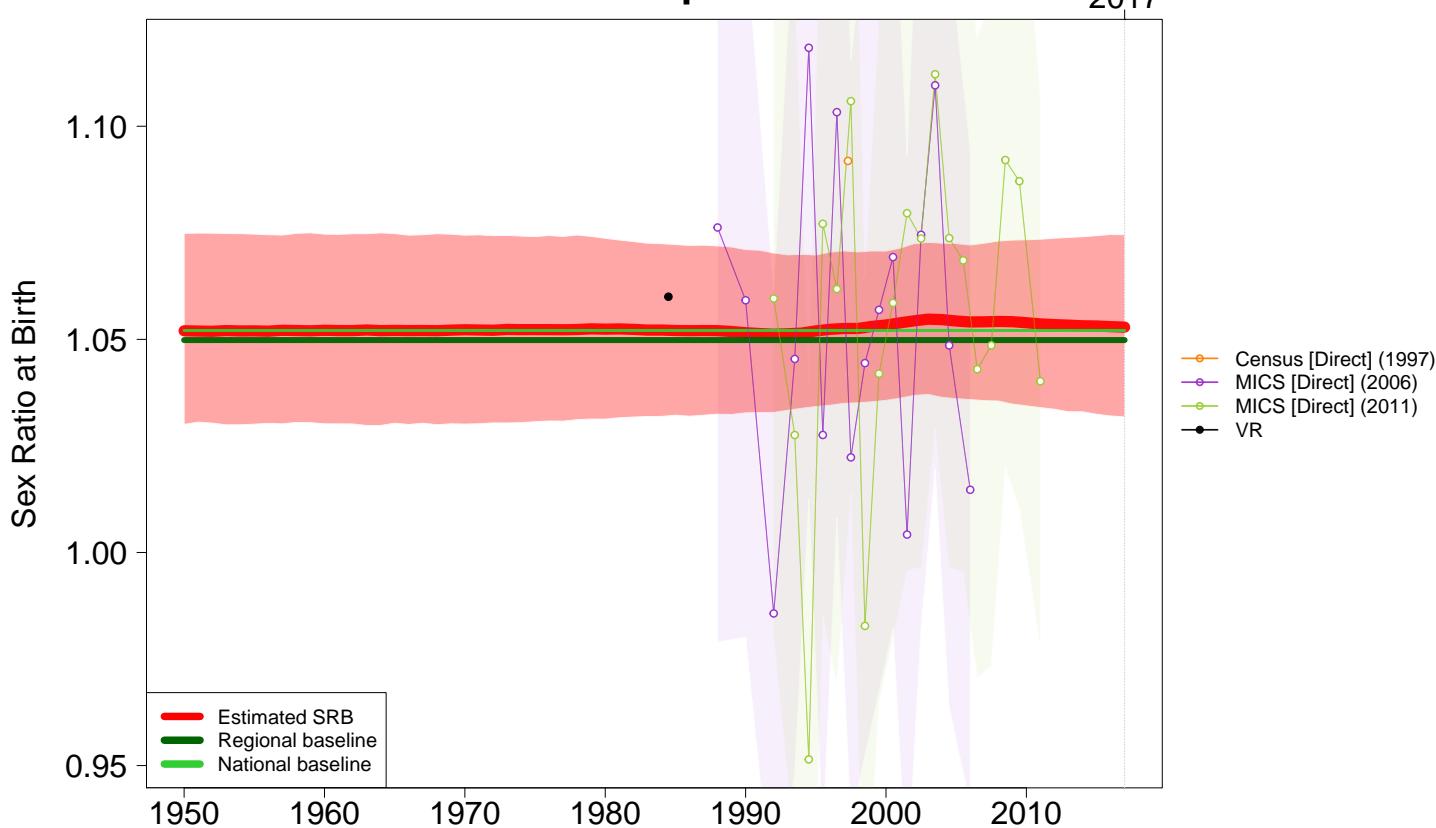
Iran (Islamic Republic of)

2017



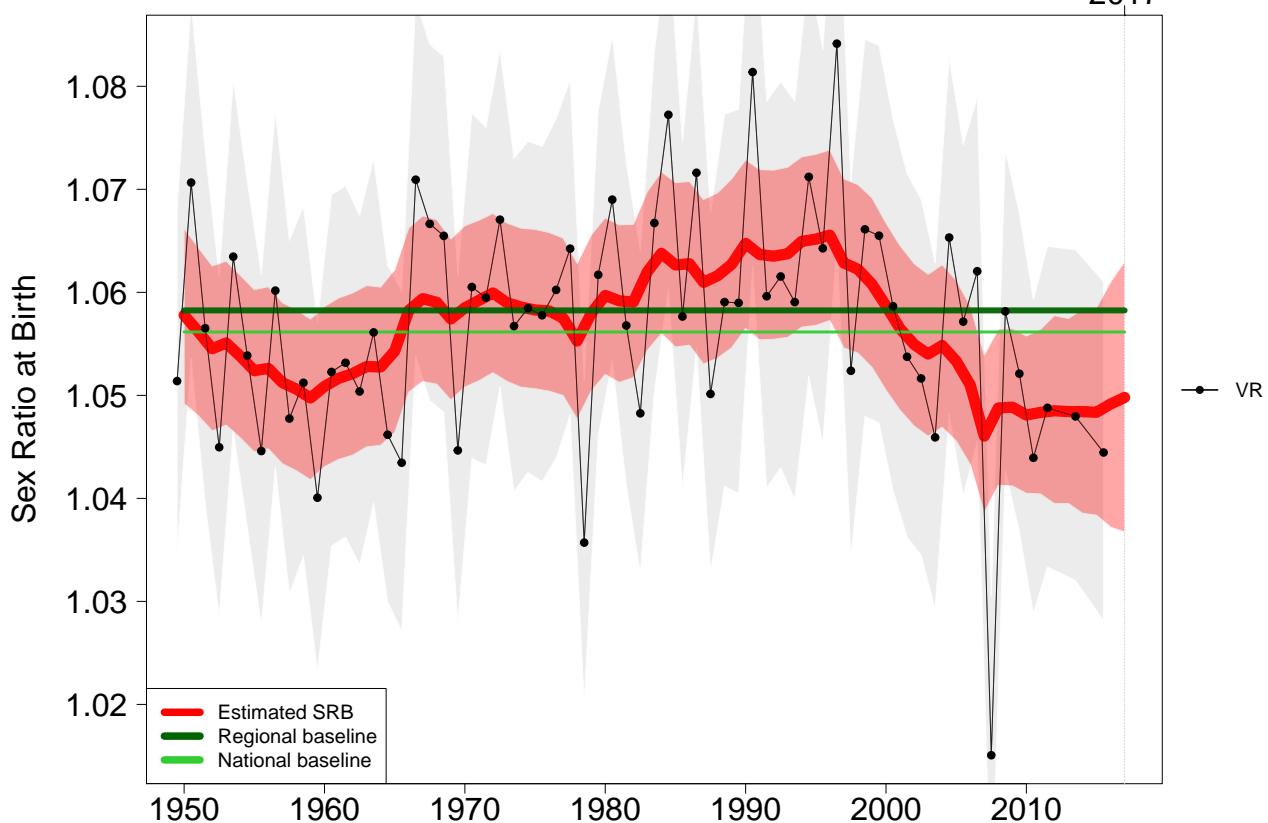
Iraq

2017



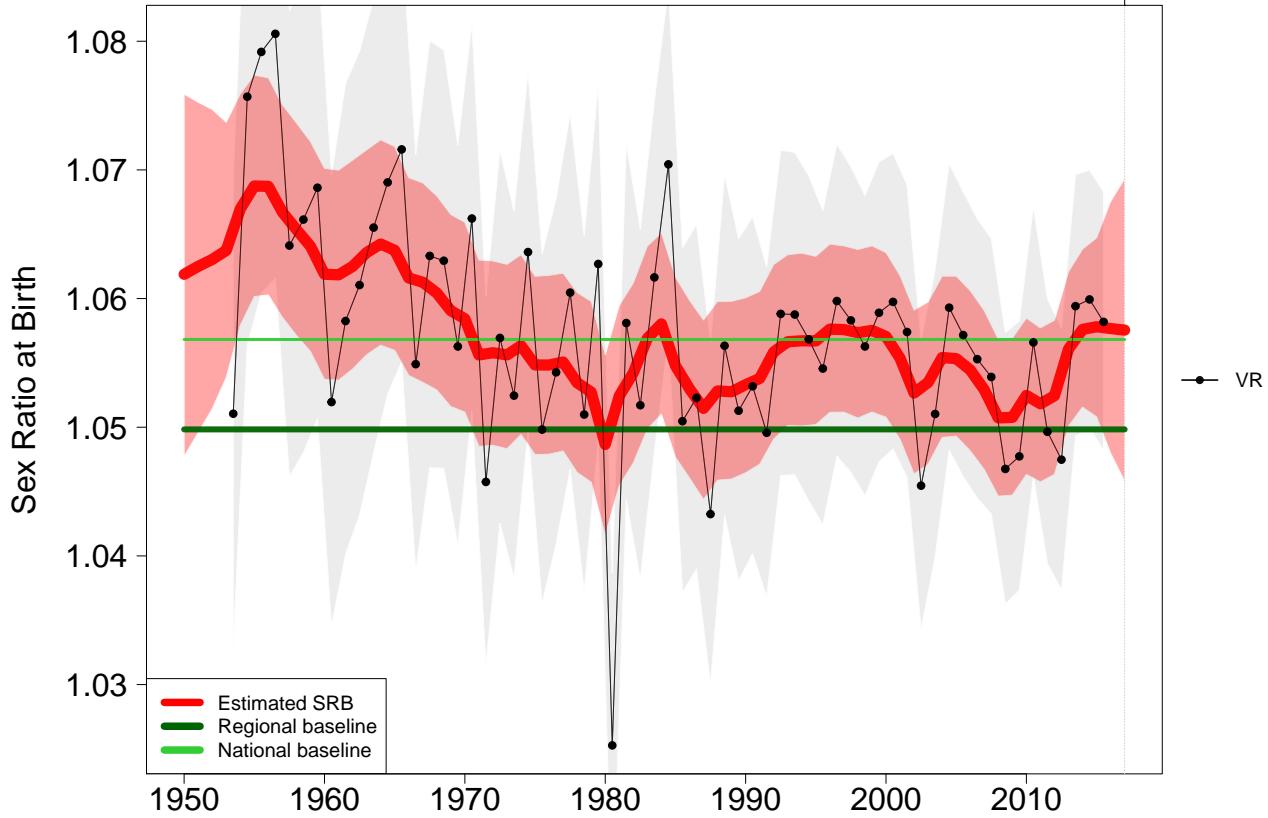
Ireland

2017



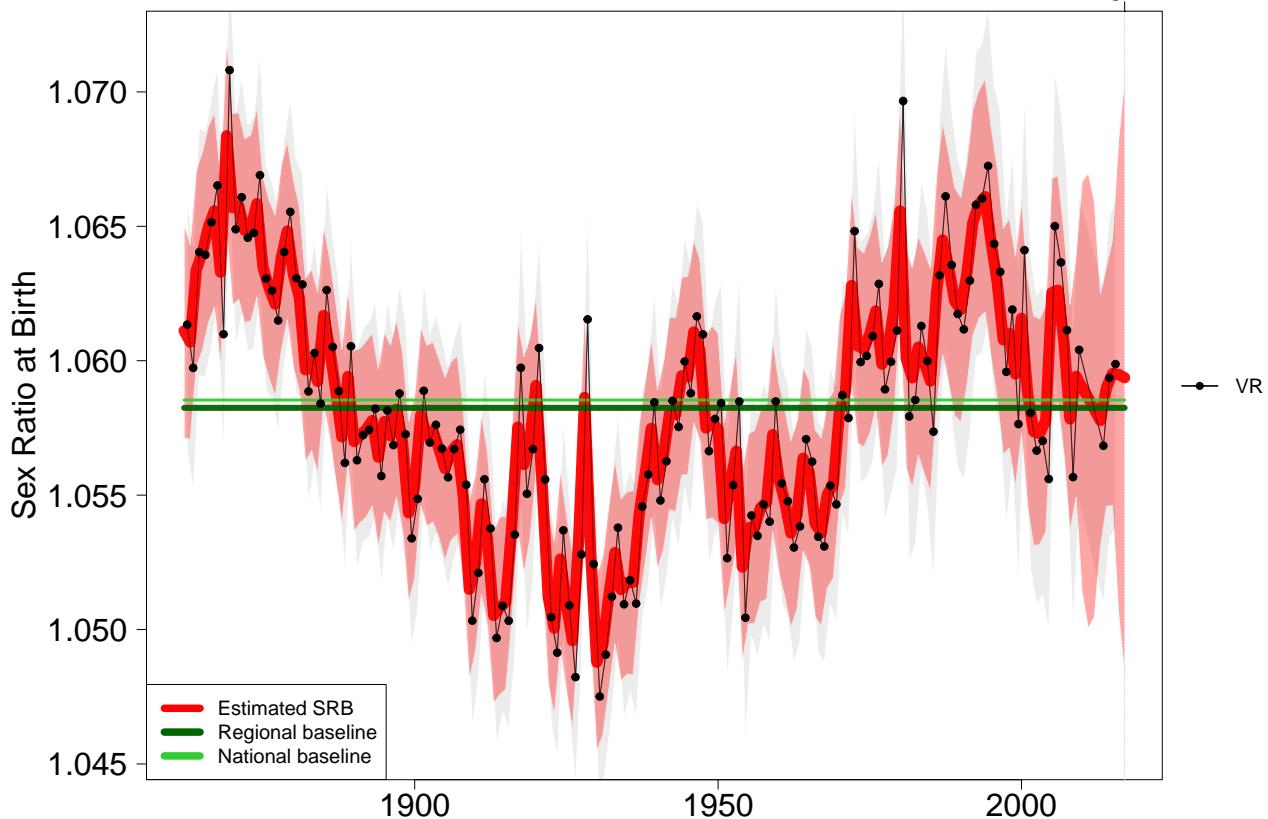
Israel

2017



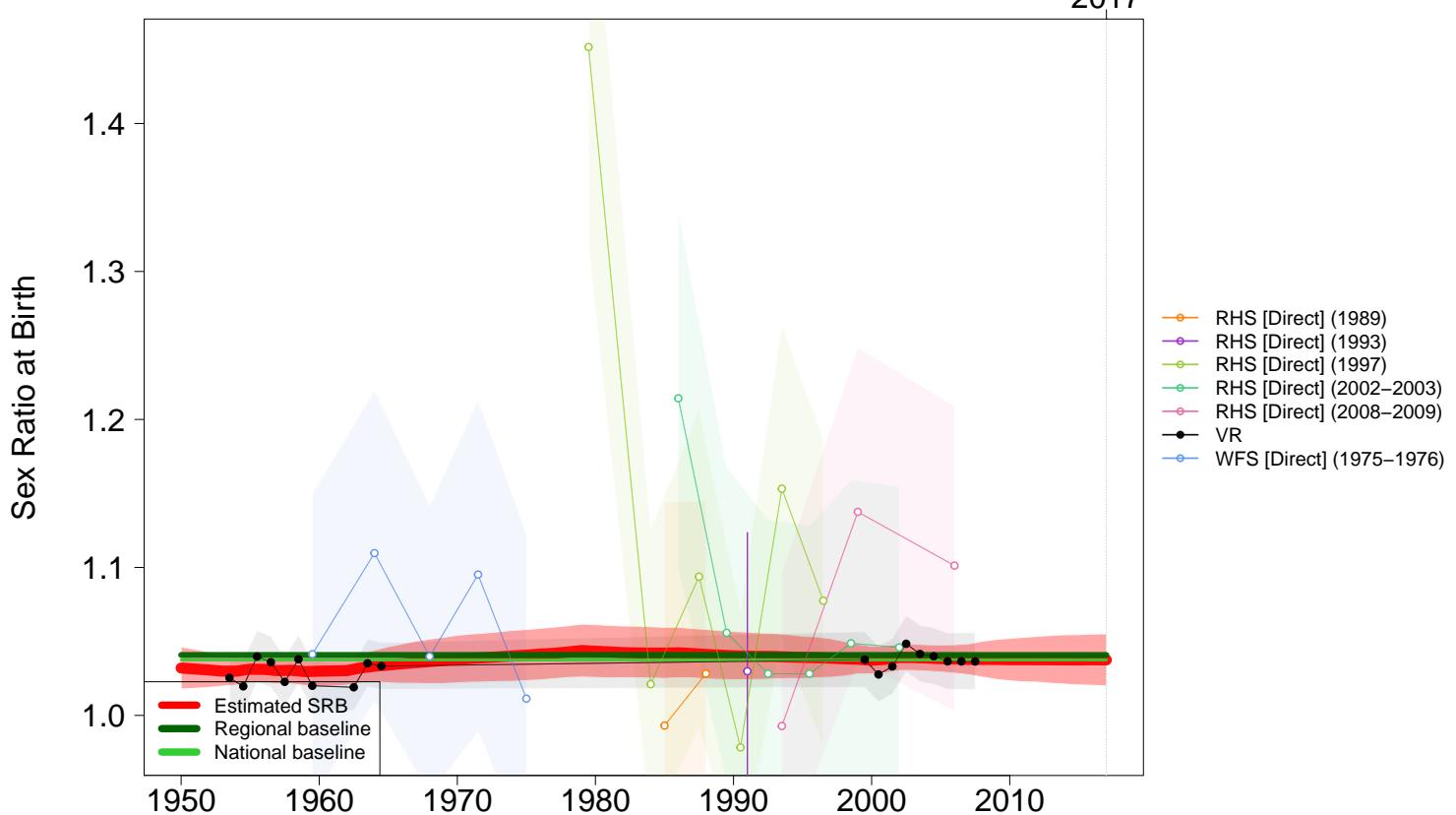
Italy

2017



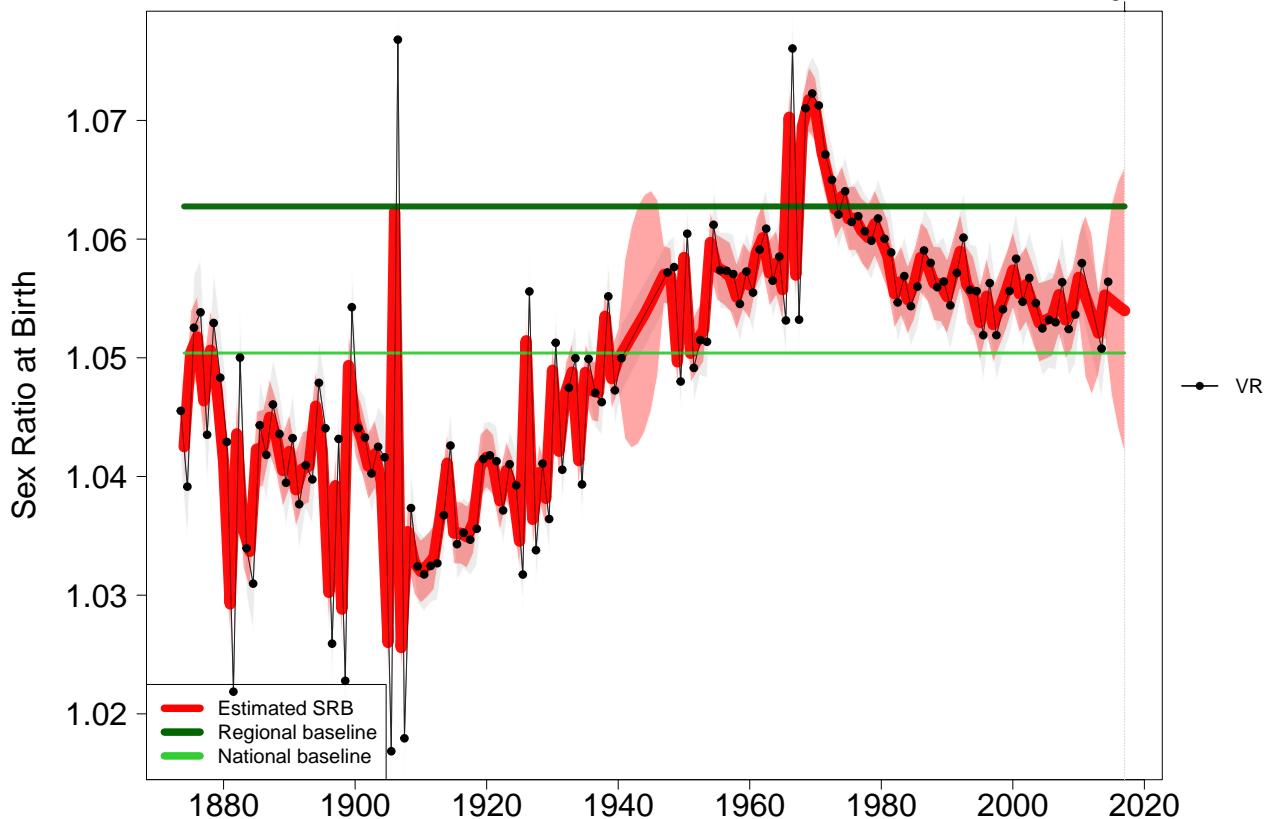
Jamaica

2017



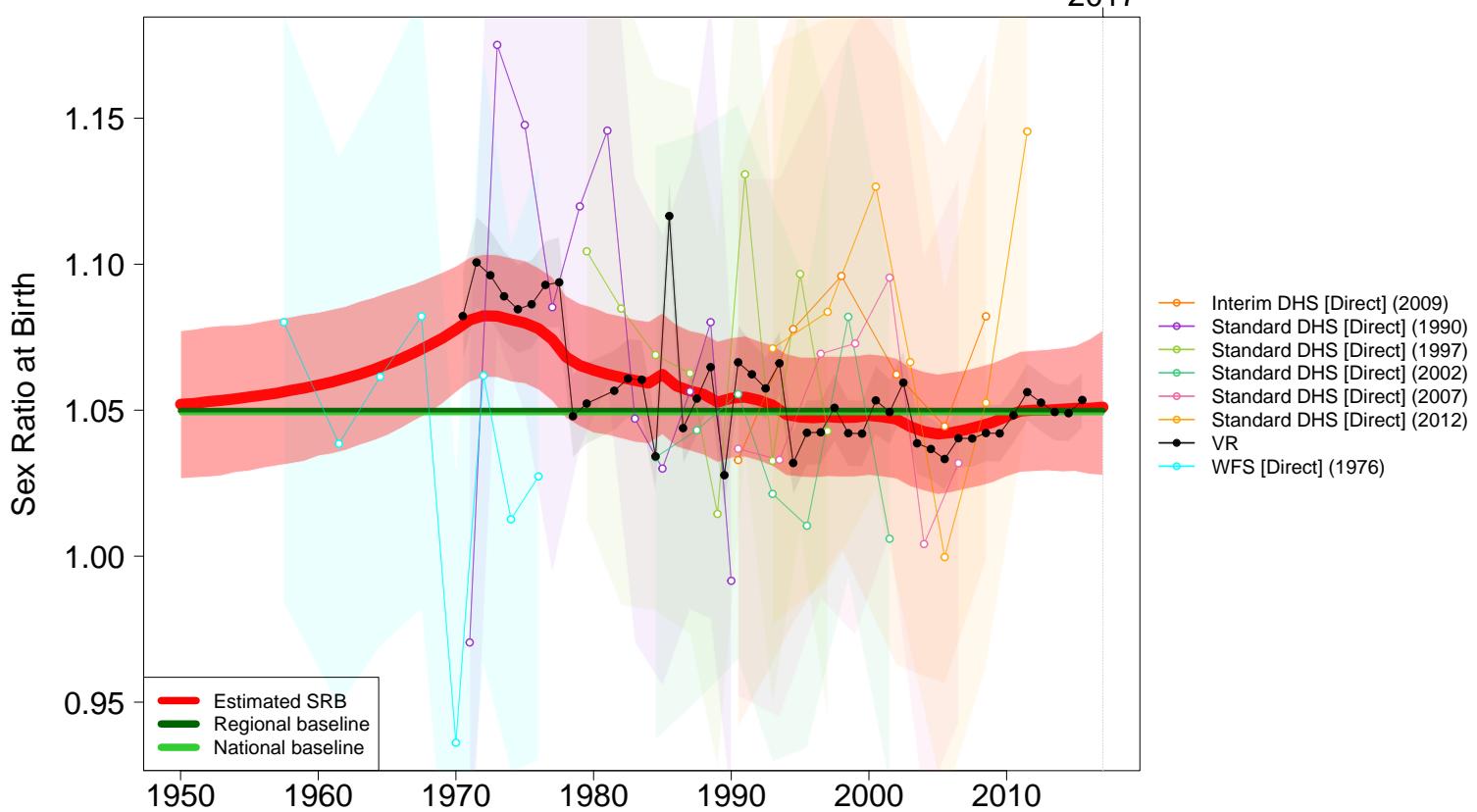
Japan

2017



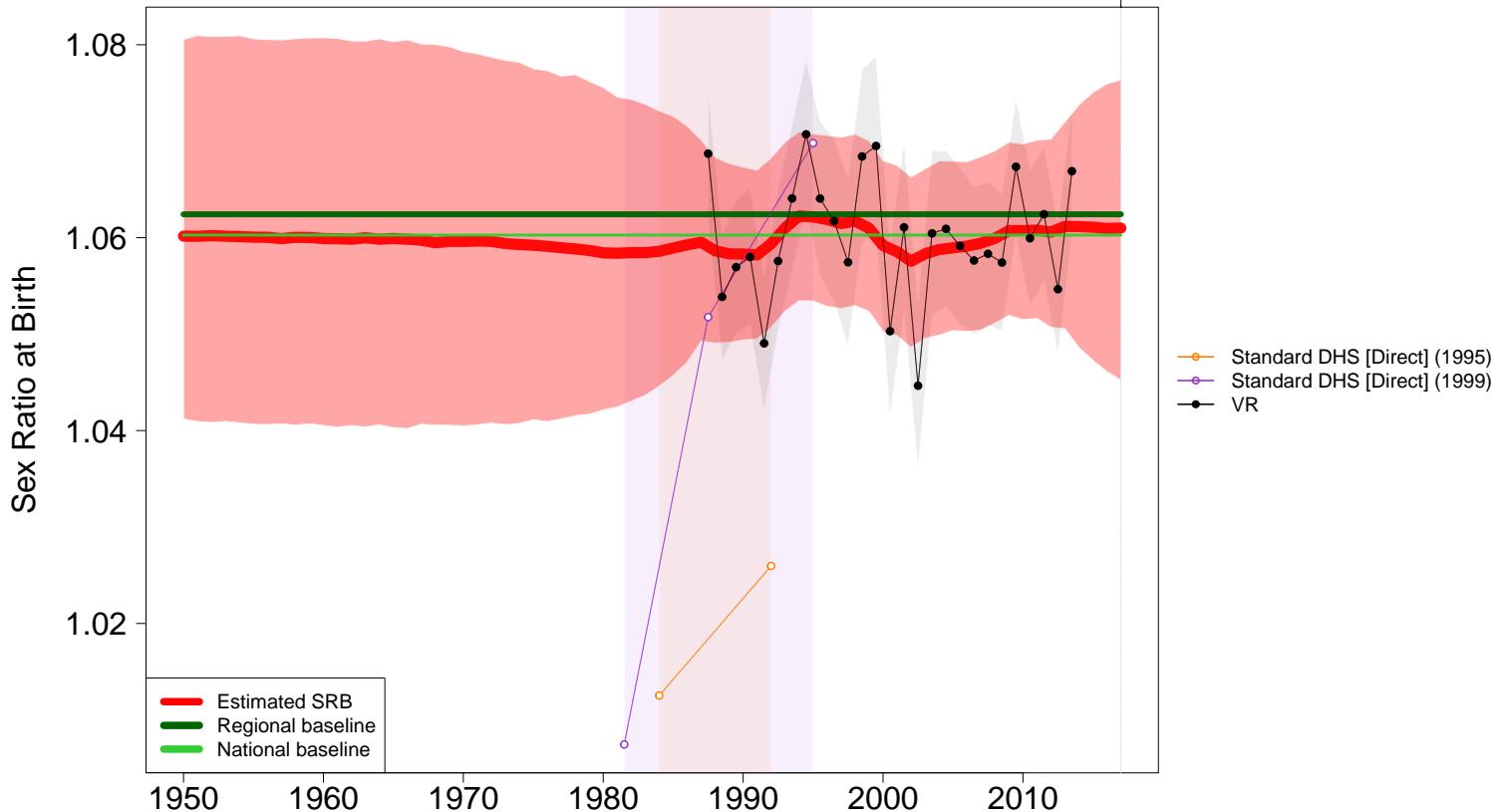
Jordan

2017



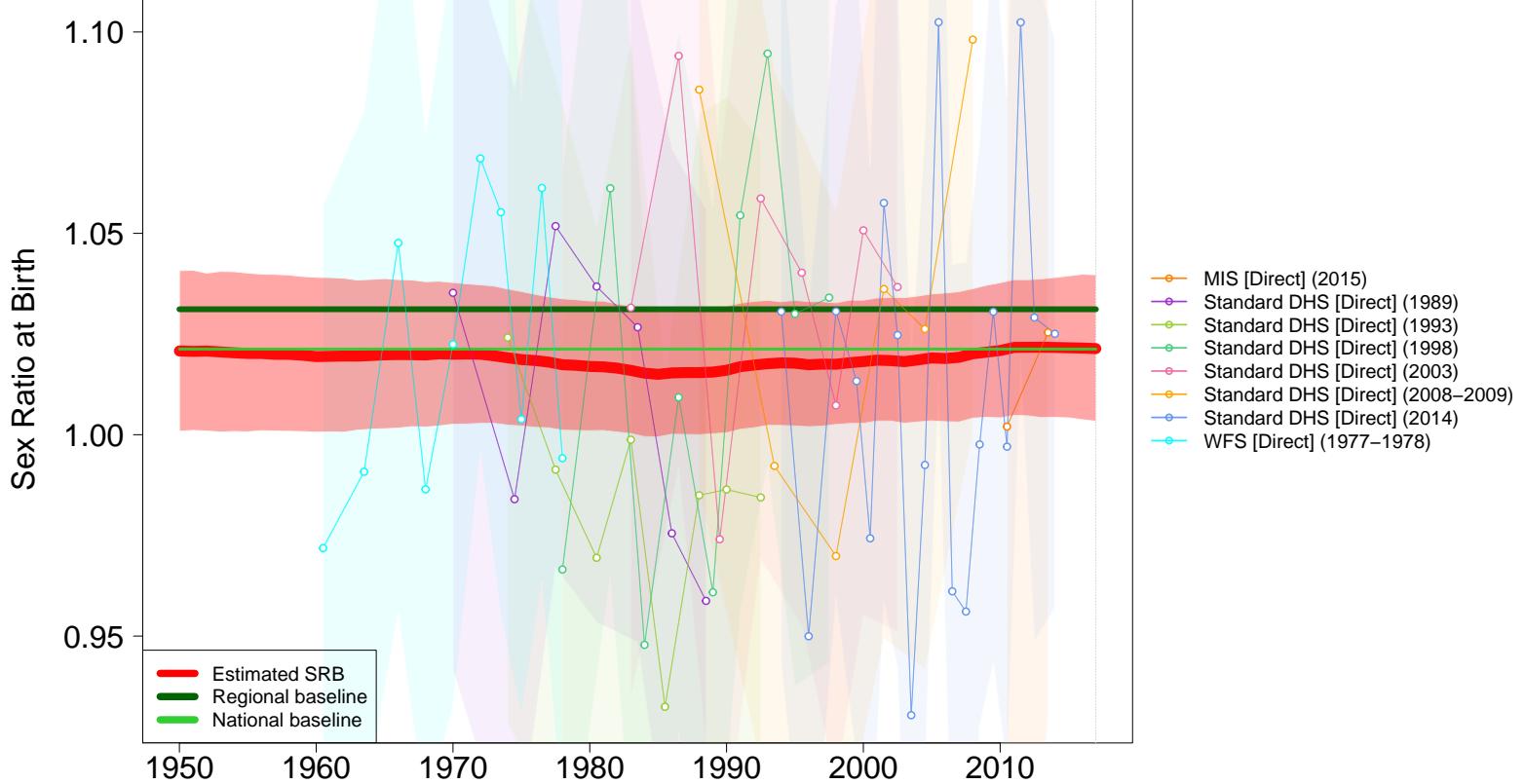
Kazakhstan

2017



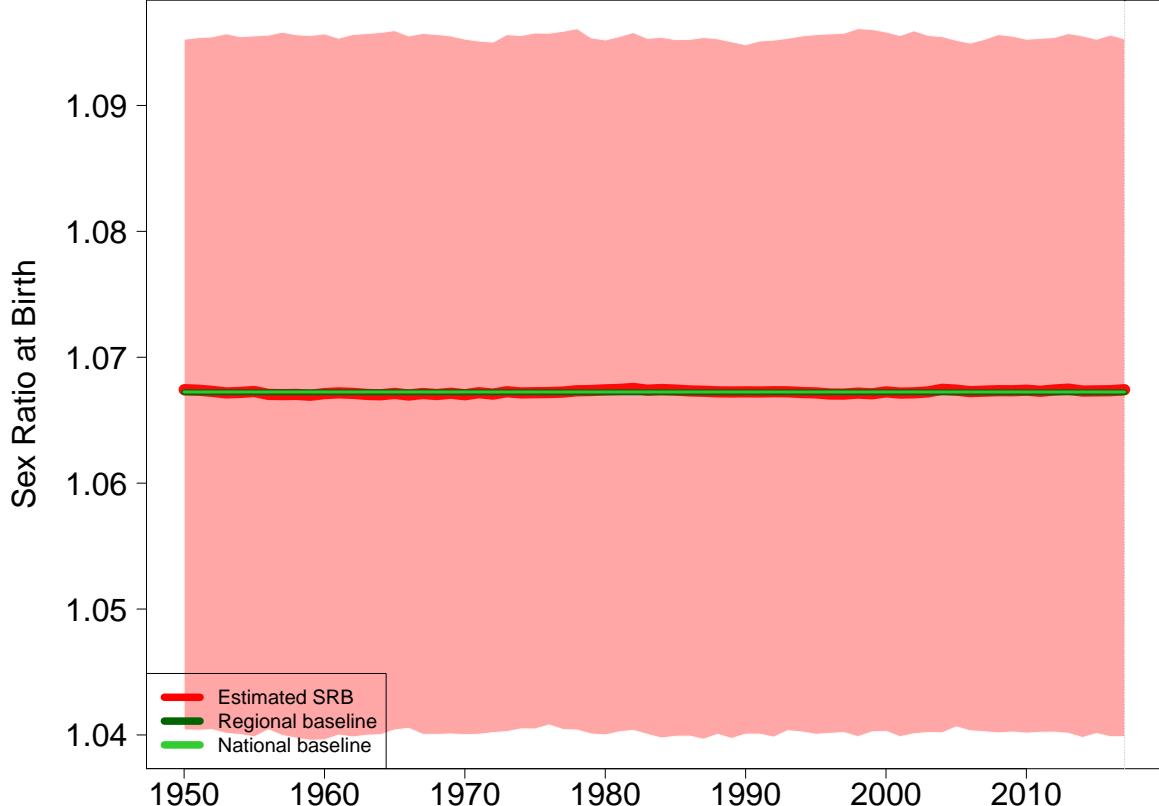
Kenya

2017



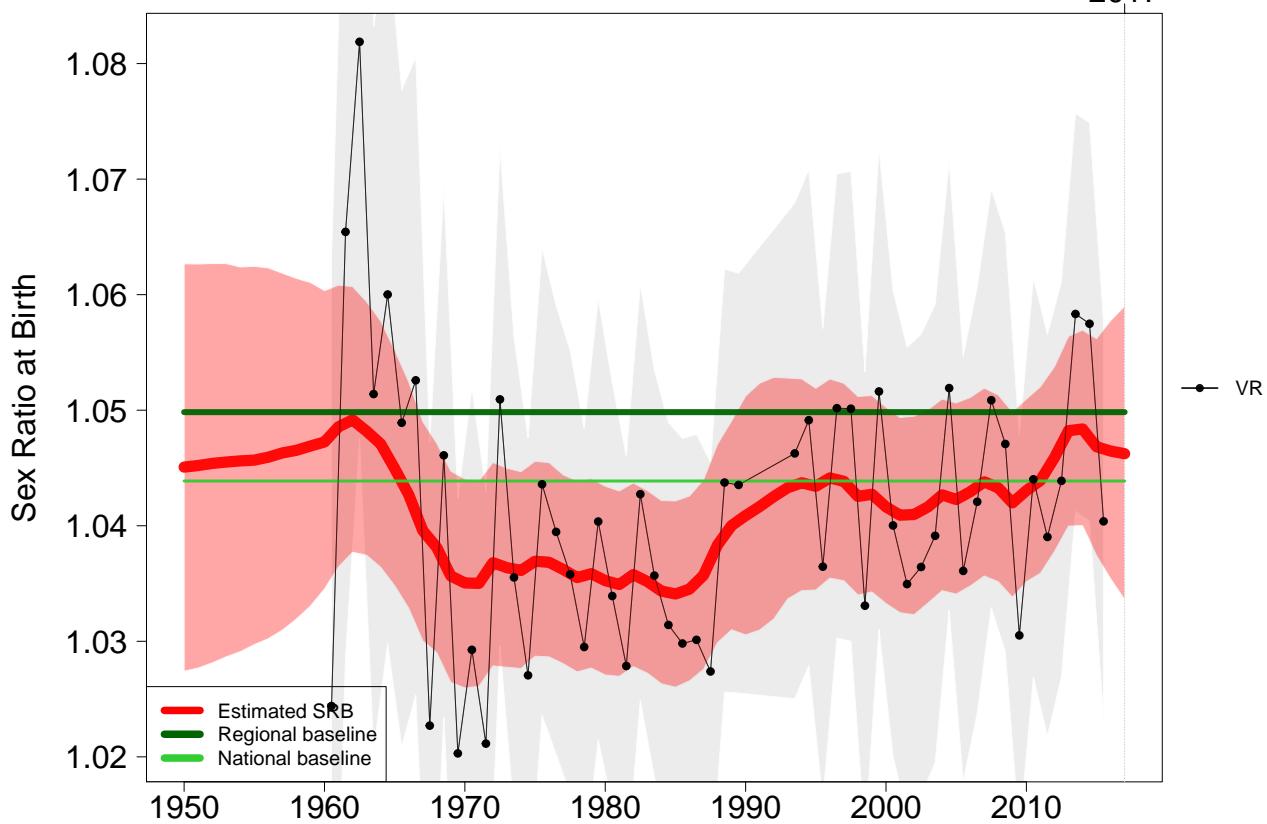
Kiribati

2017



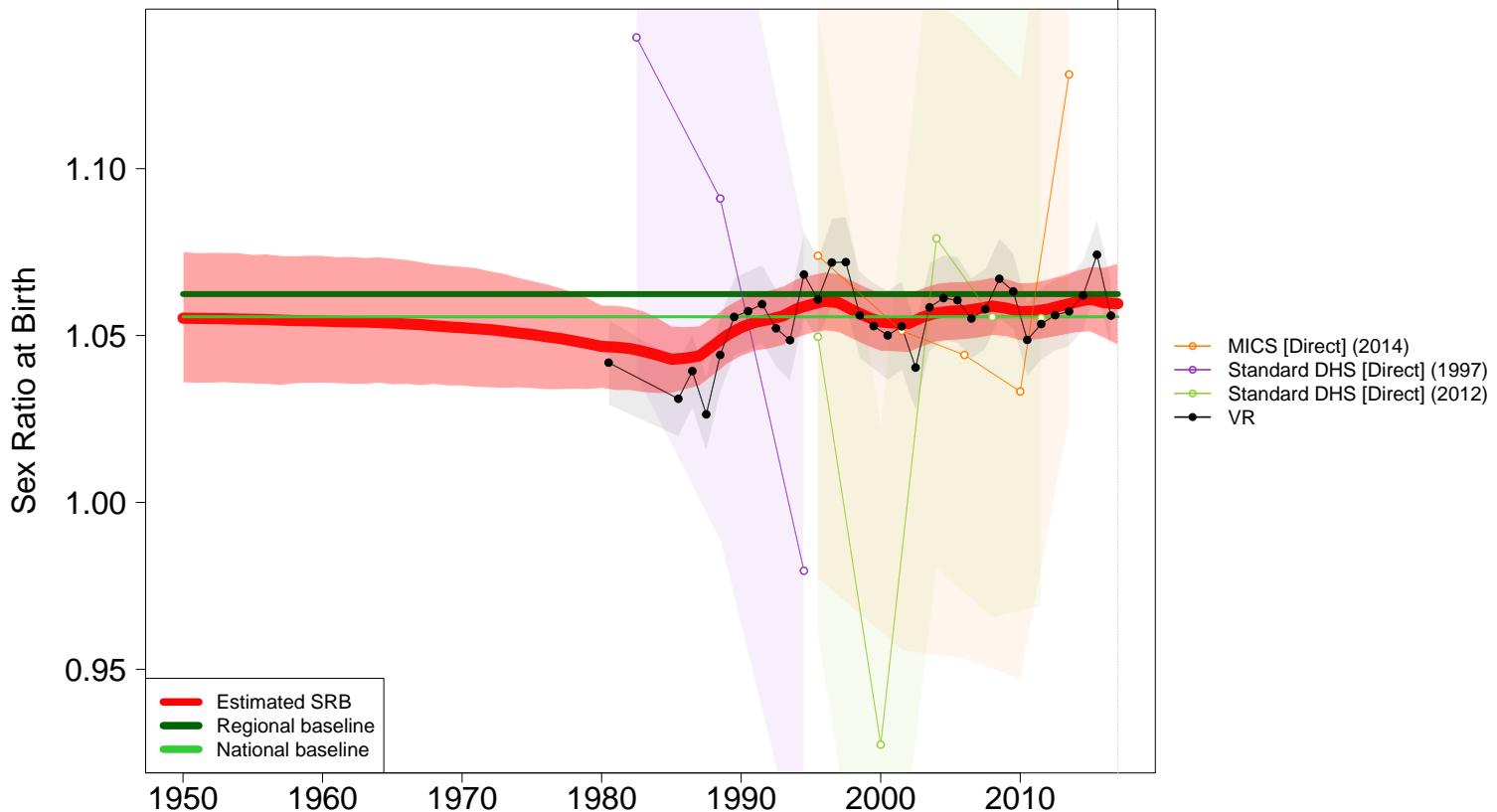
Kuwait

2017



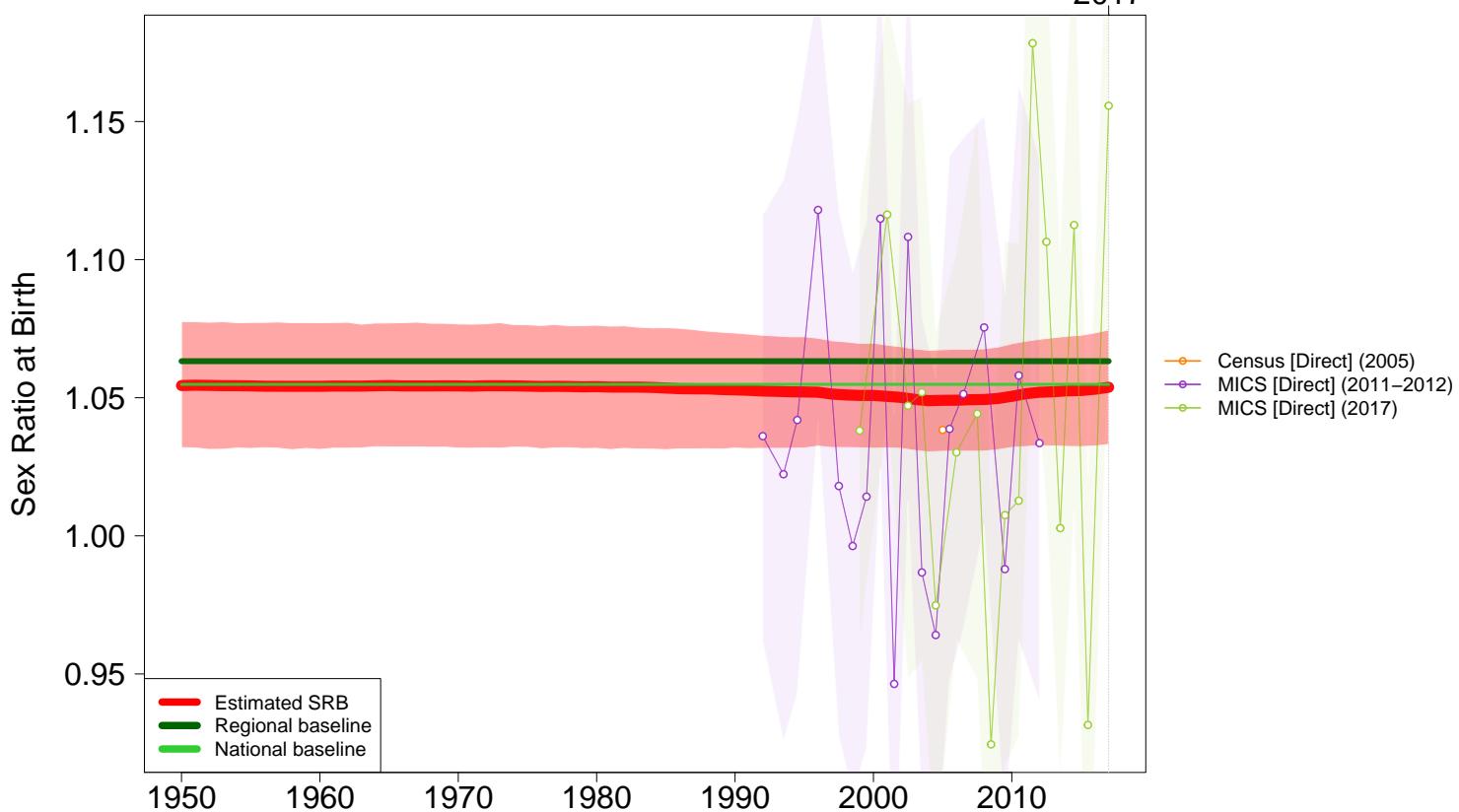
Kyrgyz Republic

2017



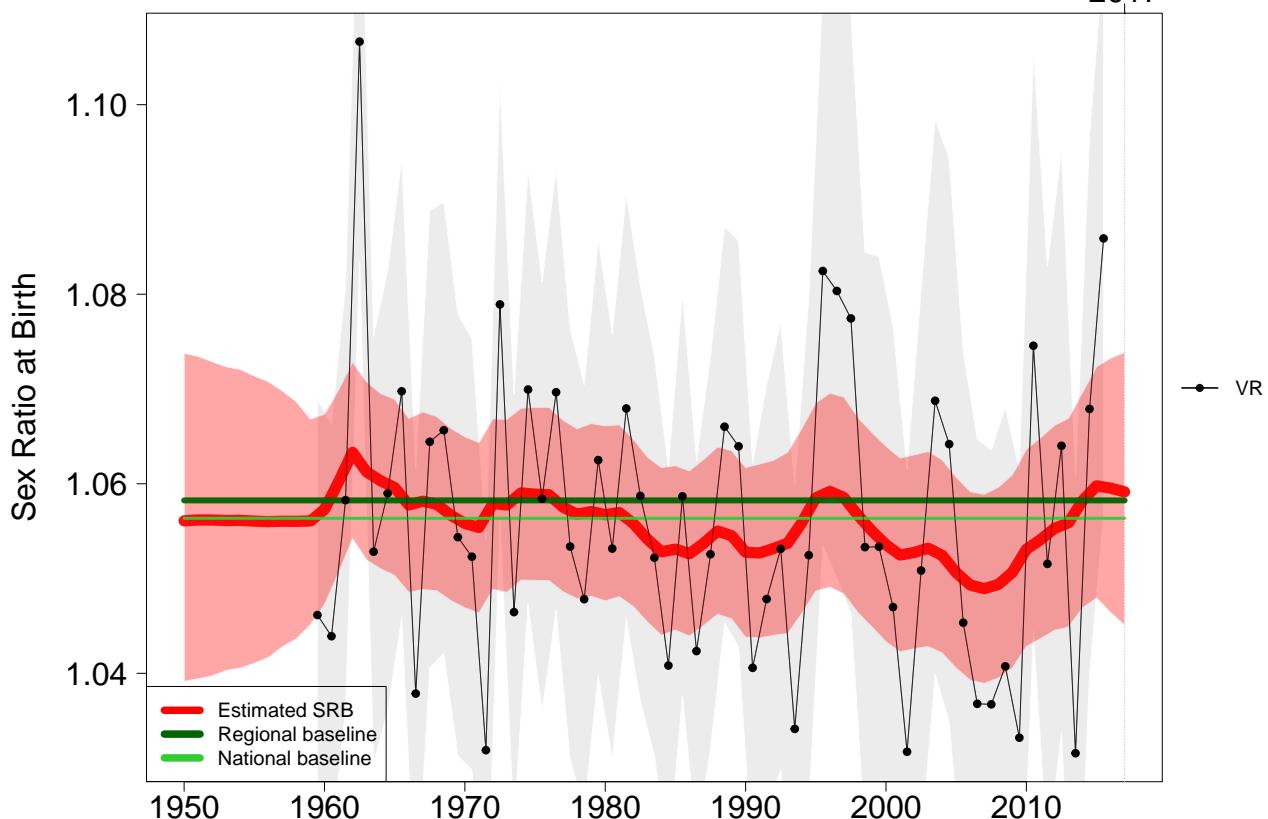
Laos

2017

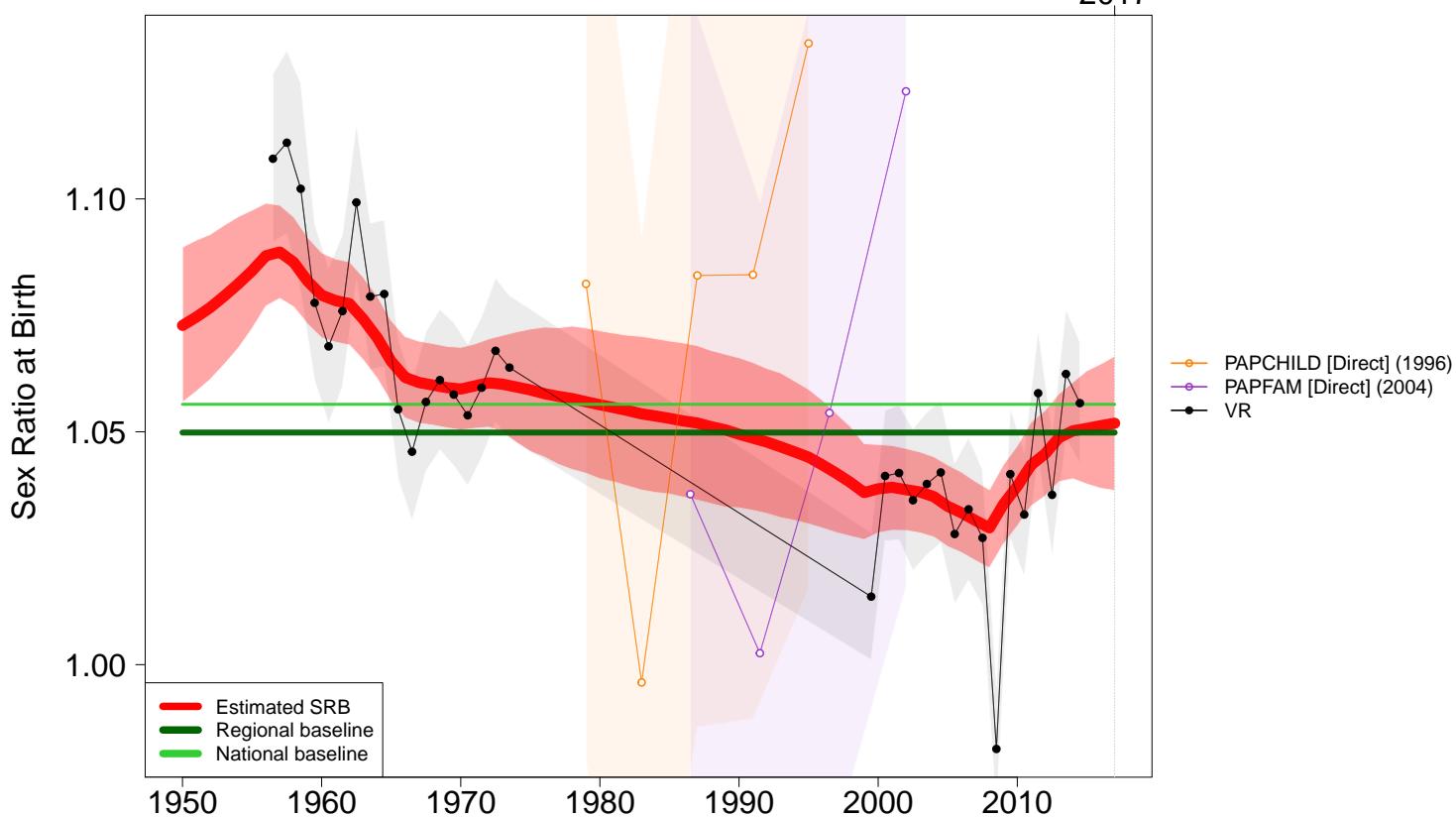


Latvia

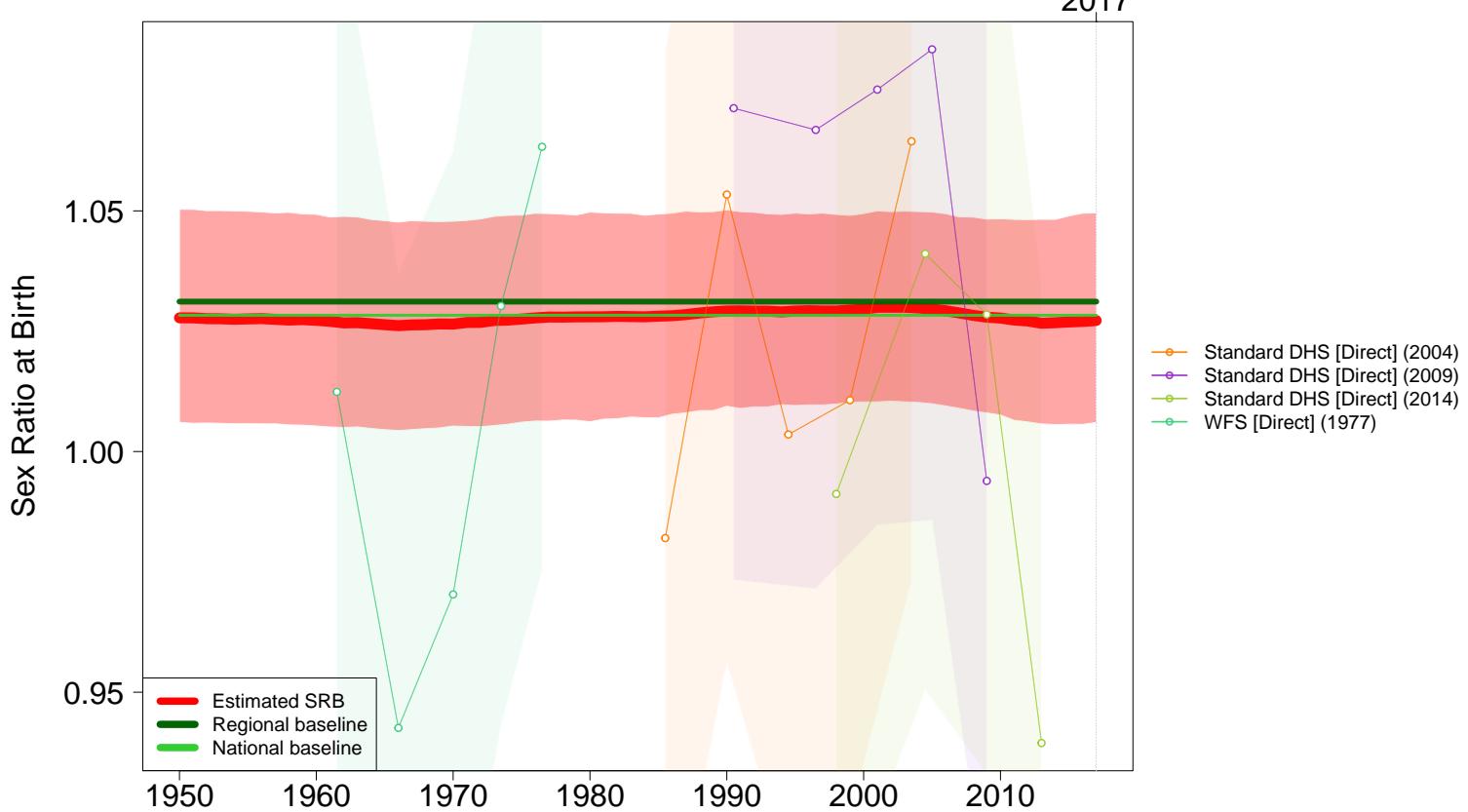
2017



Lebanon

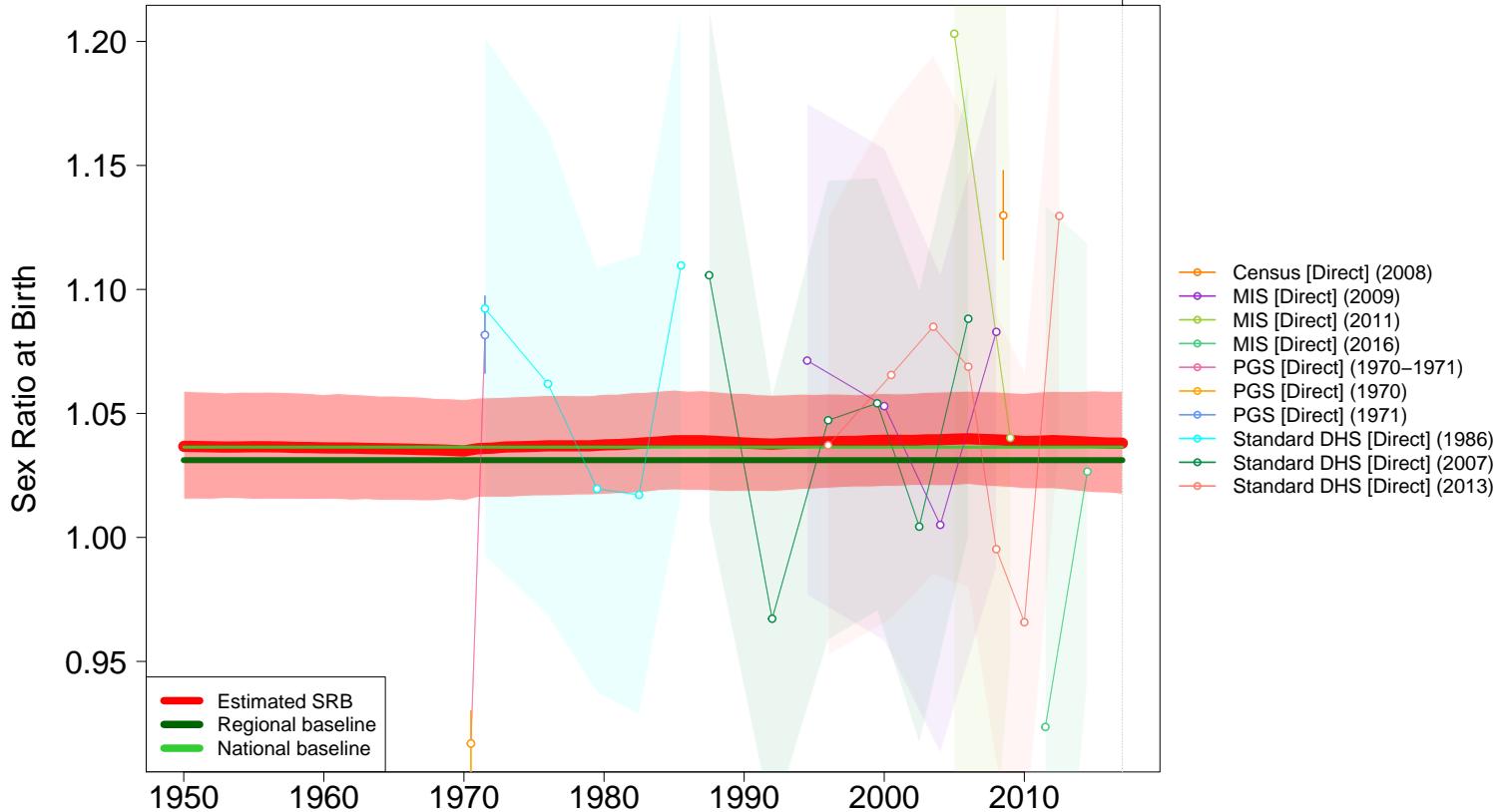


Lesotho



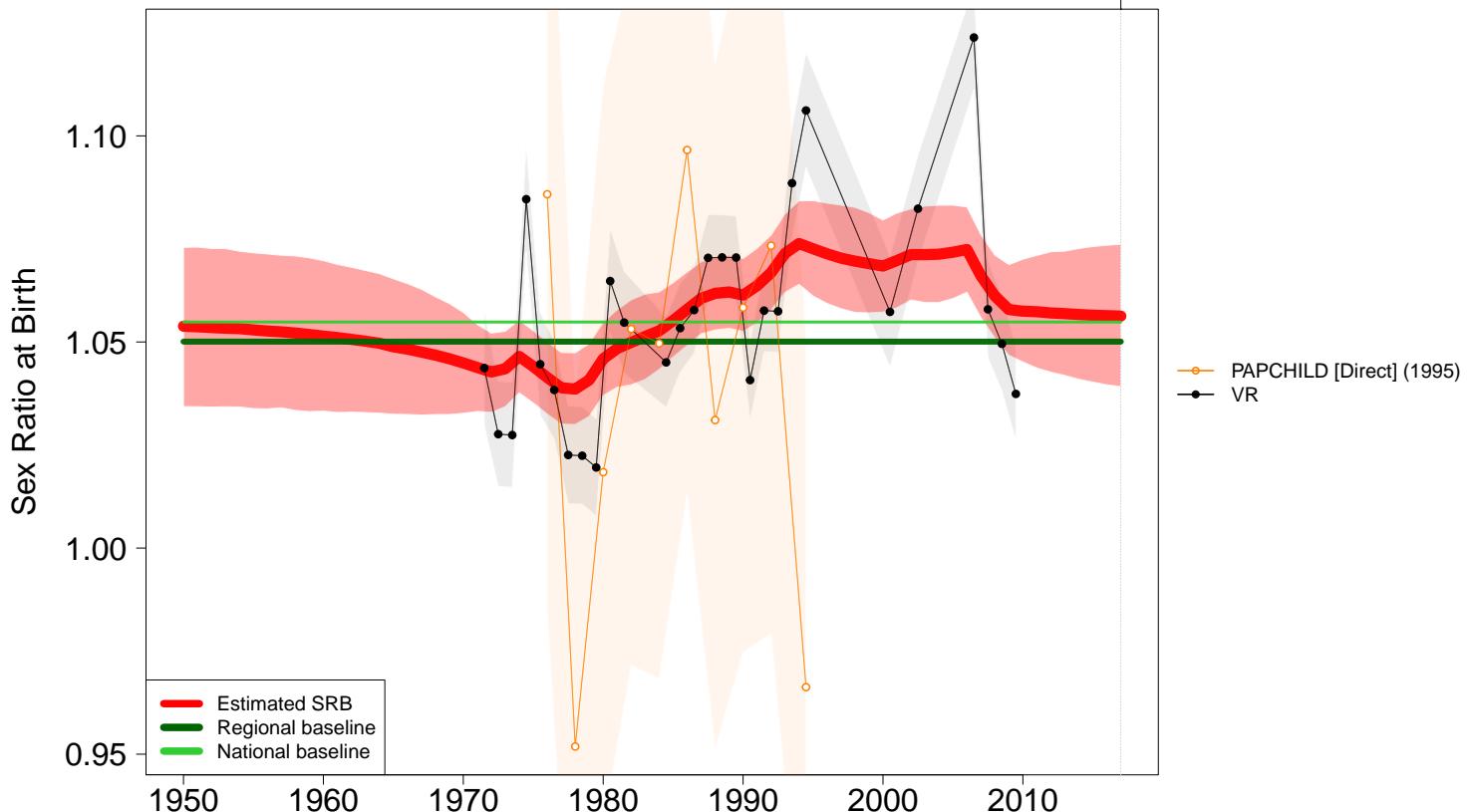
Liberia

2017



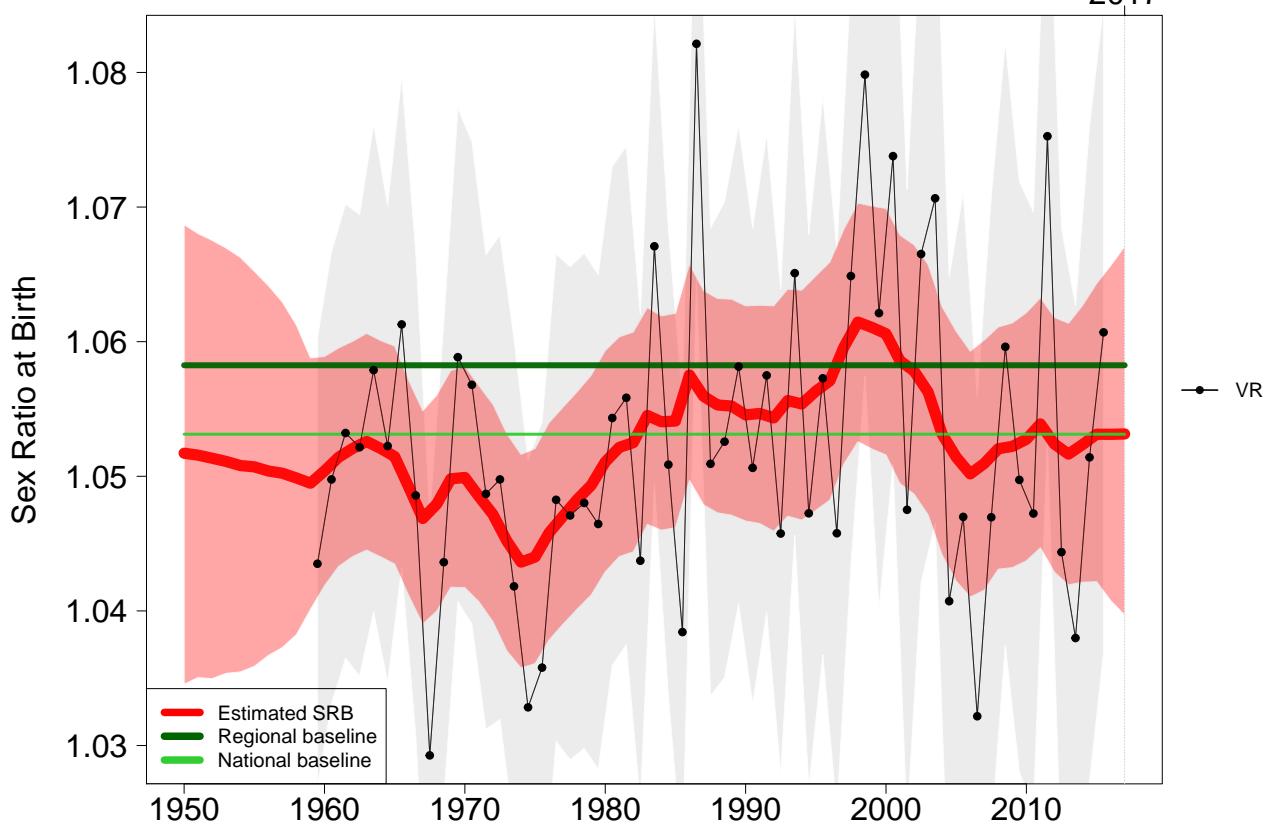
Libya

2017



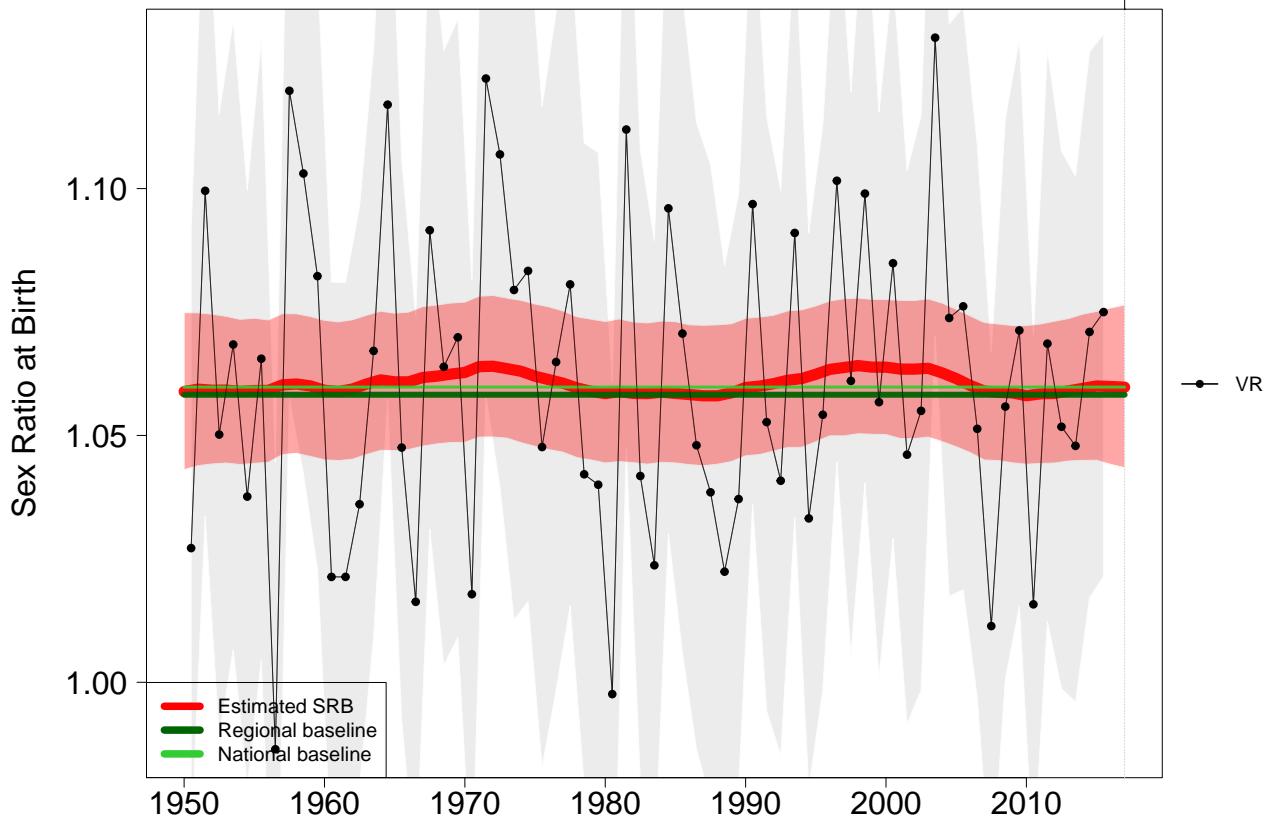
Lithuania

2017



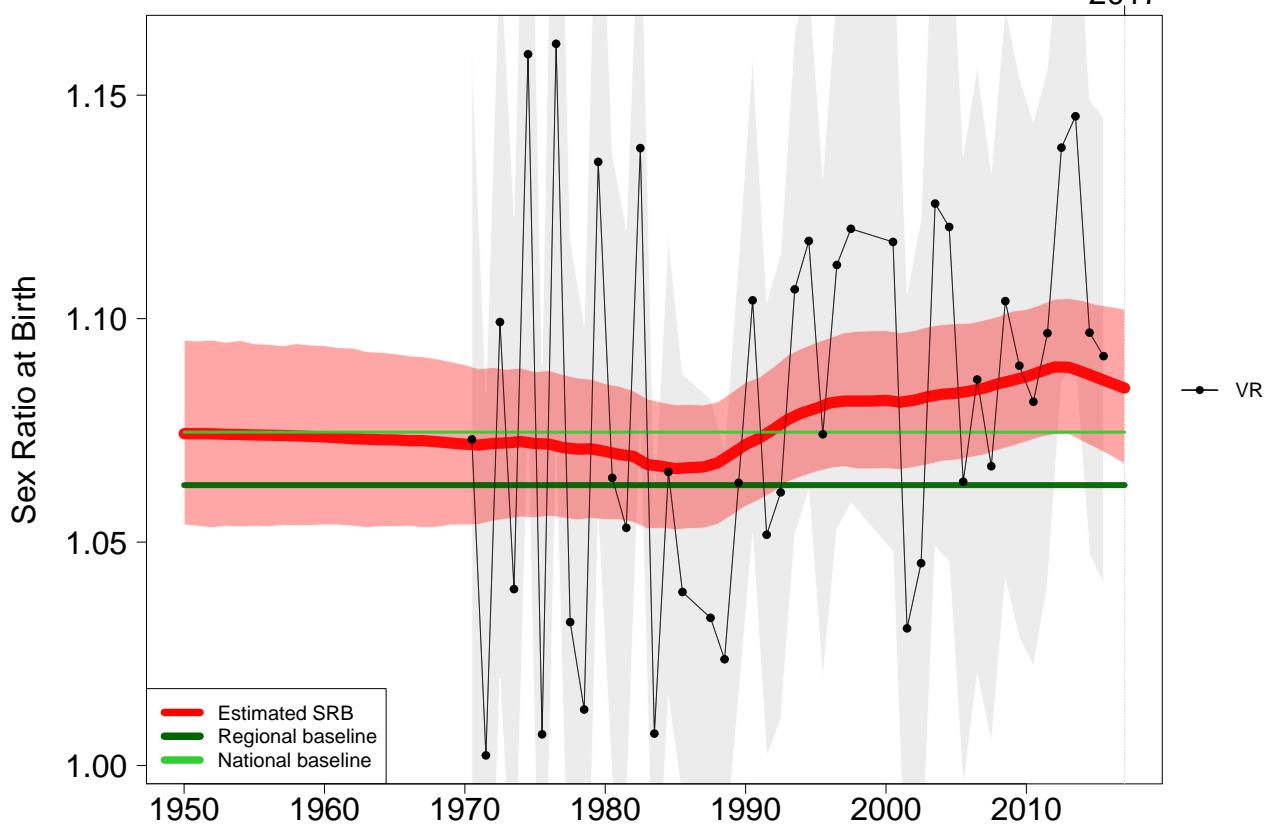
Luxembourg

2017



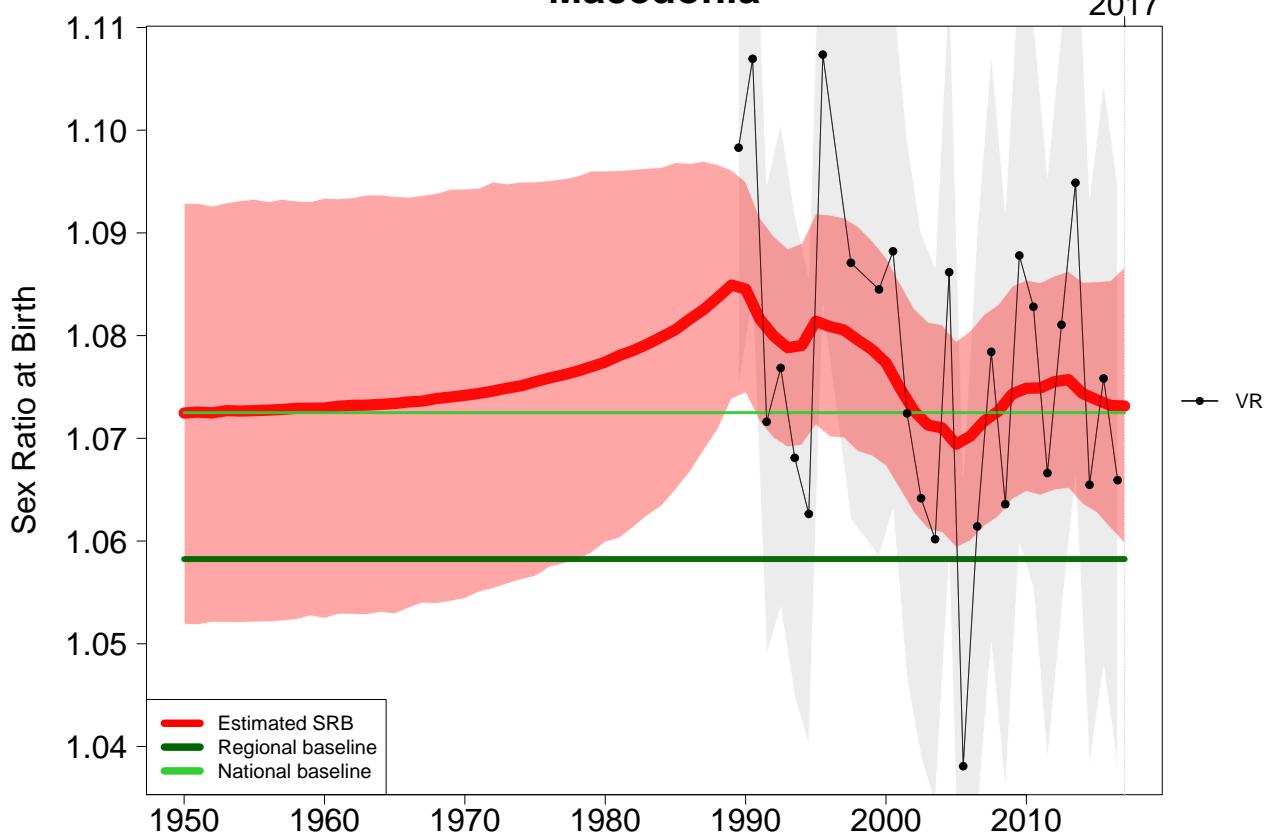
Macao, SAR of China

2017

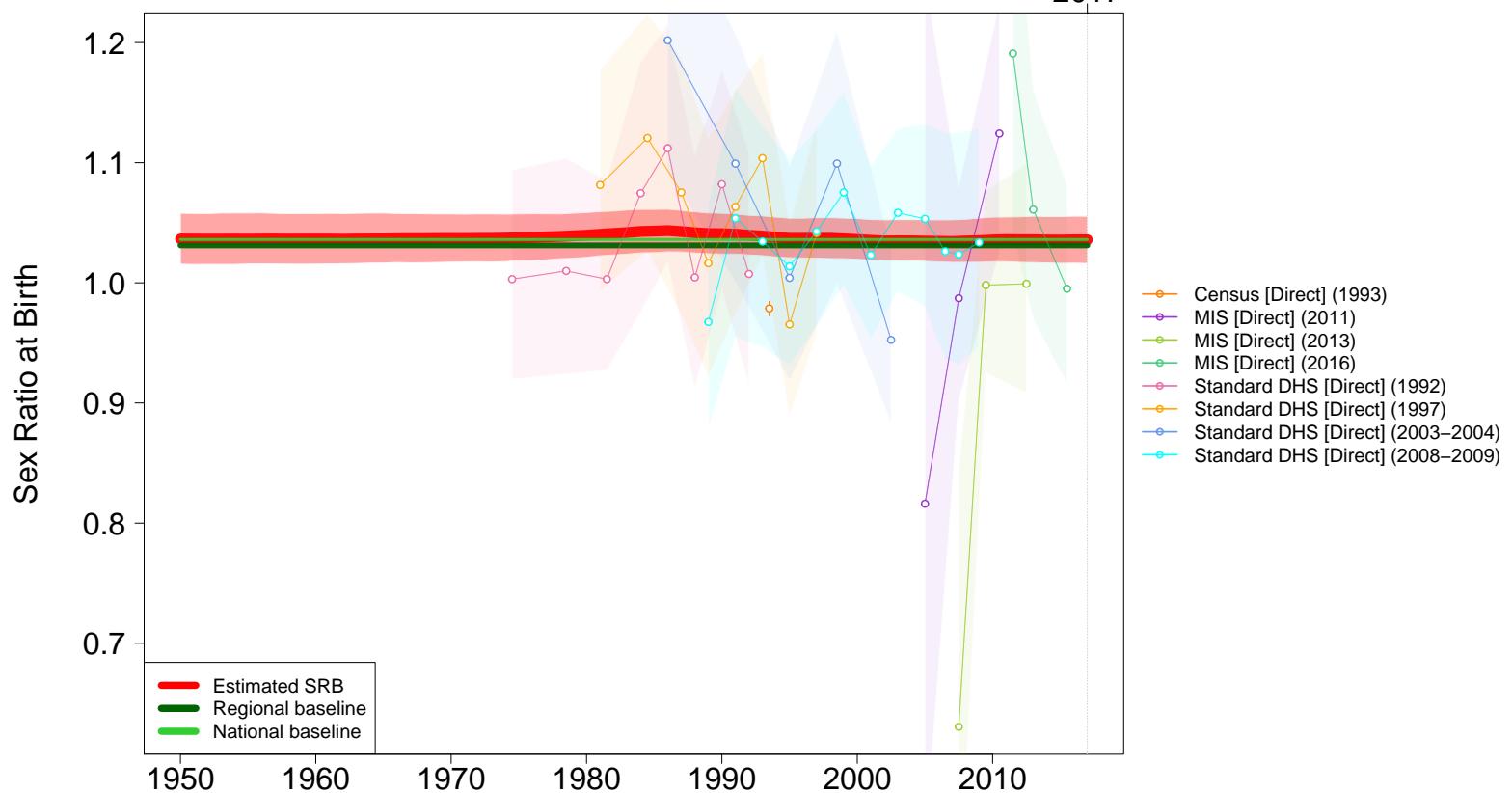


Macedonia

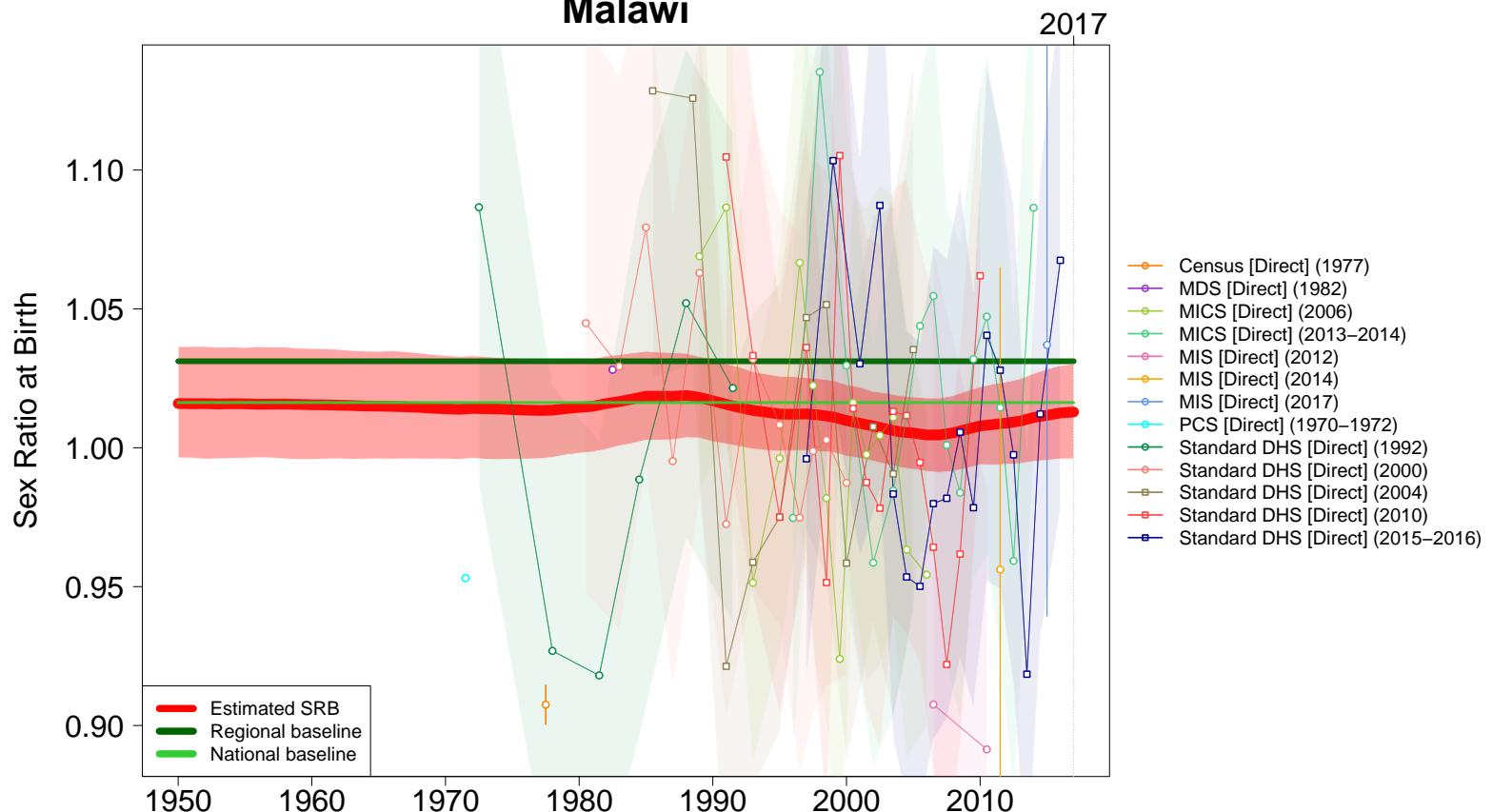
2017



Madagascar

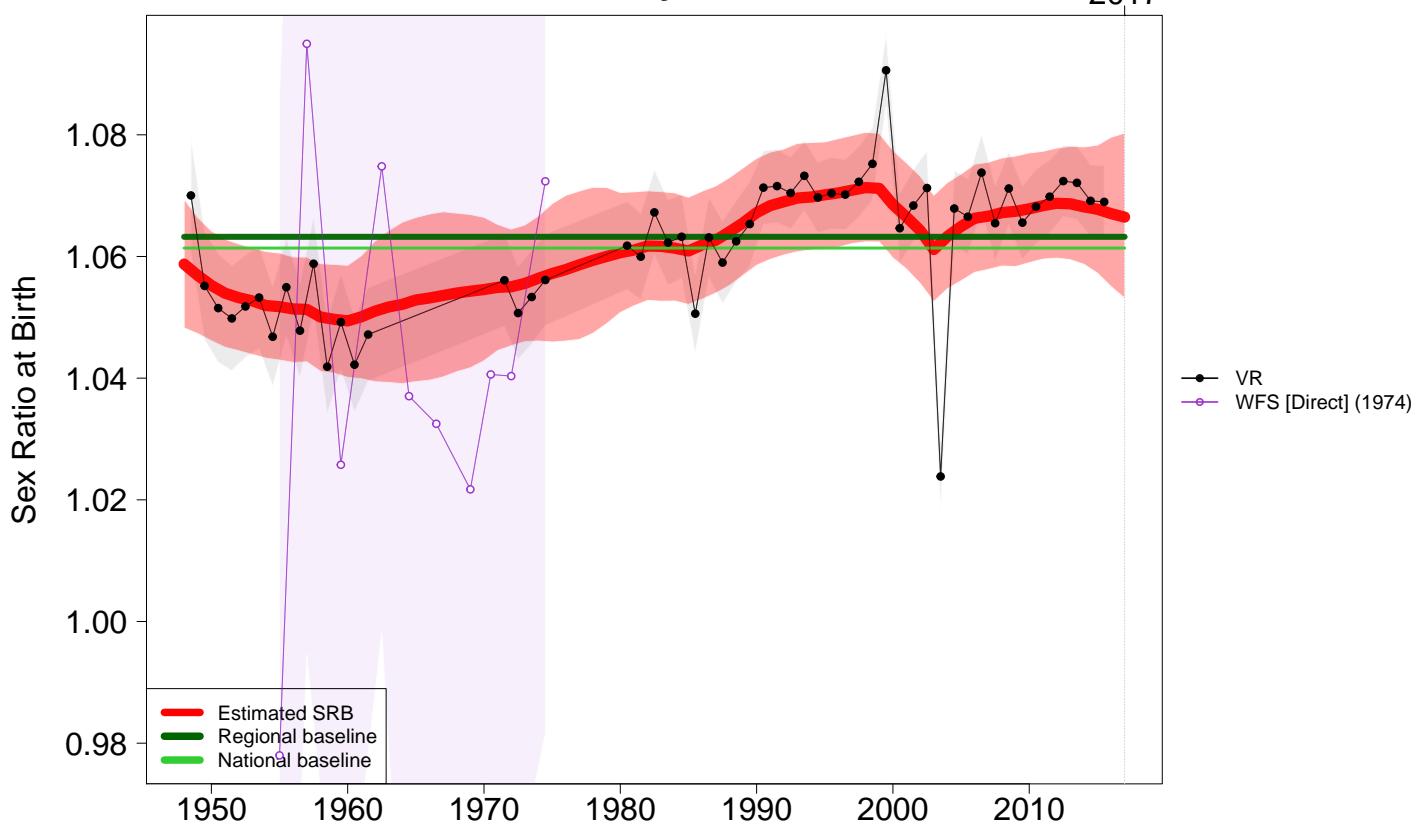


Malawi



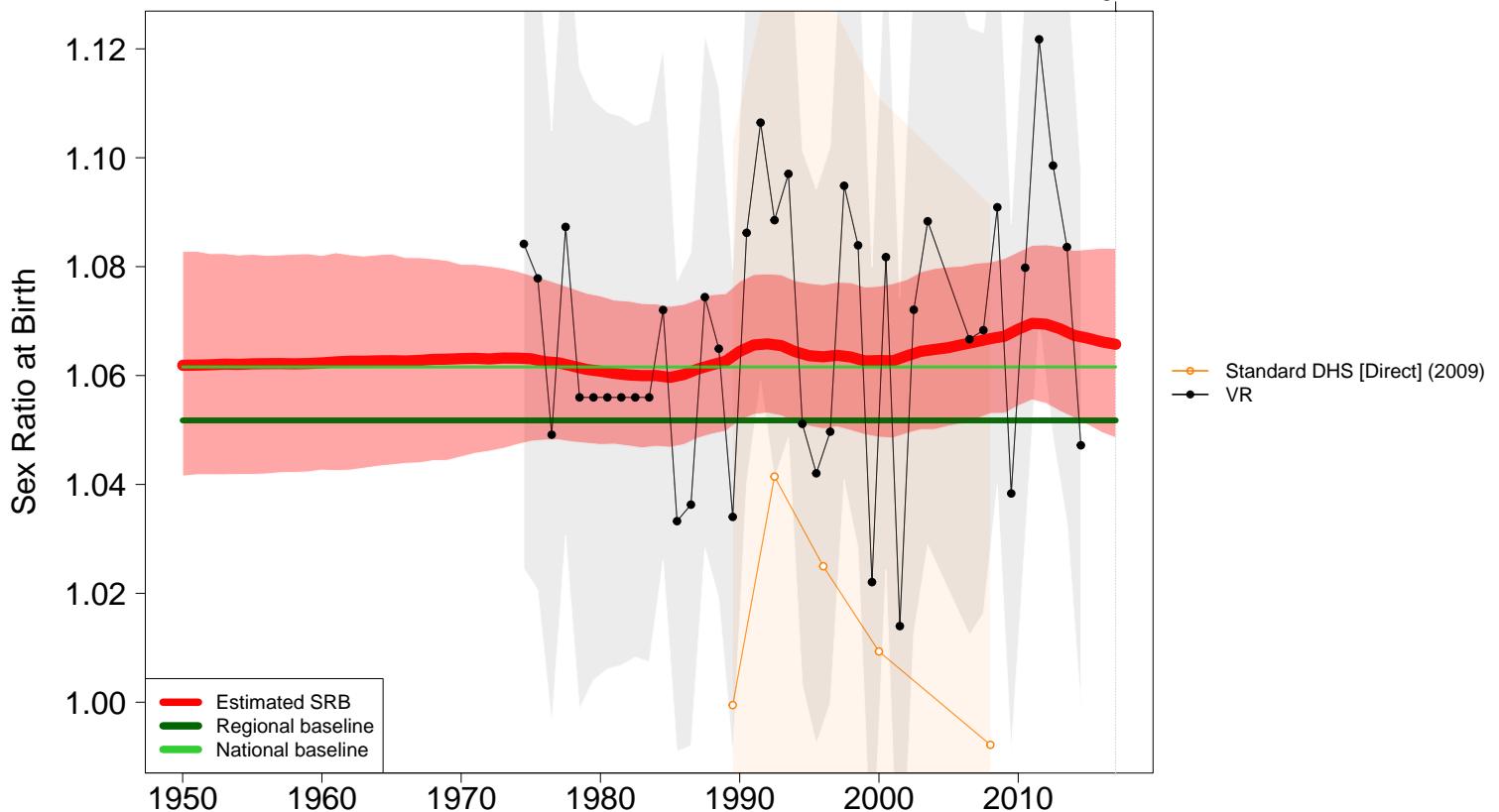
Malaysia

2017



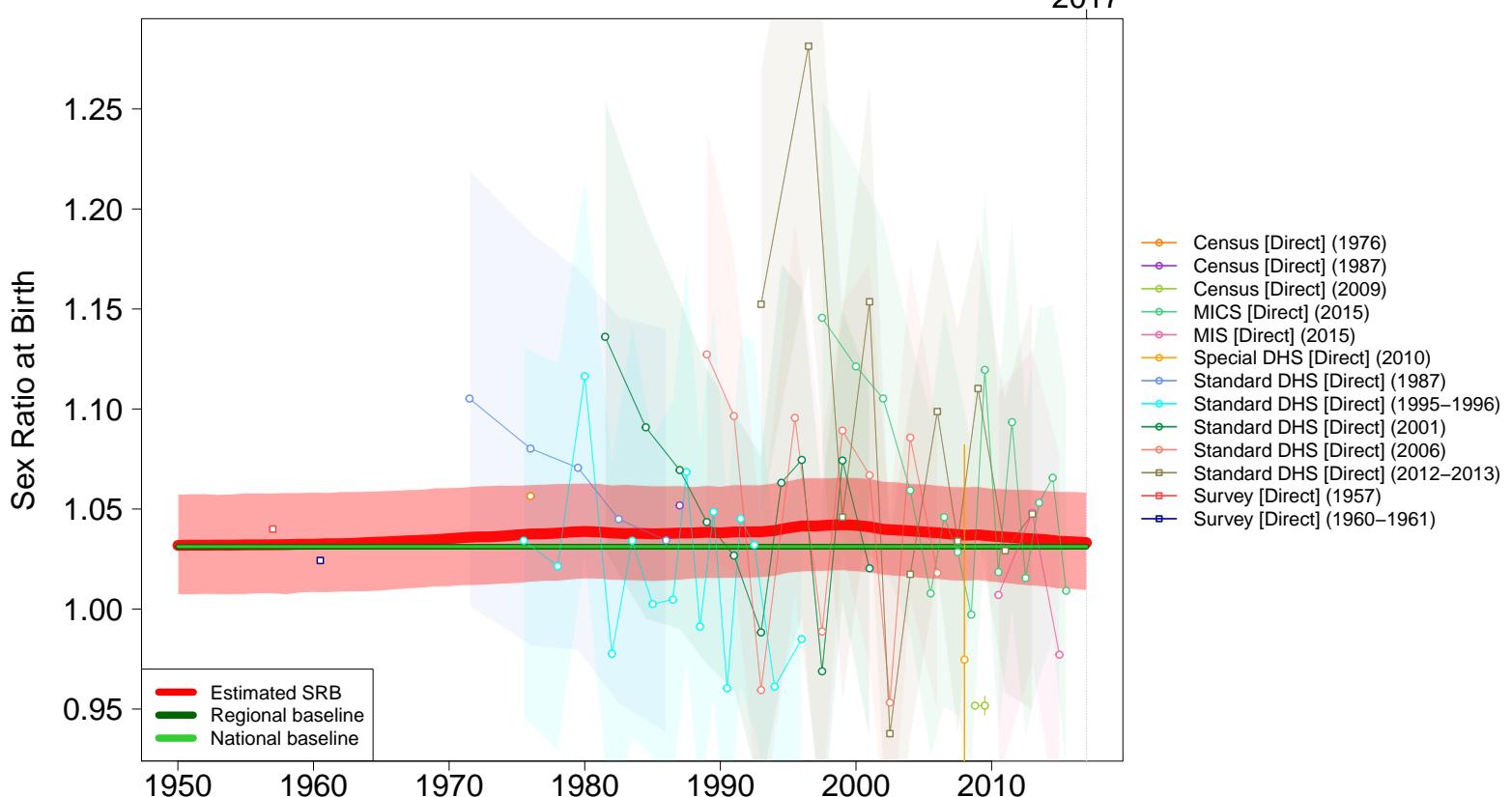
Maldives

2017



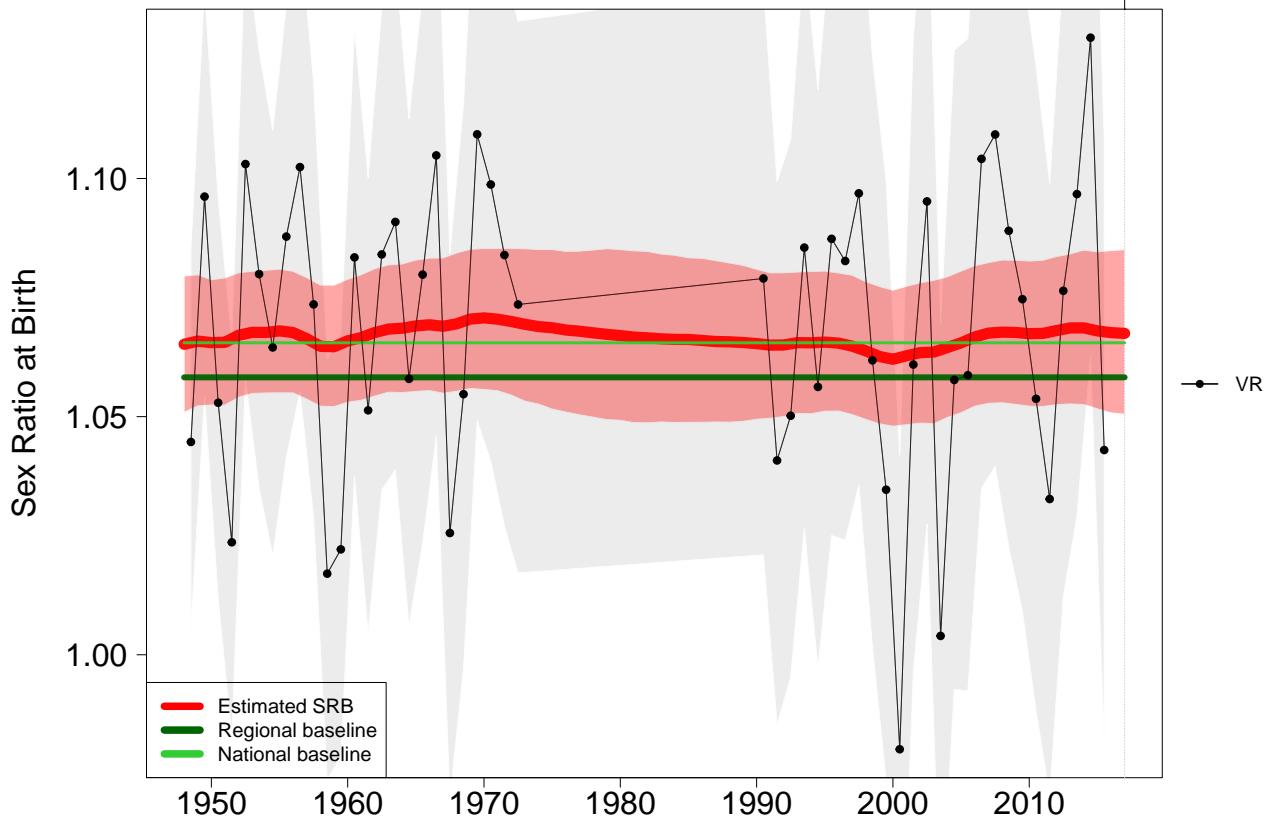
Mali

2017



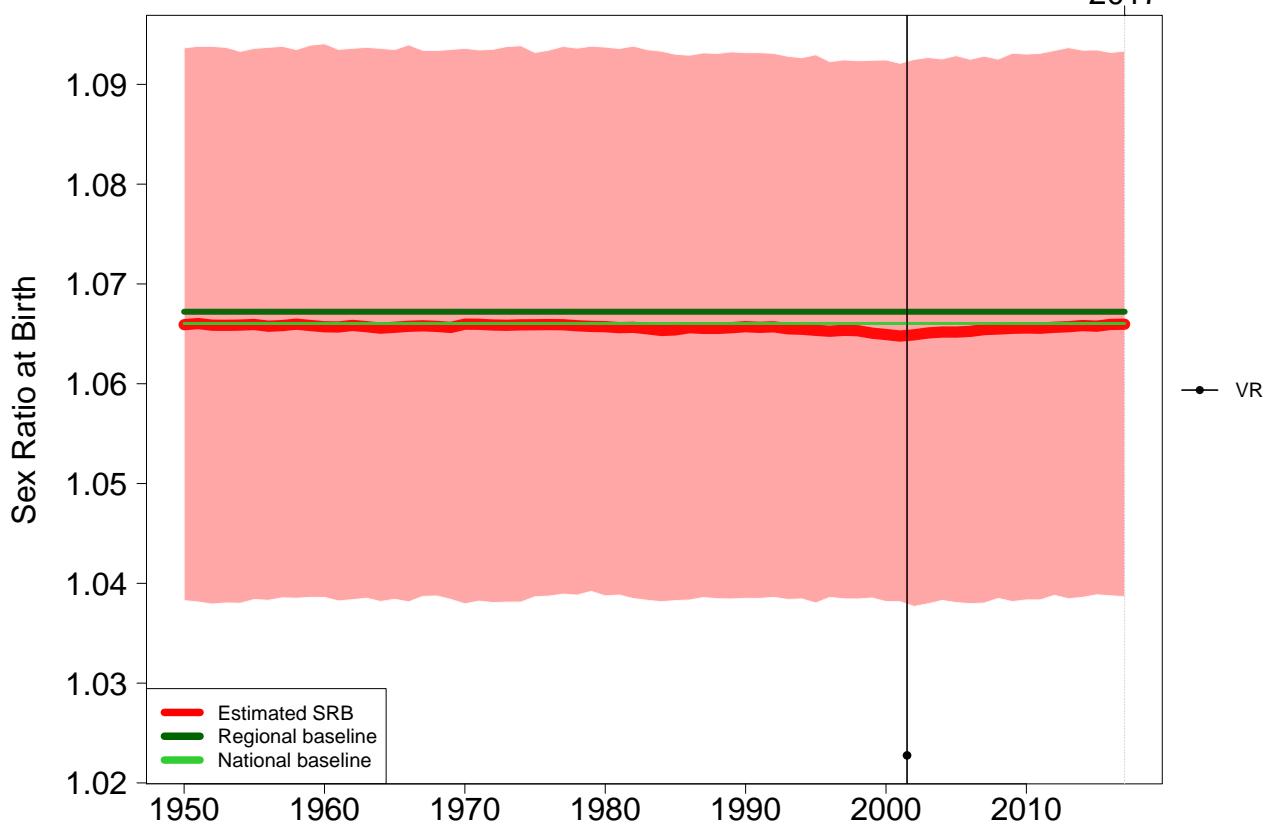
Malta

2017



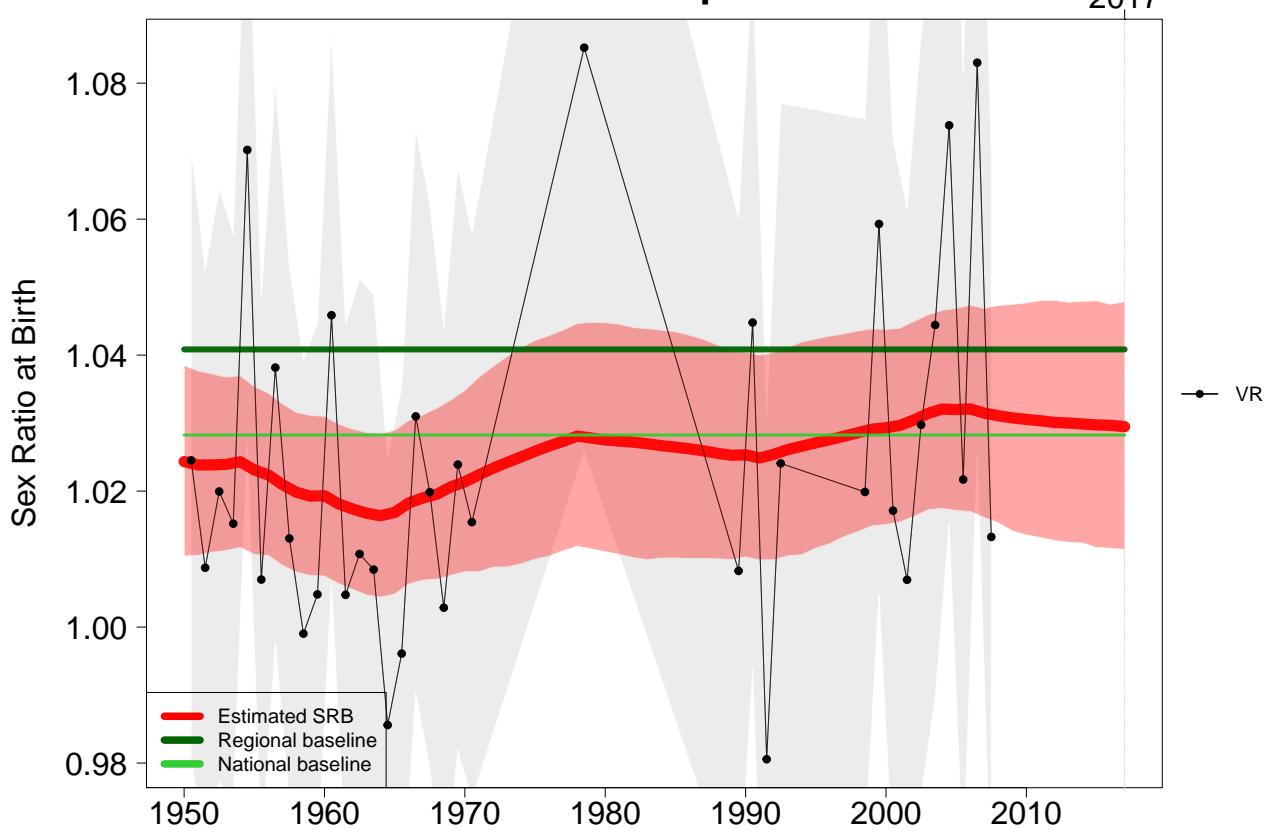
Marshall Islands

2017



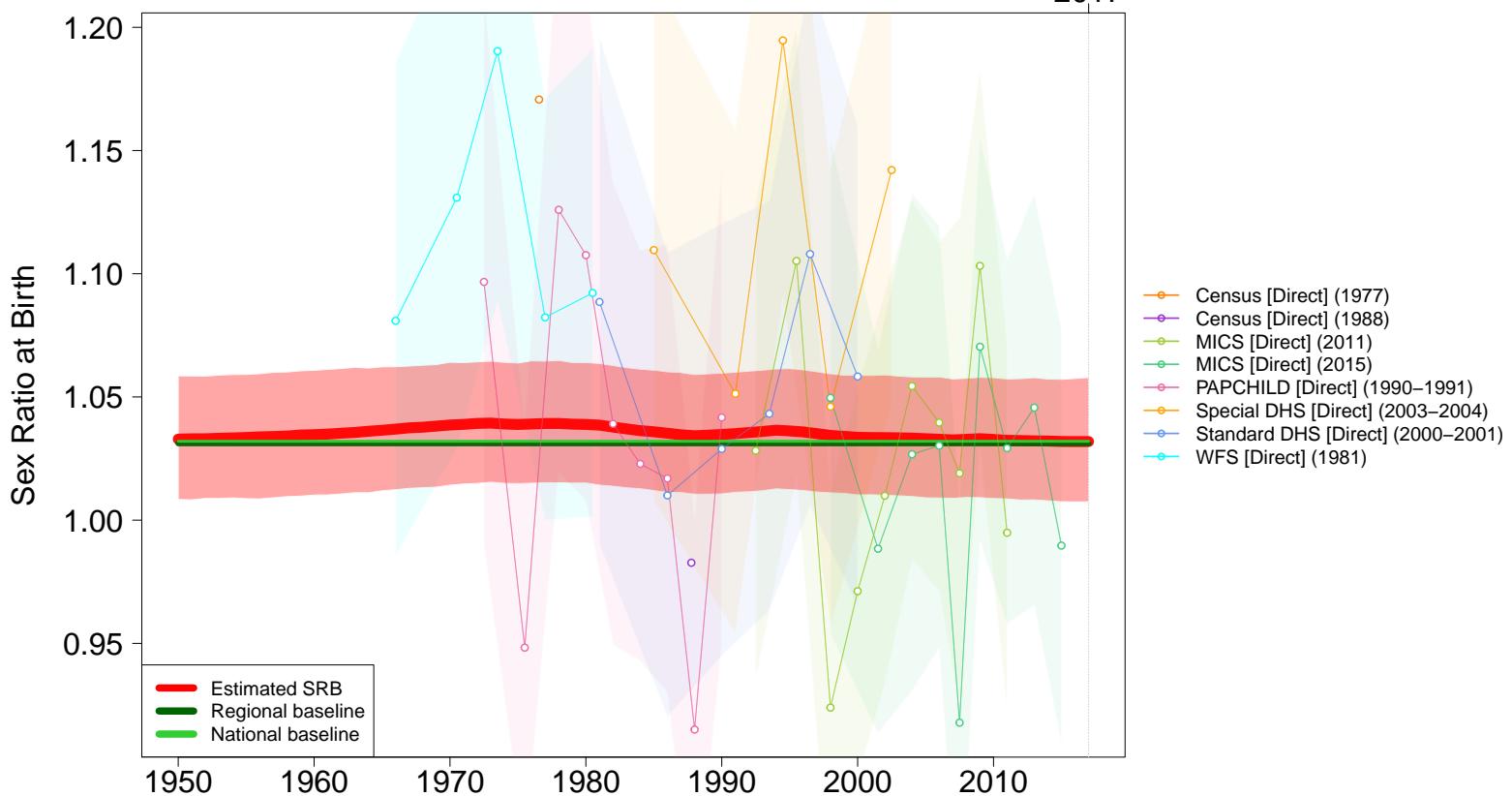
Martinique

2017



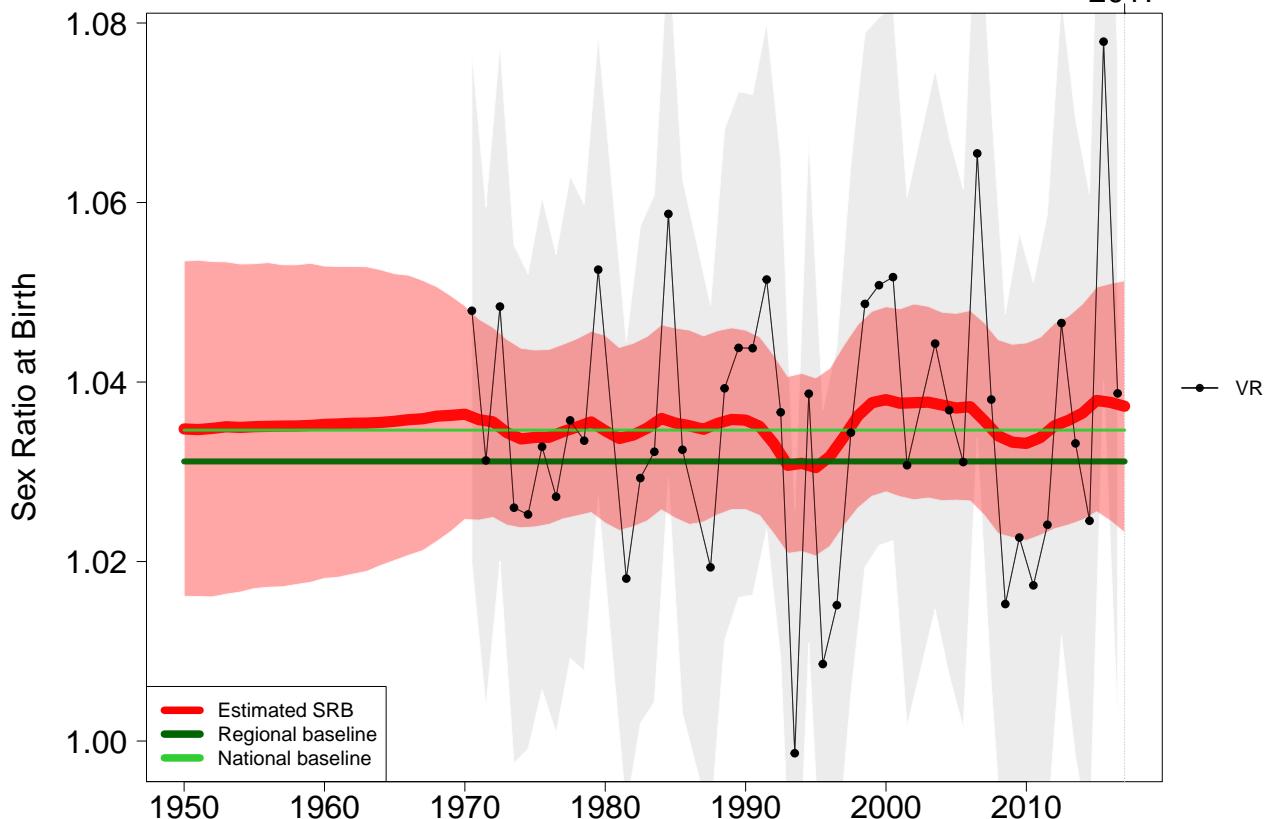
Mauritania

2017



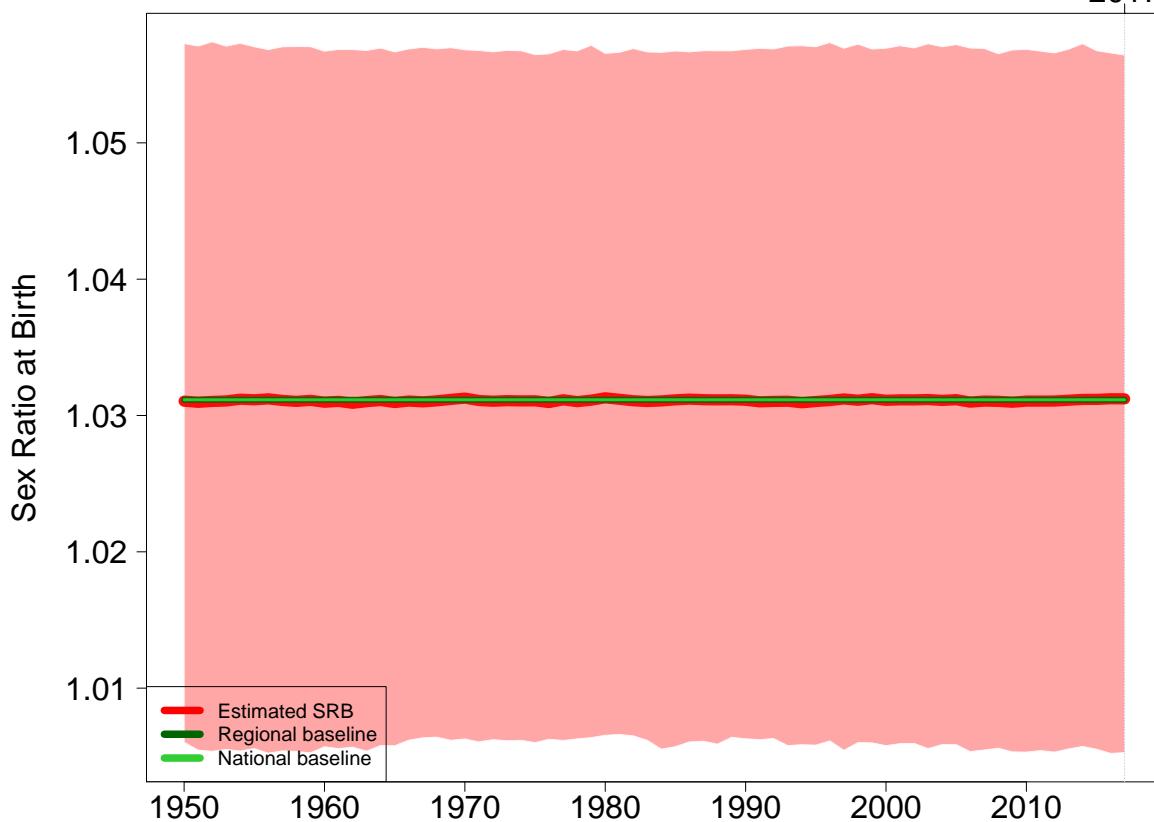
Mauritius

2017



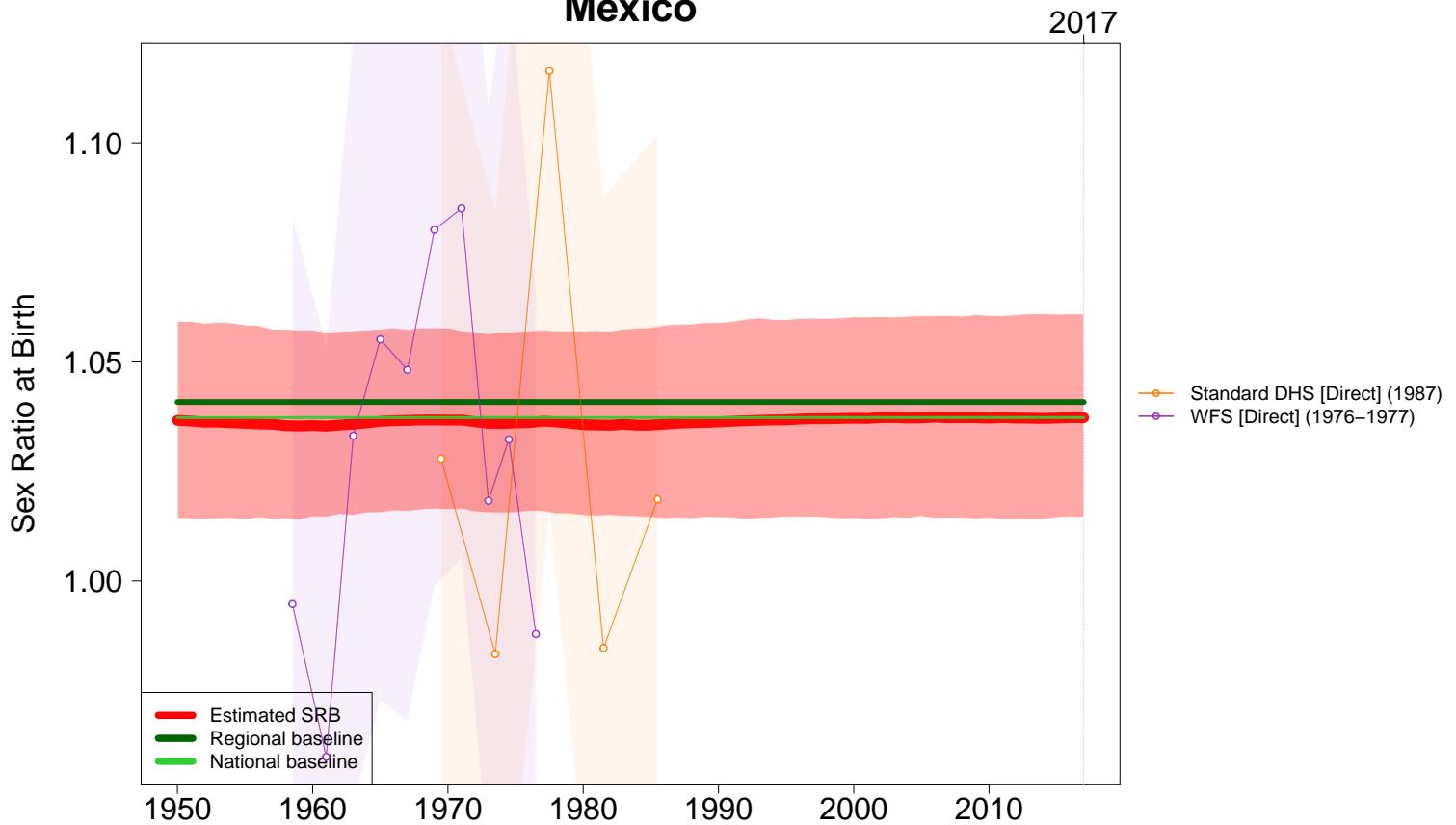
Mayotte

2017



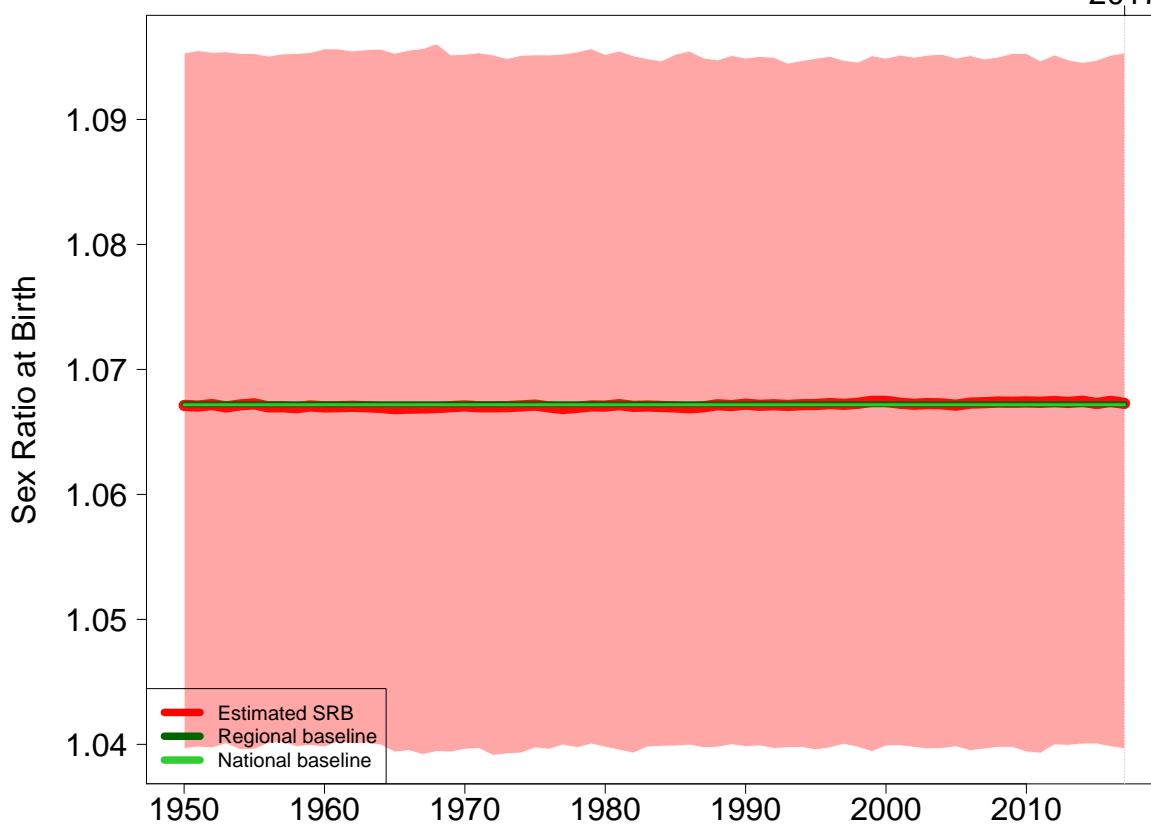
Mexico

2017



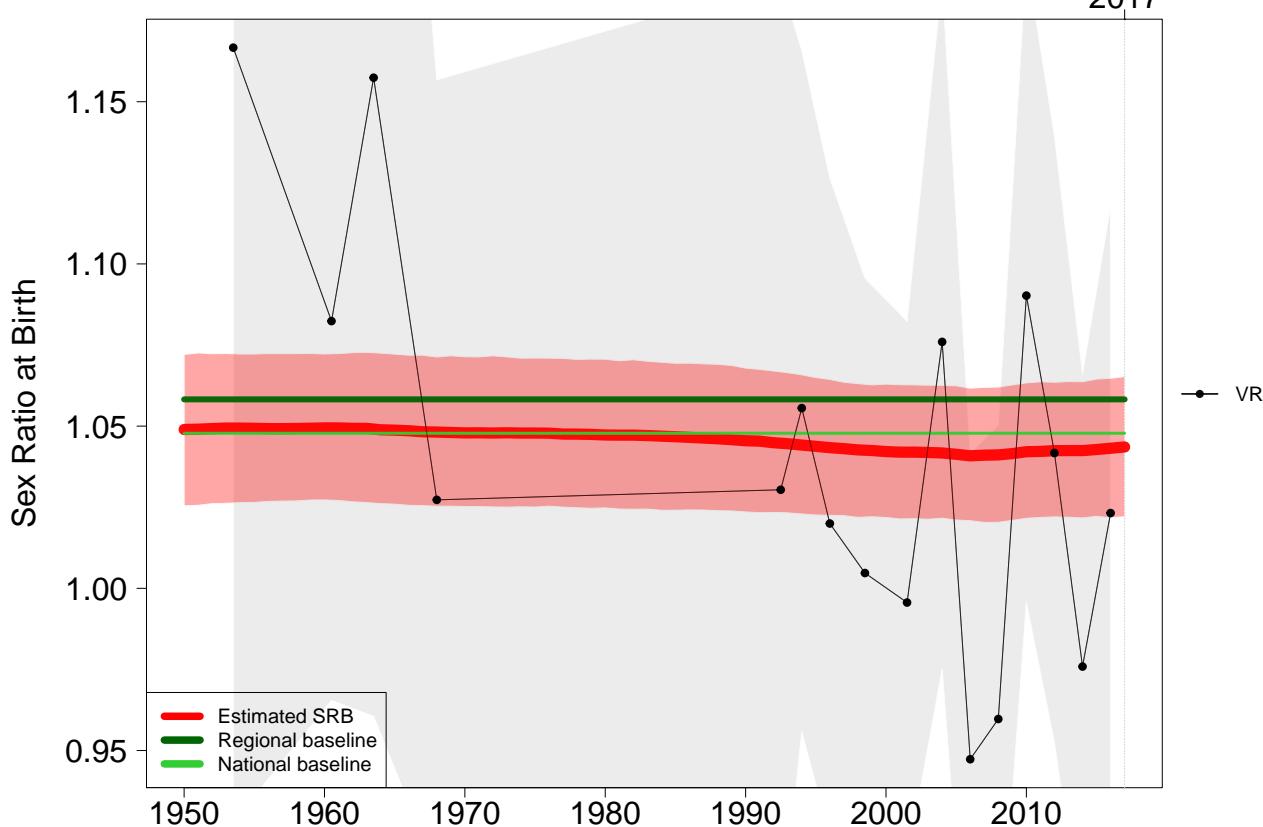
Micronesia

2017



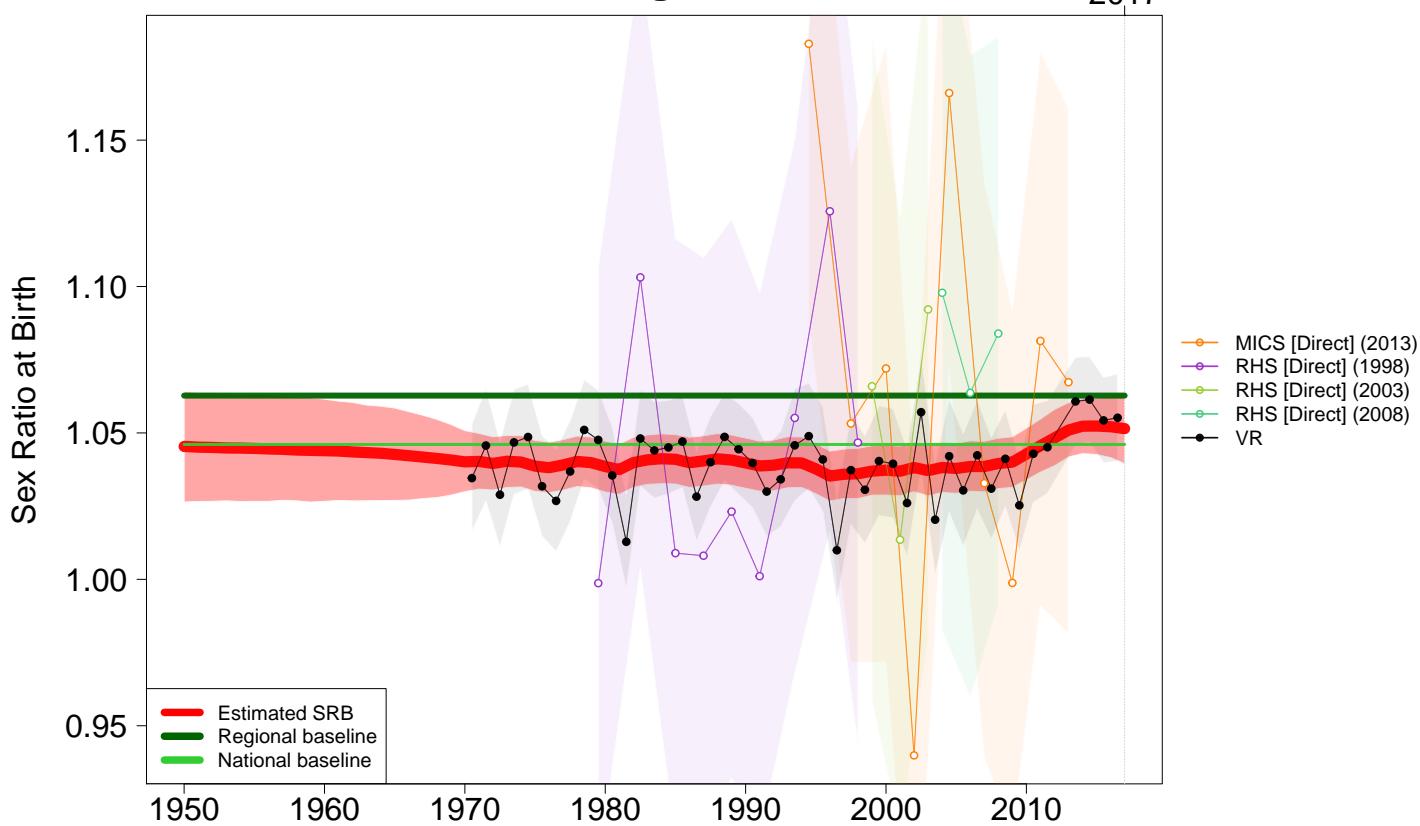
Monaco

2017



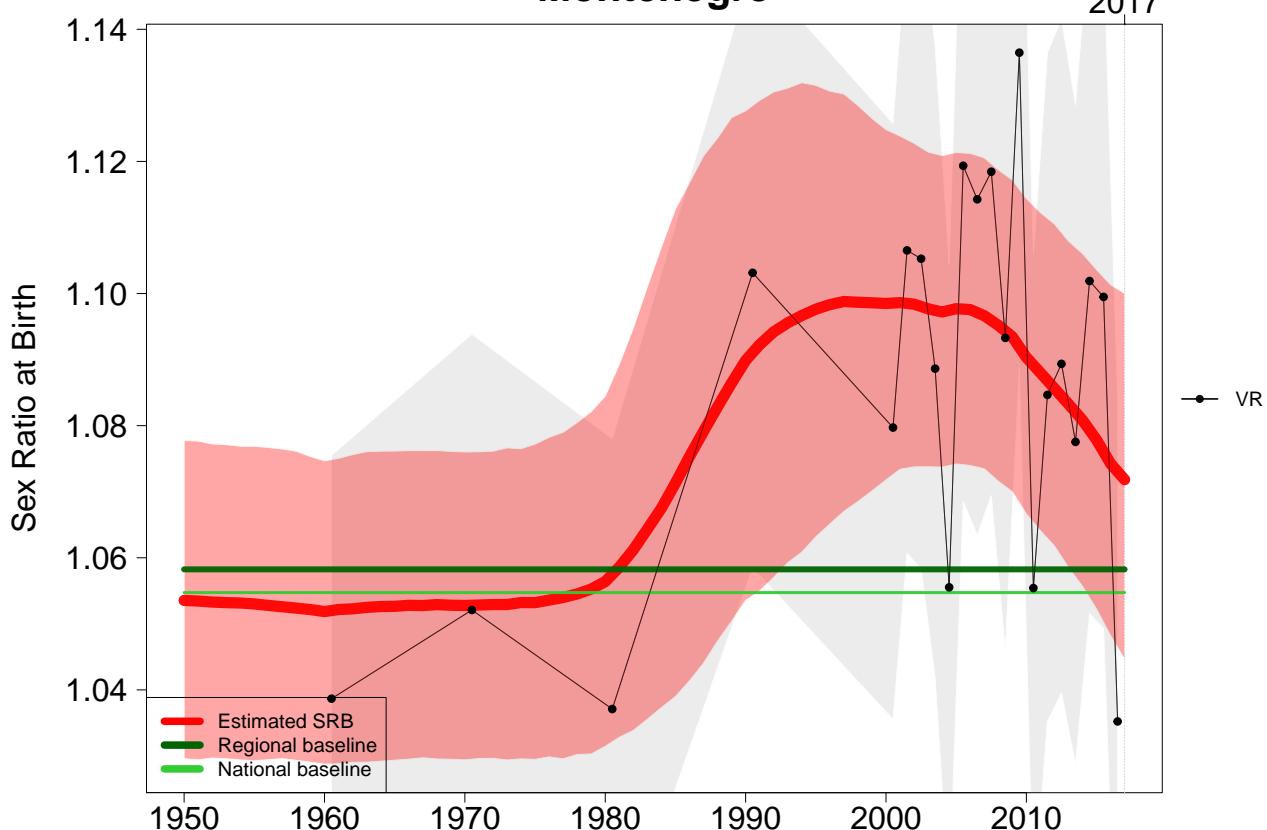
Mongolia

2017

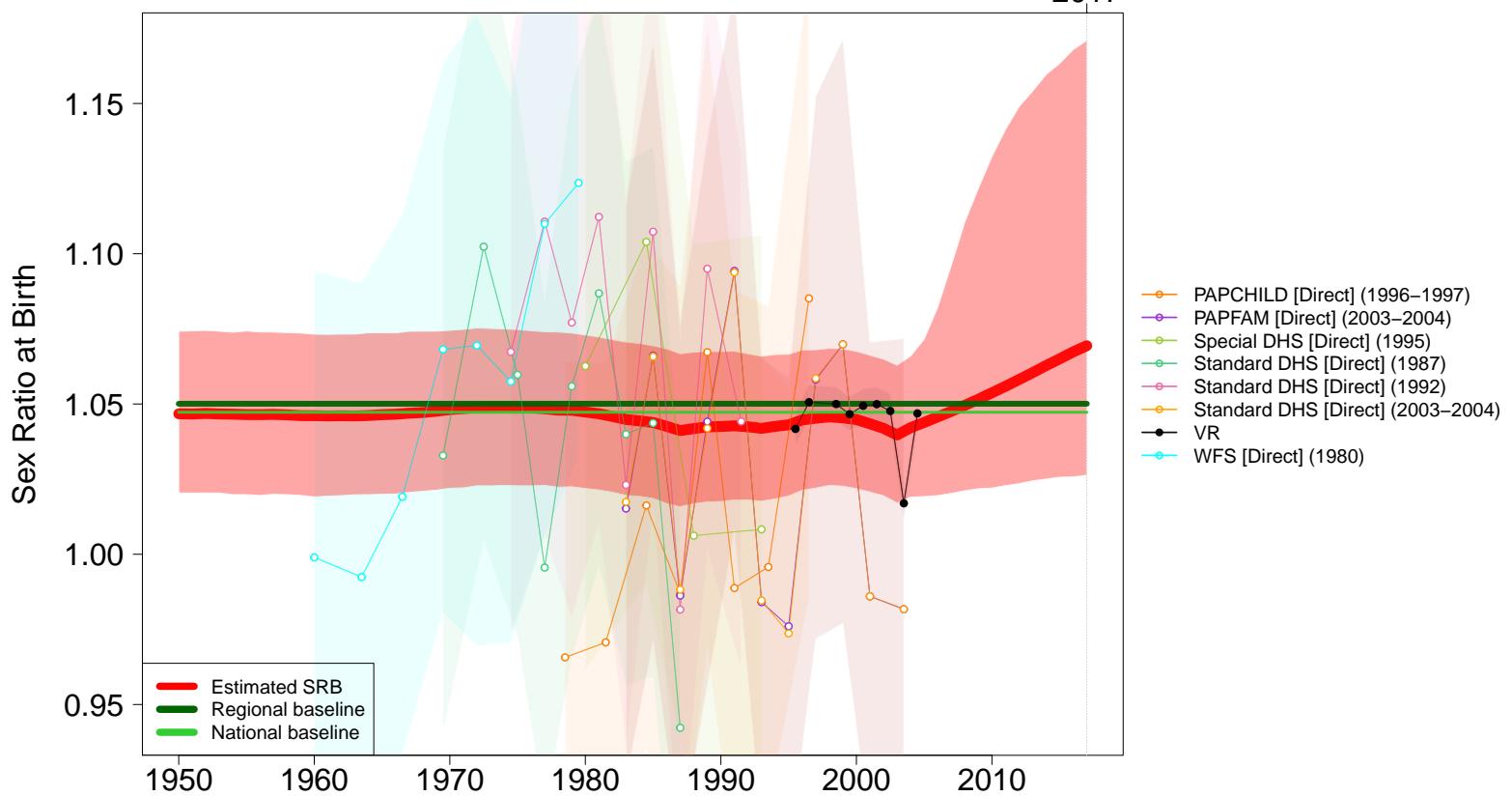


Montenegro

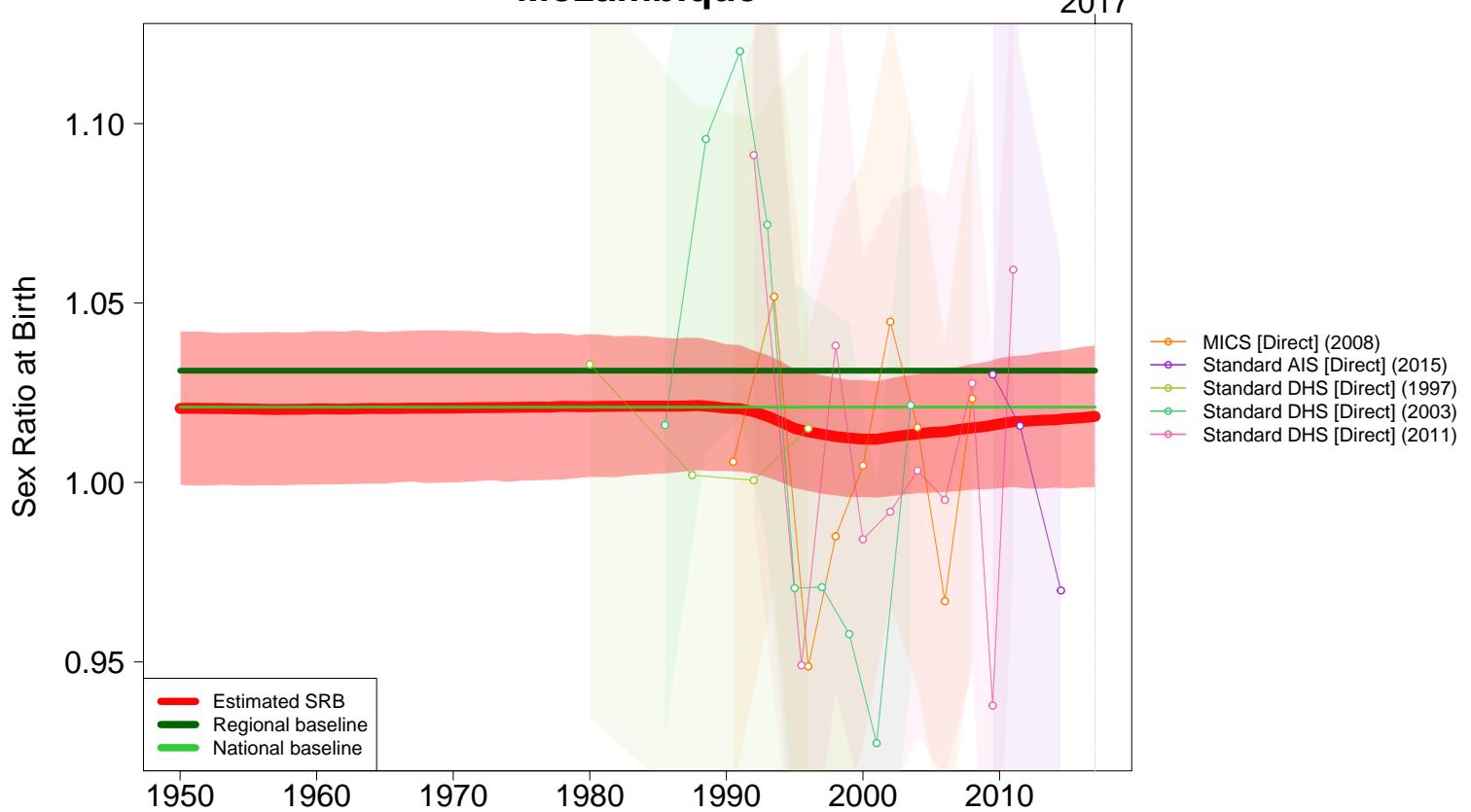
2017



Morocco

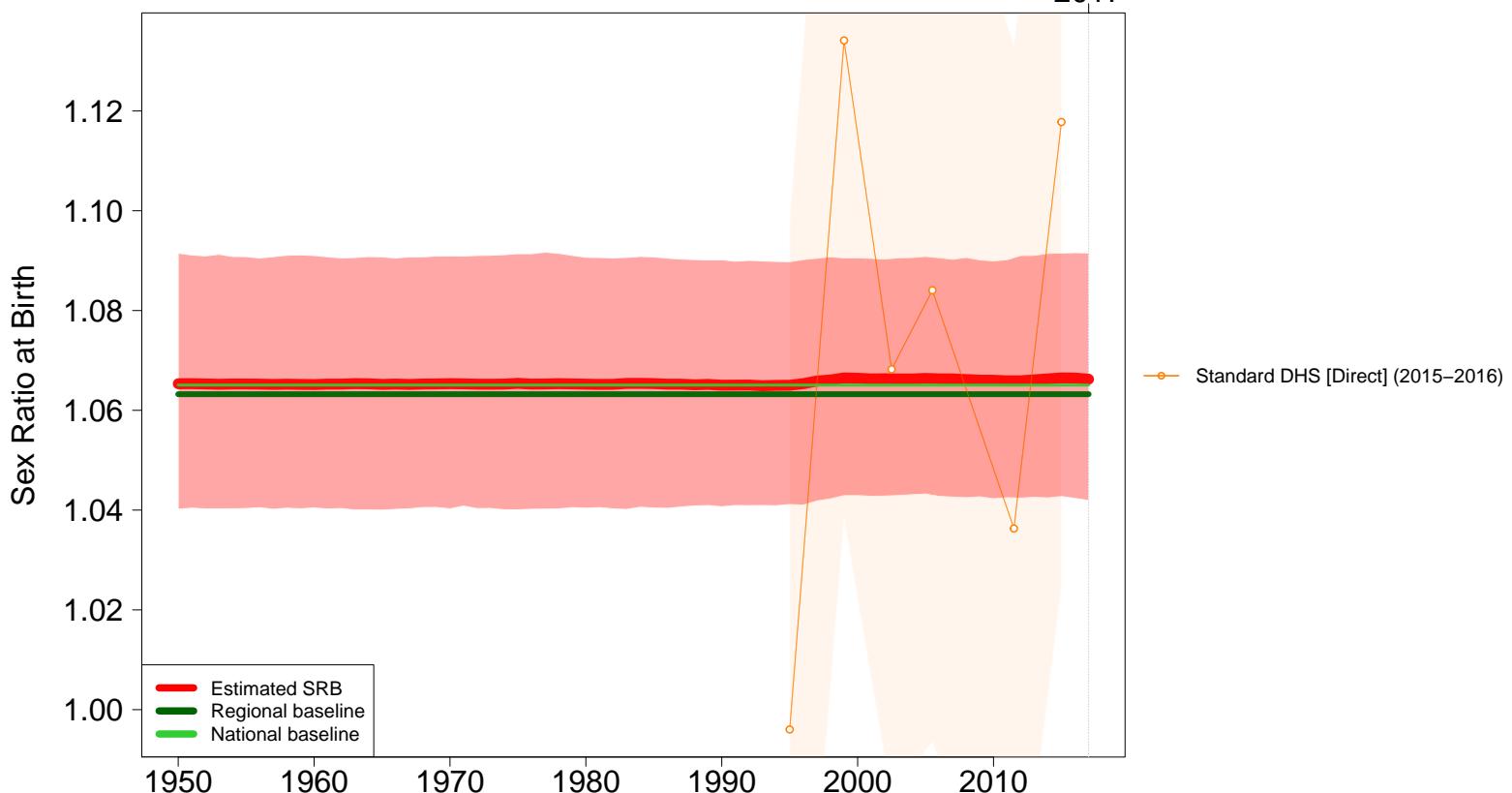


Mozambique



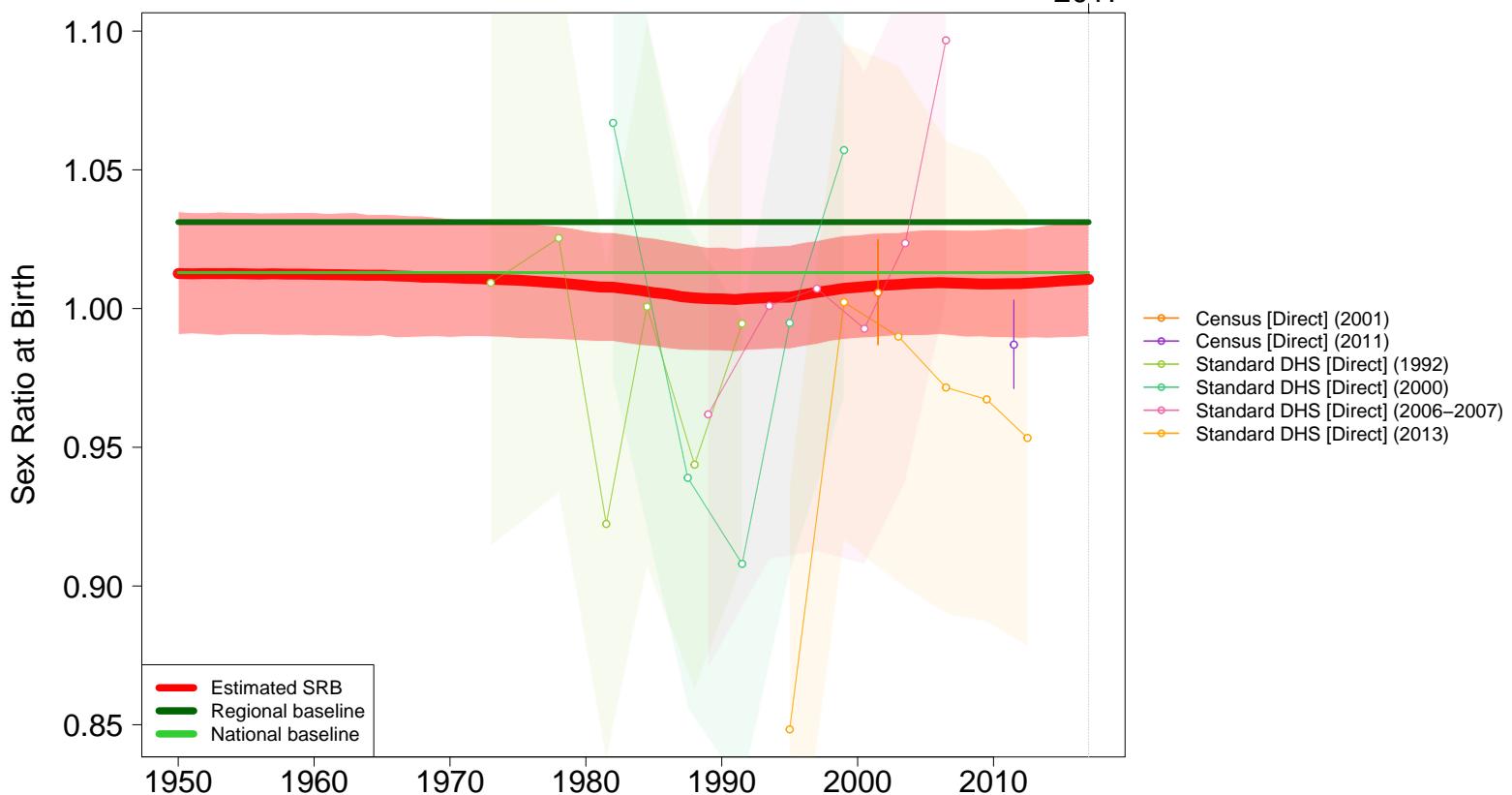
Myanmar

2017



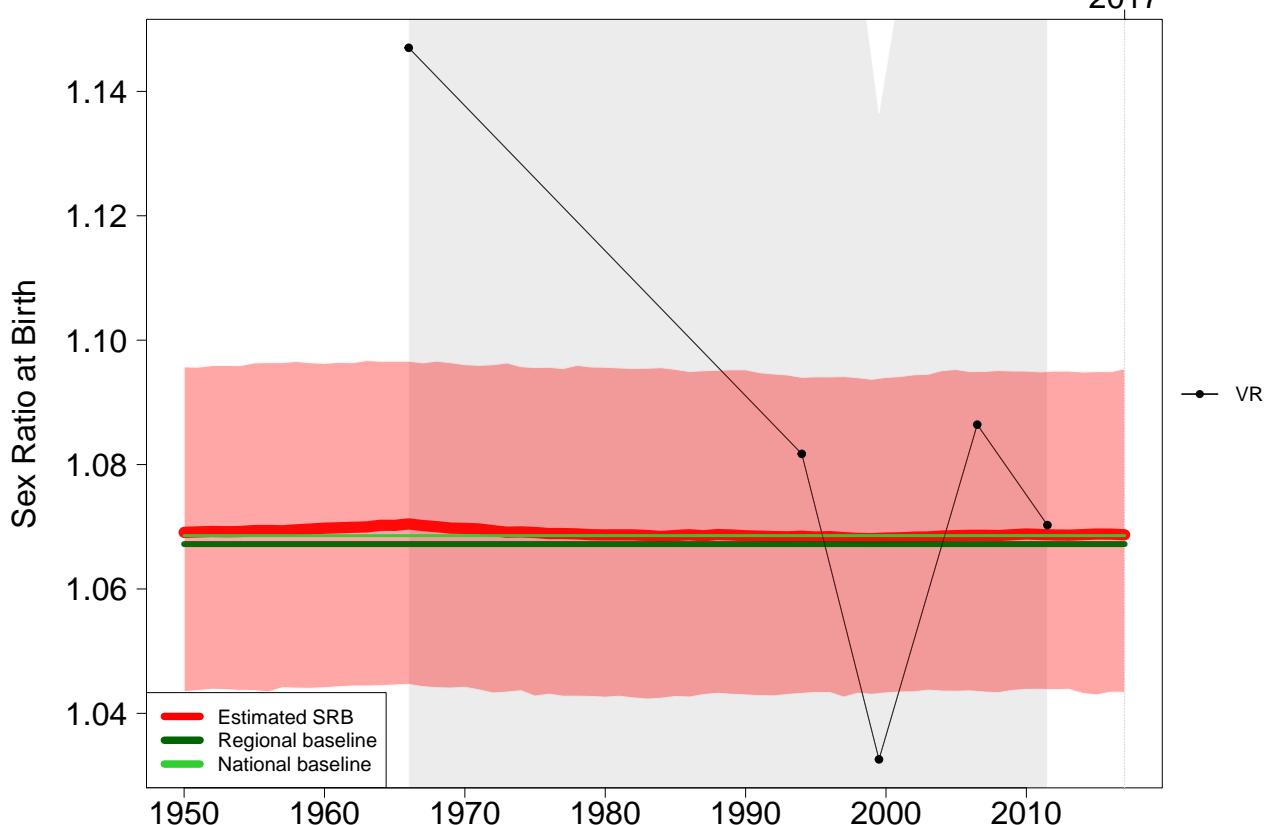
Namibia

2017



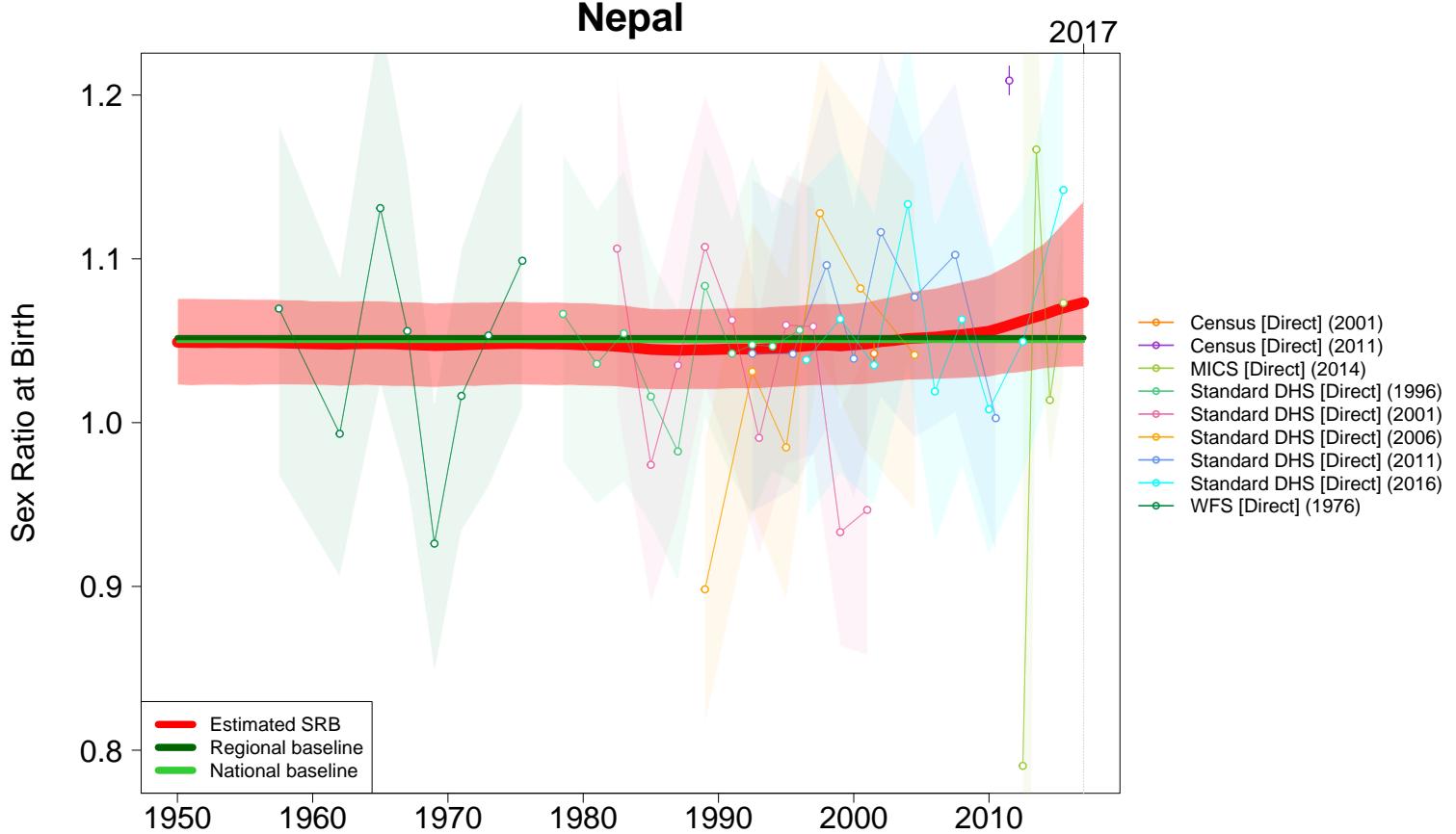
Nauru

2017



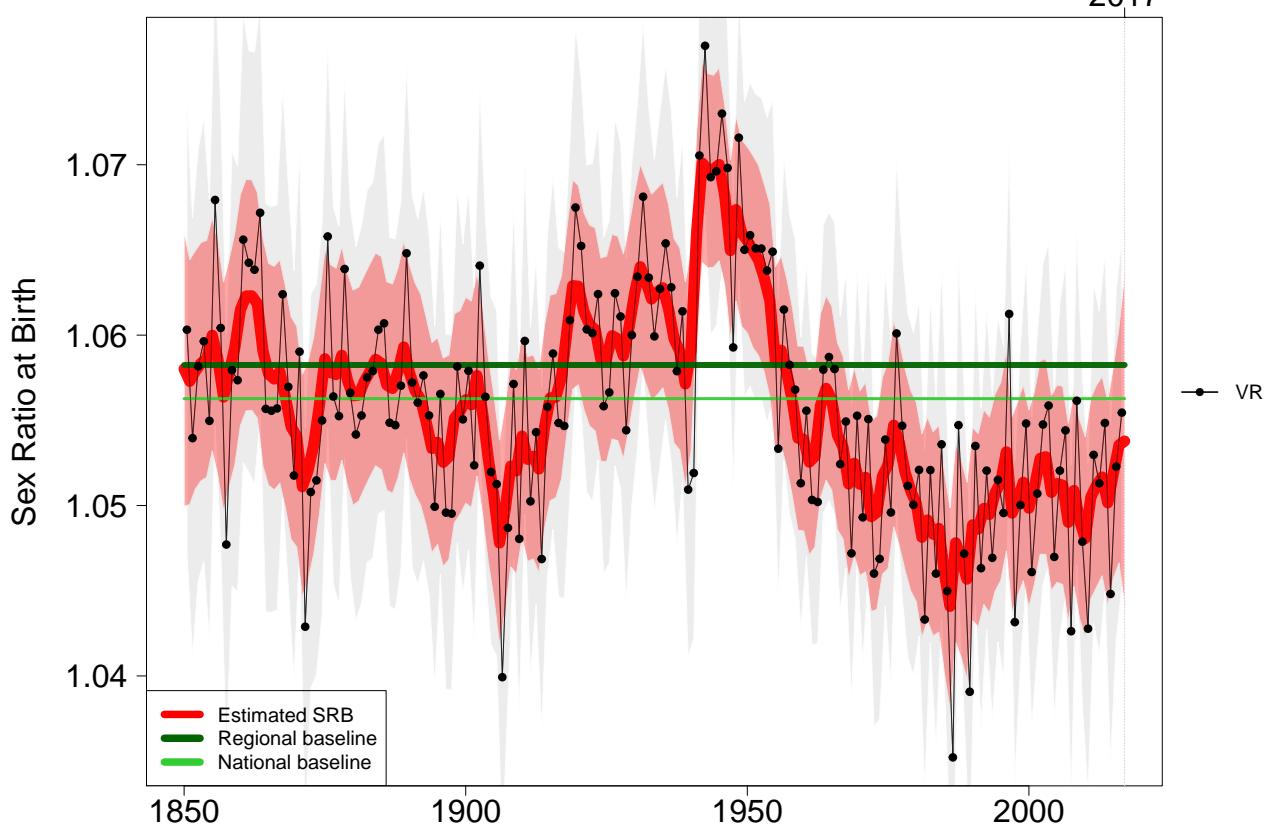
Nepal

2017



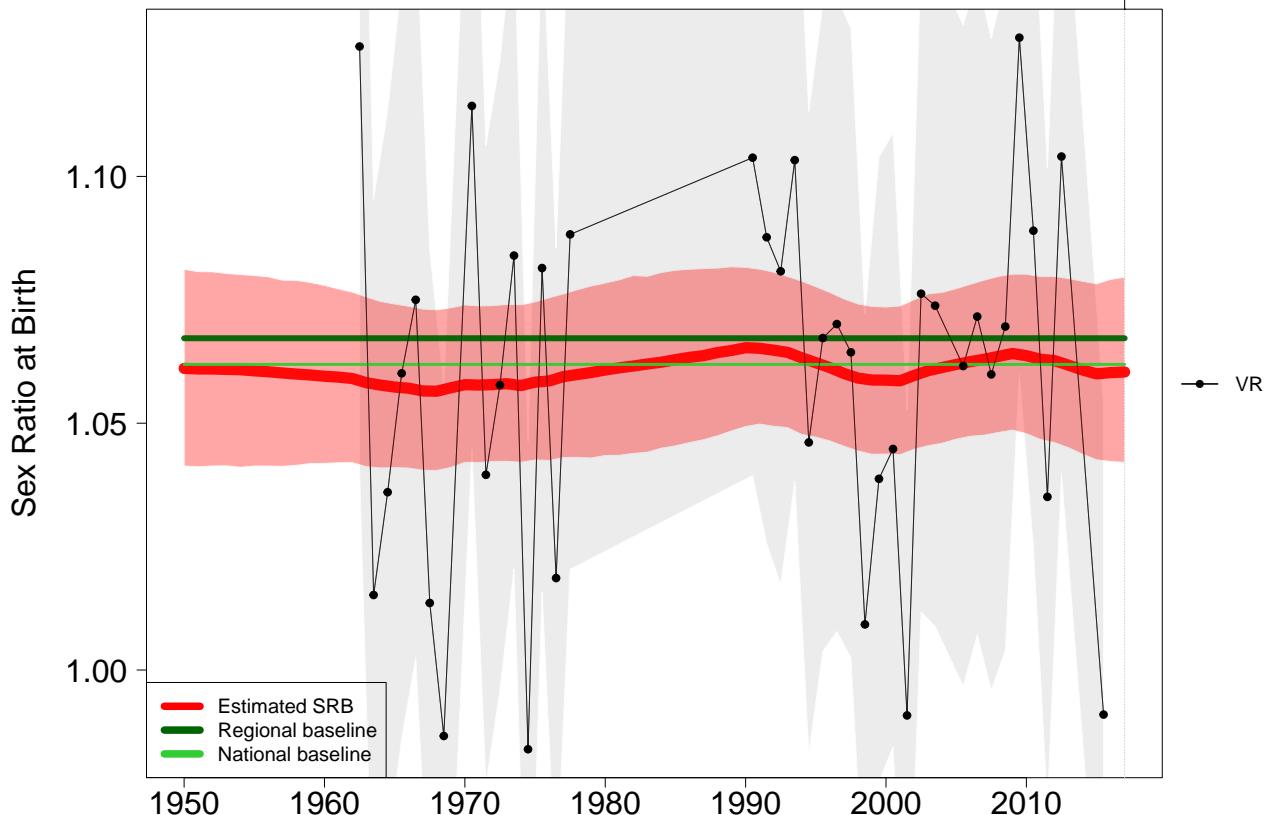
Netherlands

2017



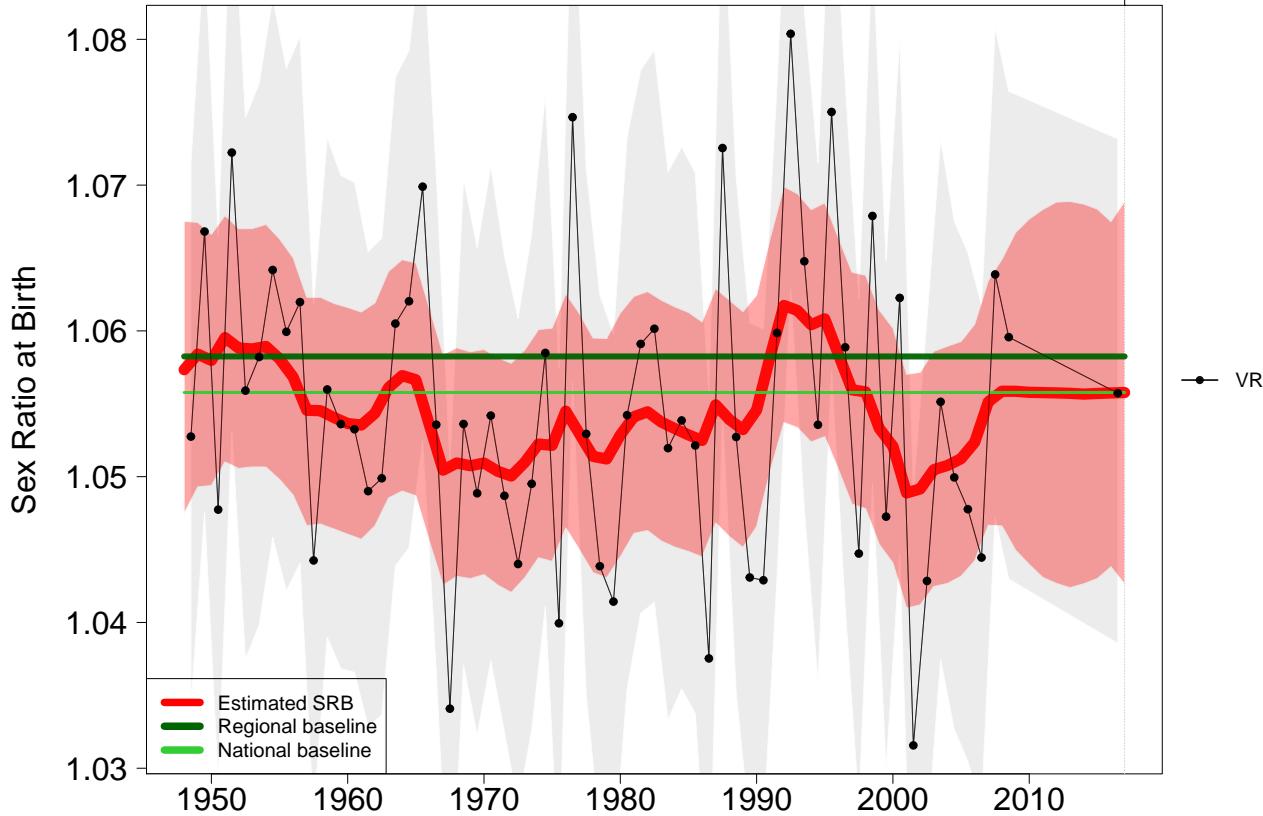
New Caledonia

2017



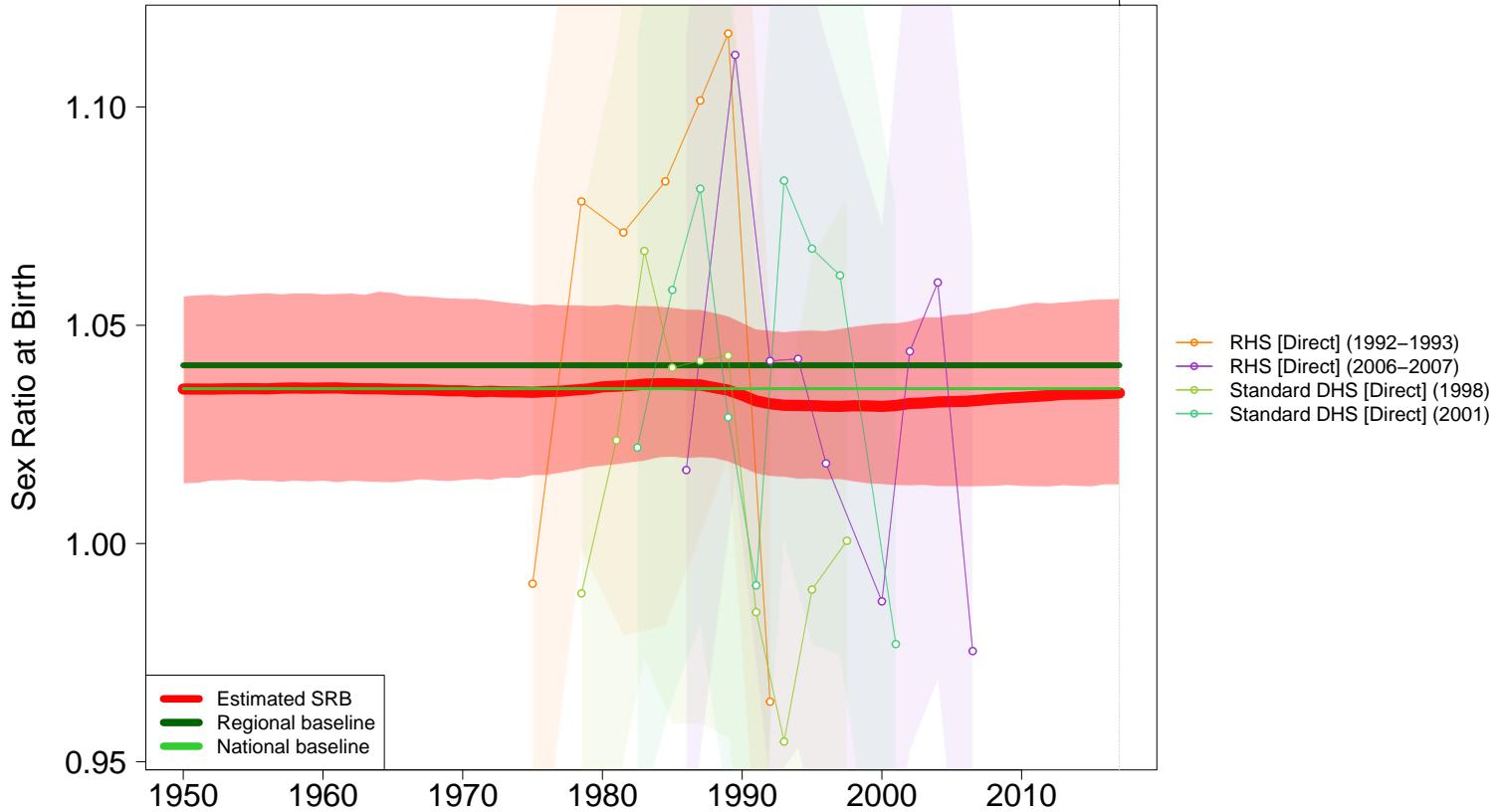
New Zealand

2017



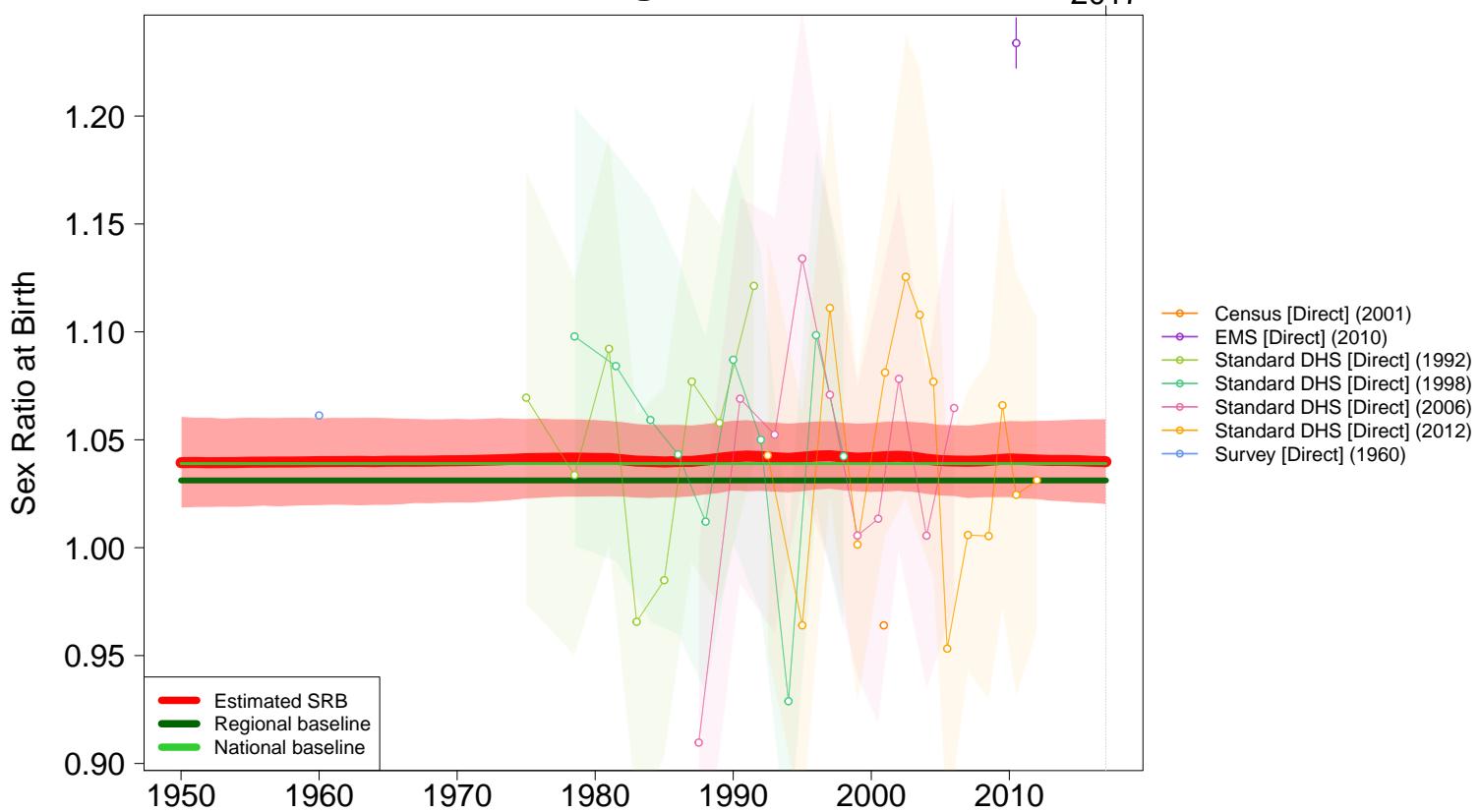
Nicaragua

2017



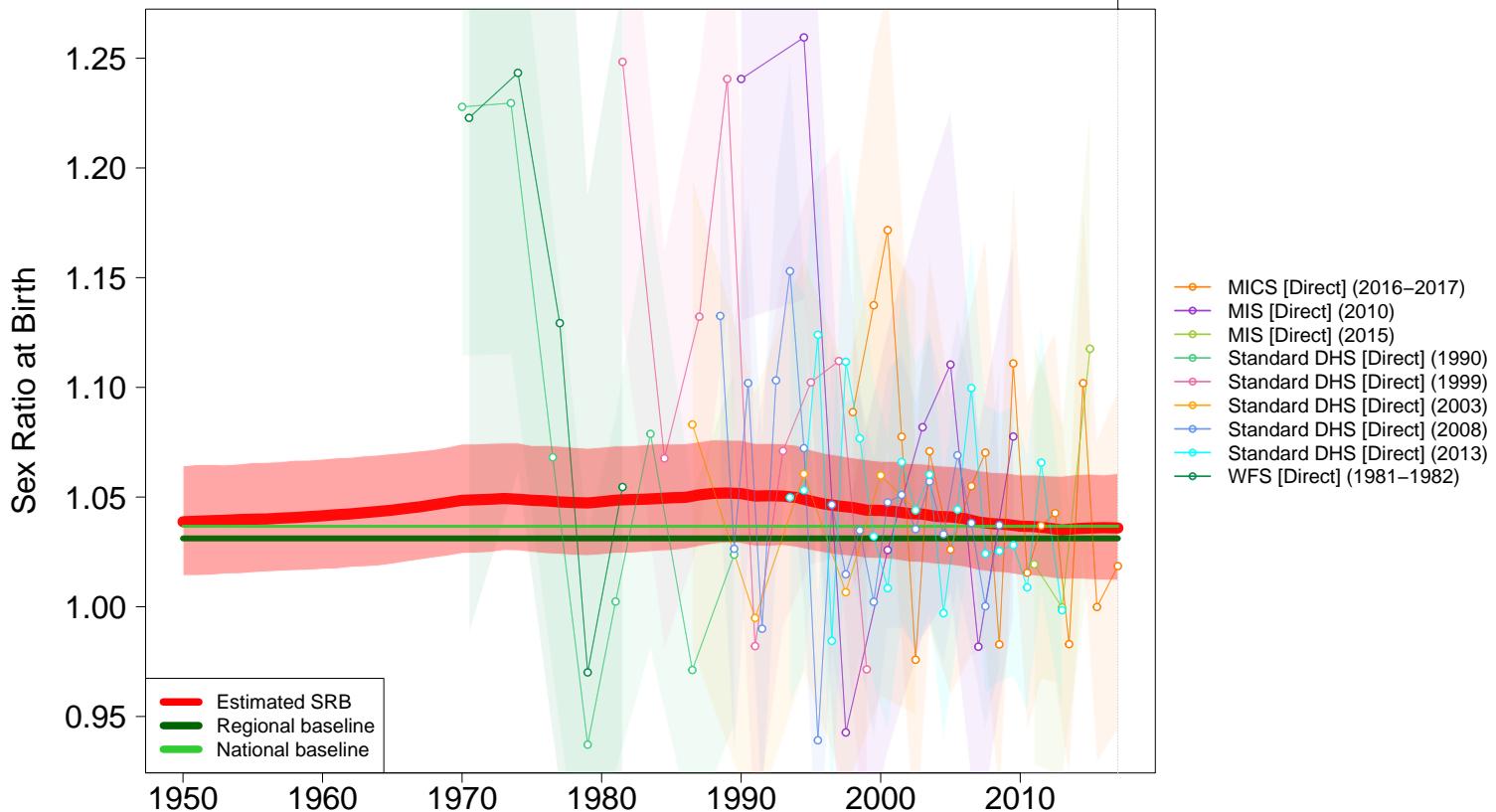
Niger

2017



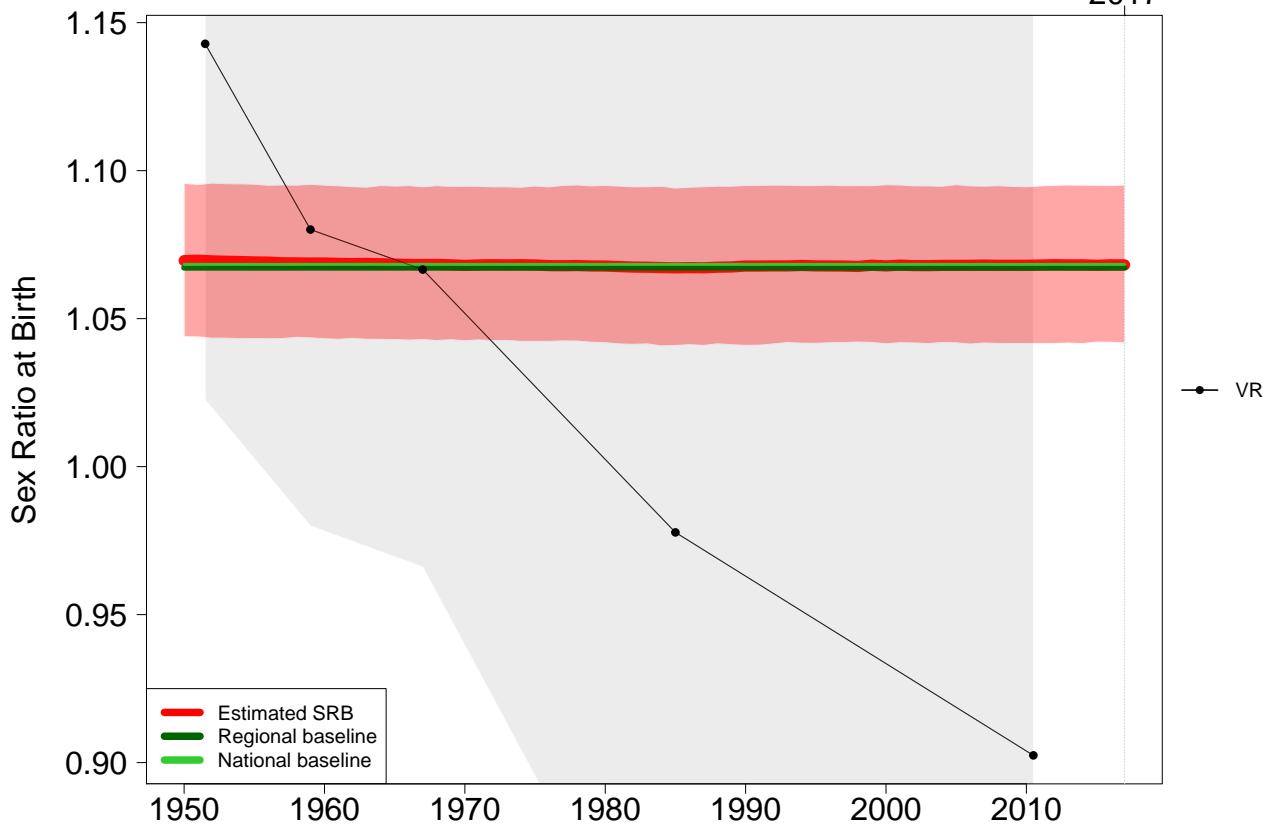
Nigeria

2017



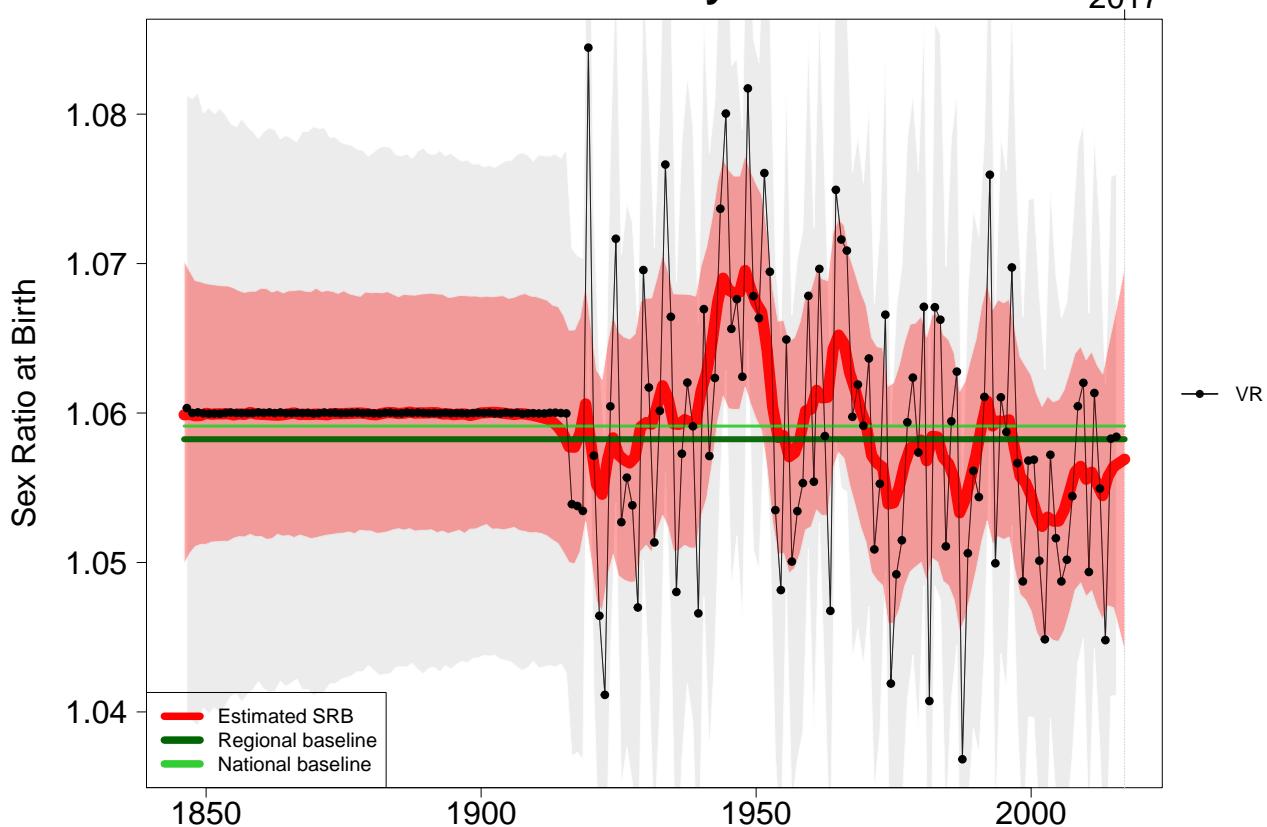
Niue

2017

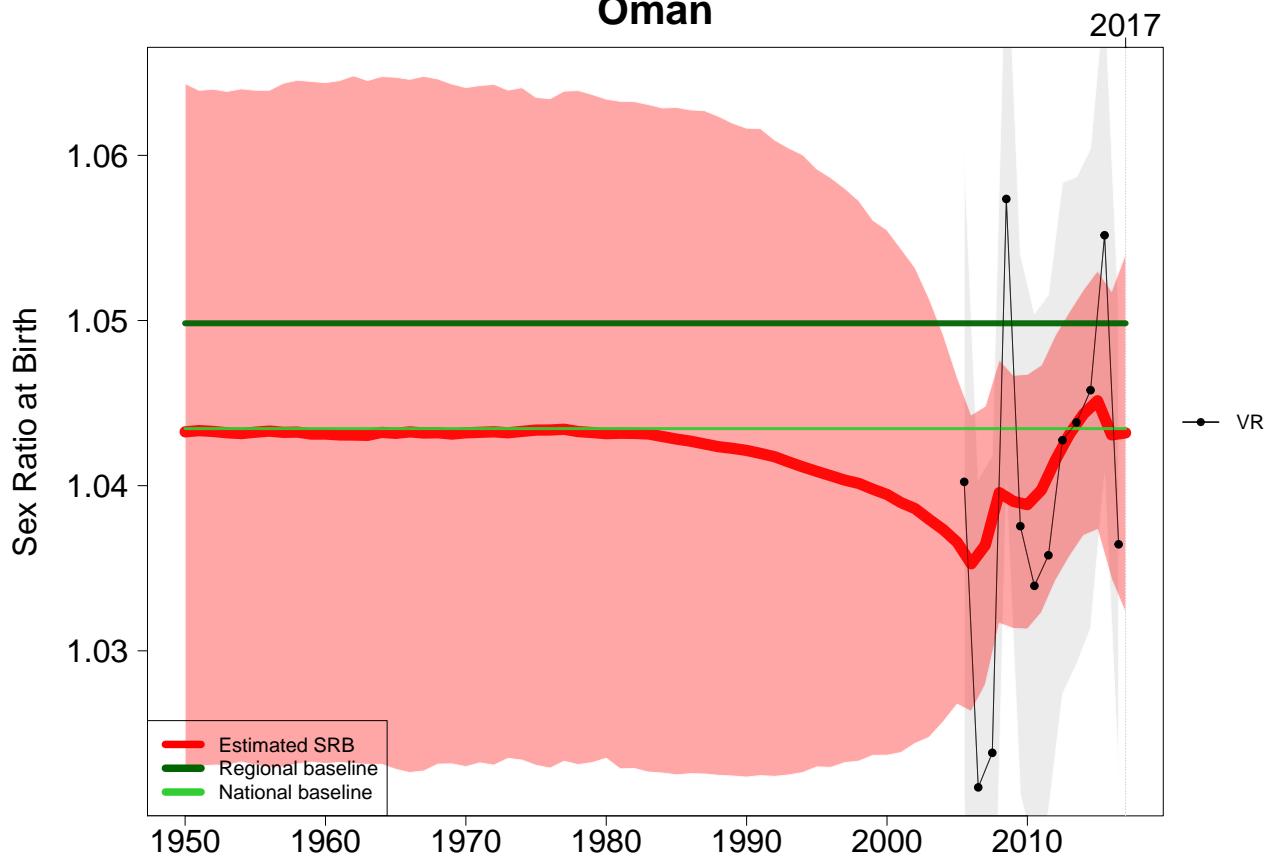


Norway

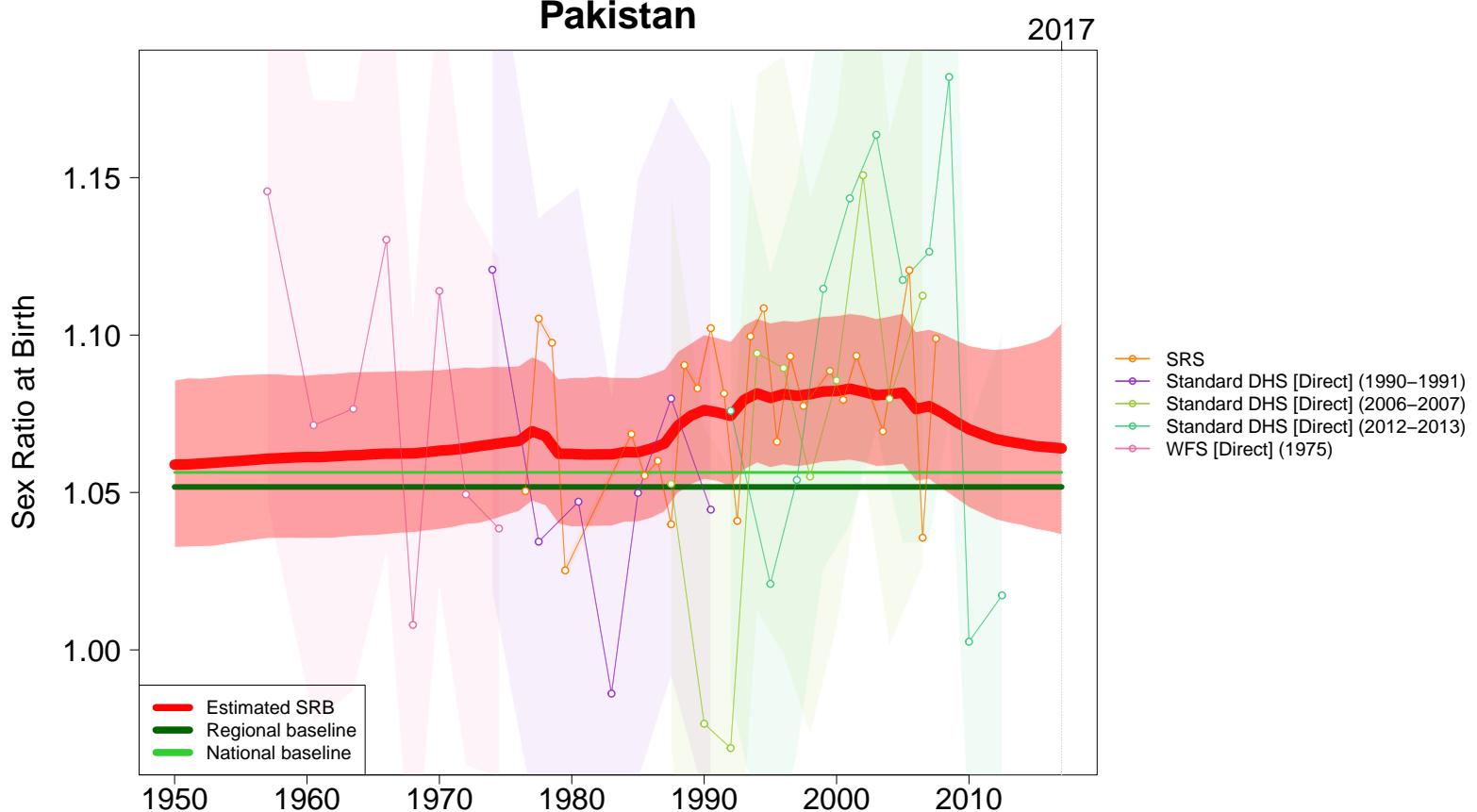
2017



Oman

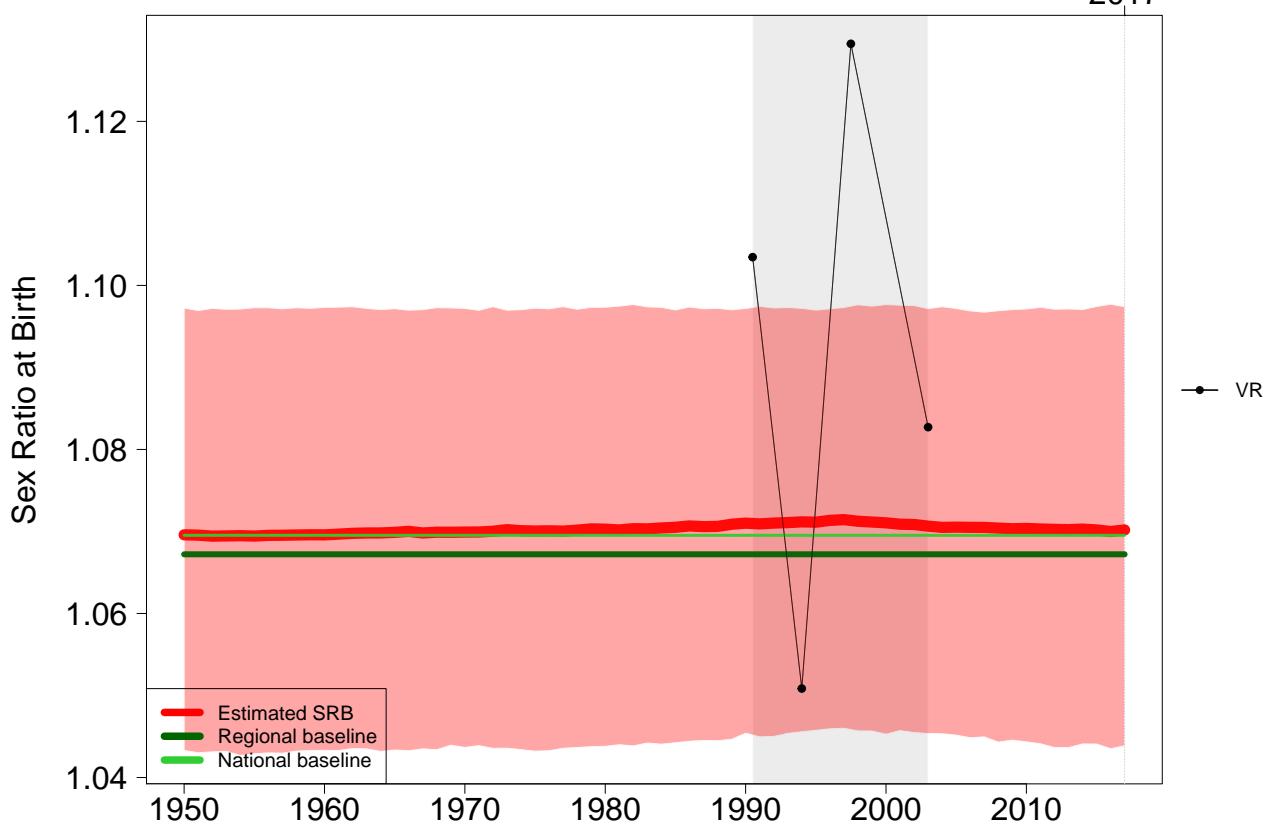


Pakistan



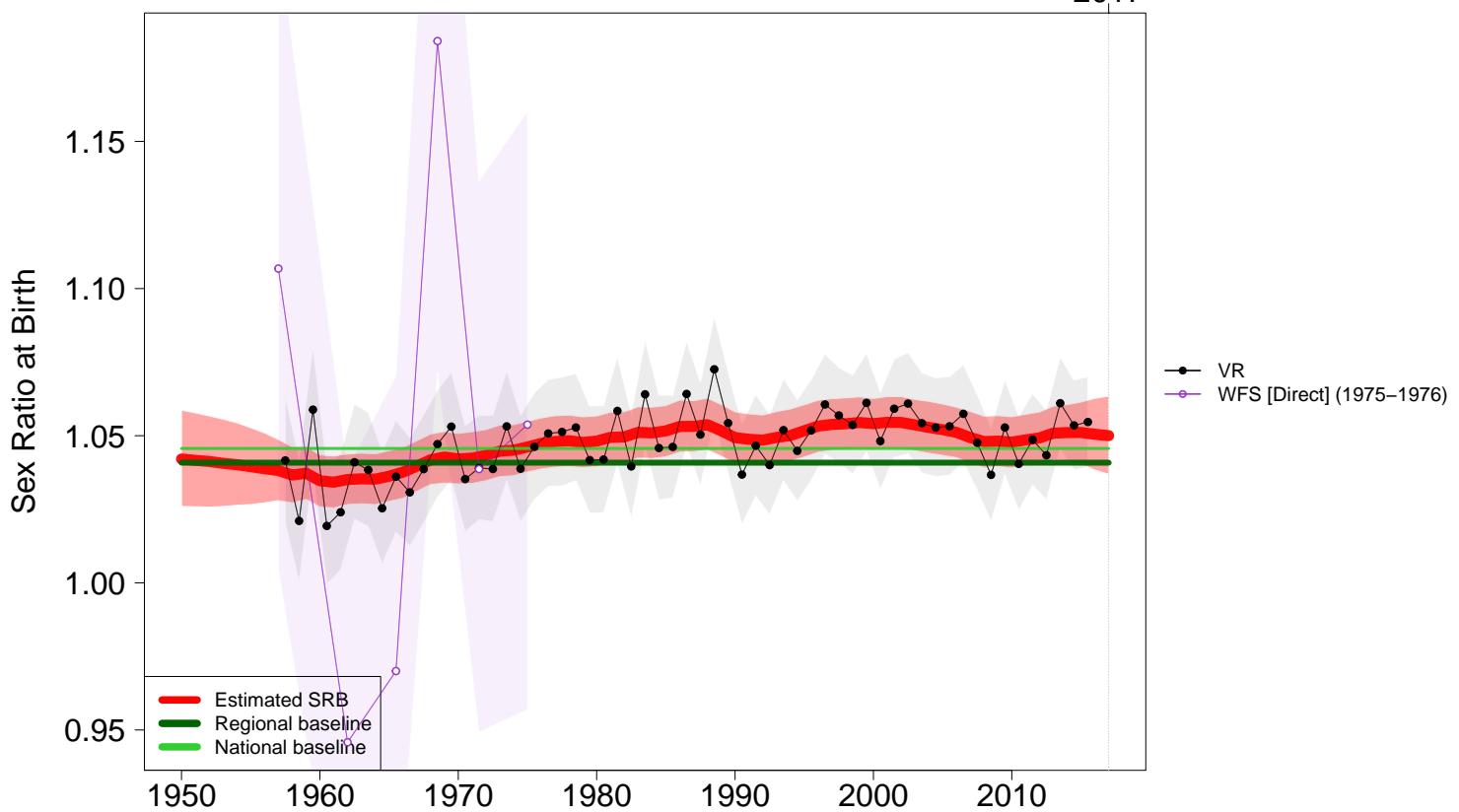
Palau

2017



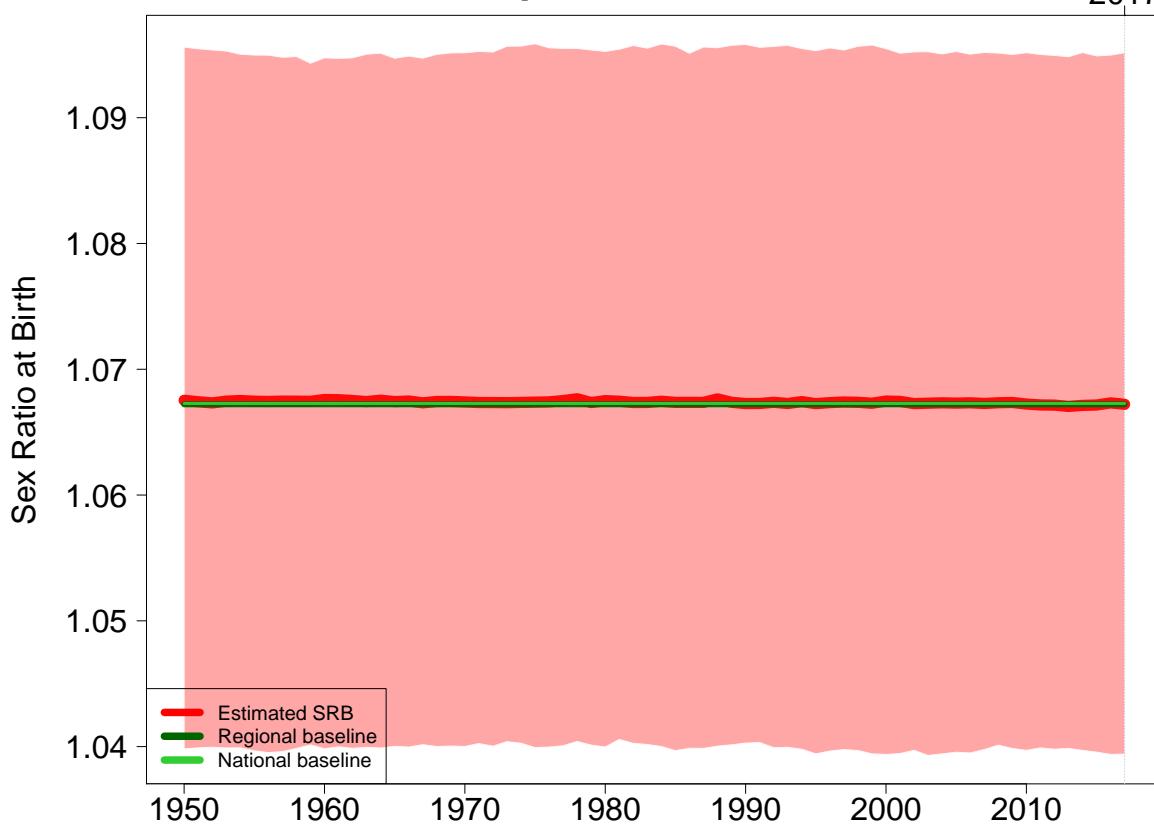
Panama

2017



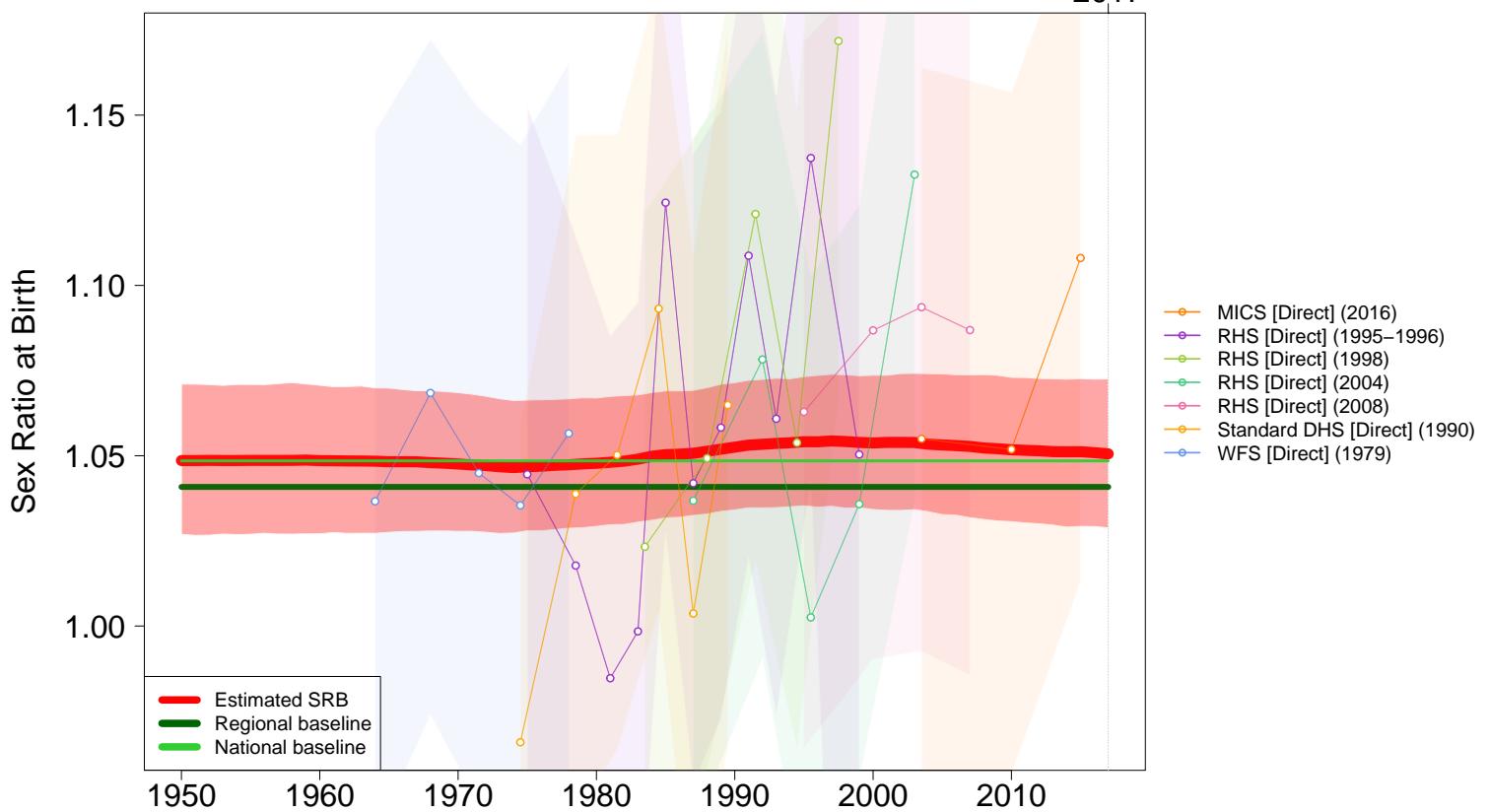
Papua New Guinea

2017



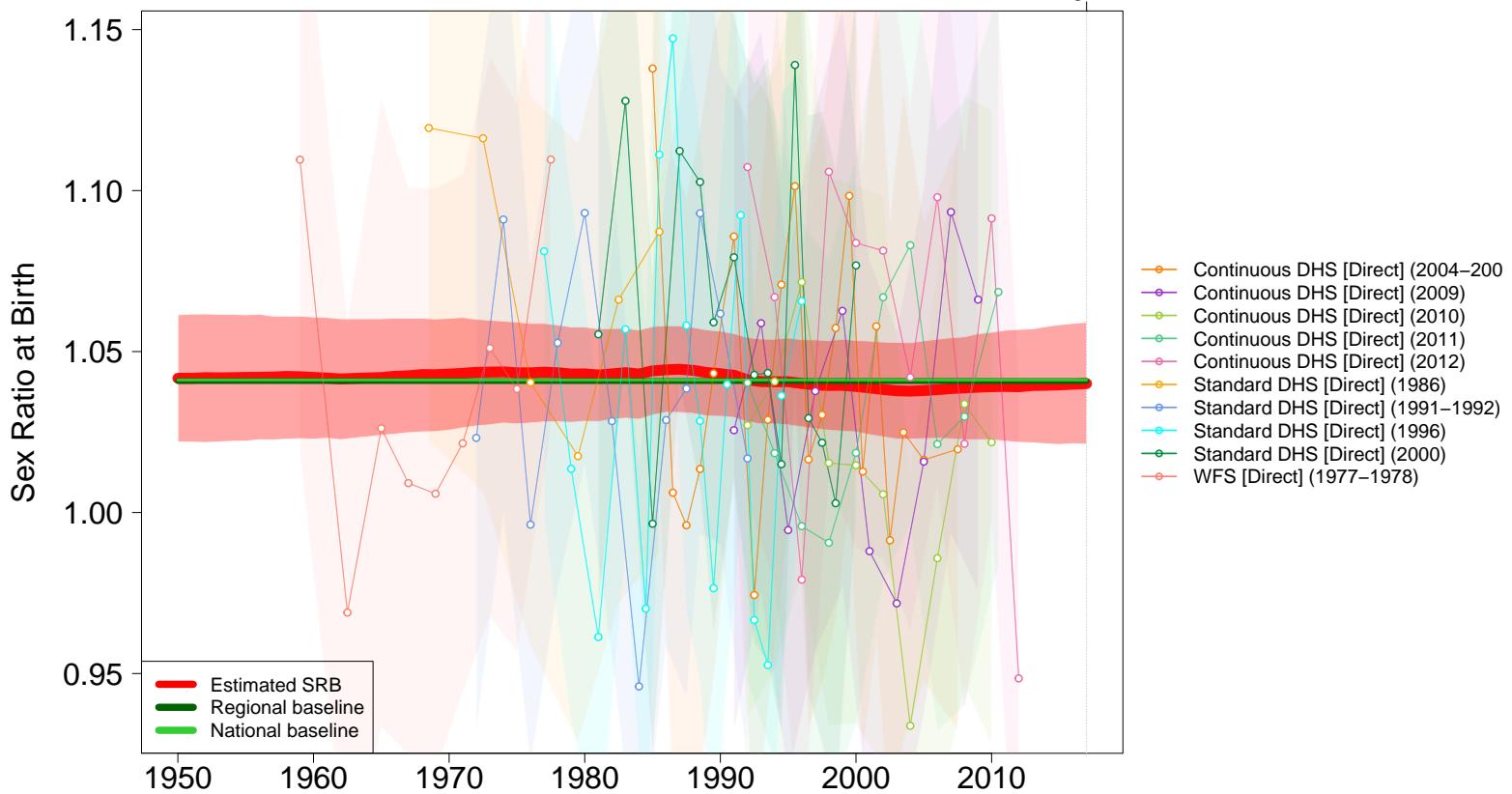
Paraguay

2017



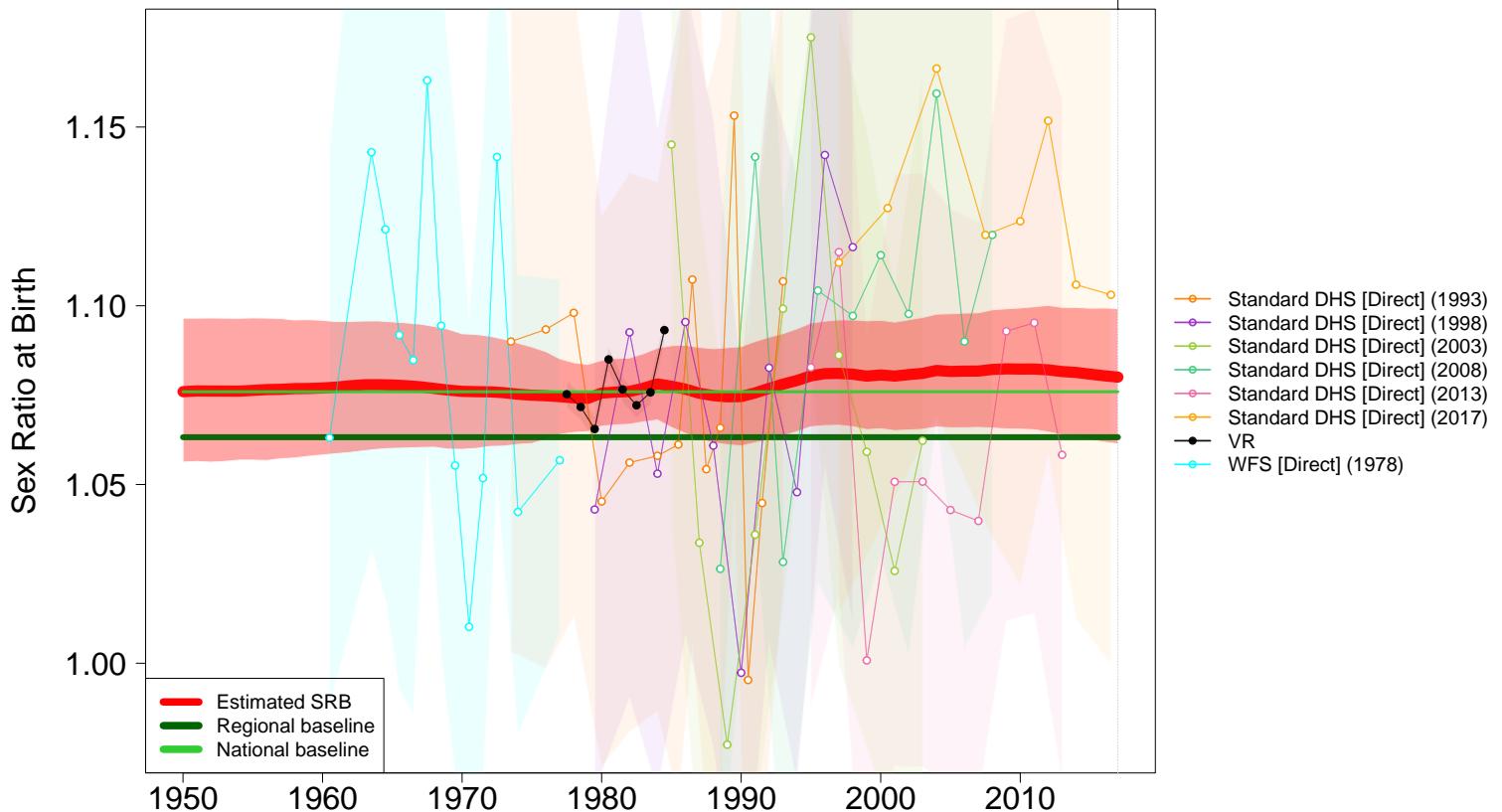
Peru

2017



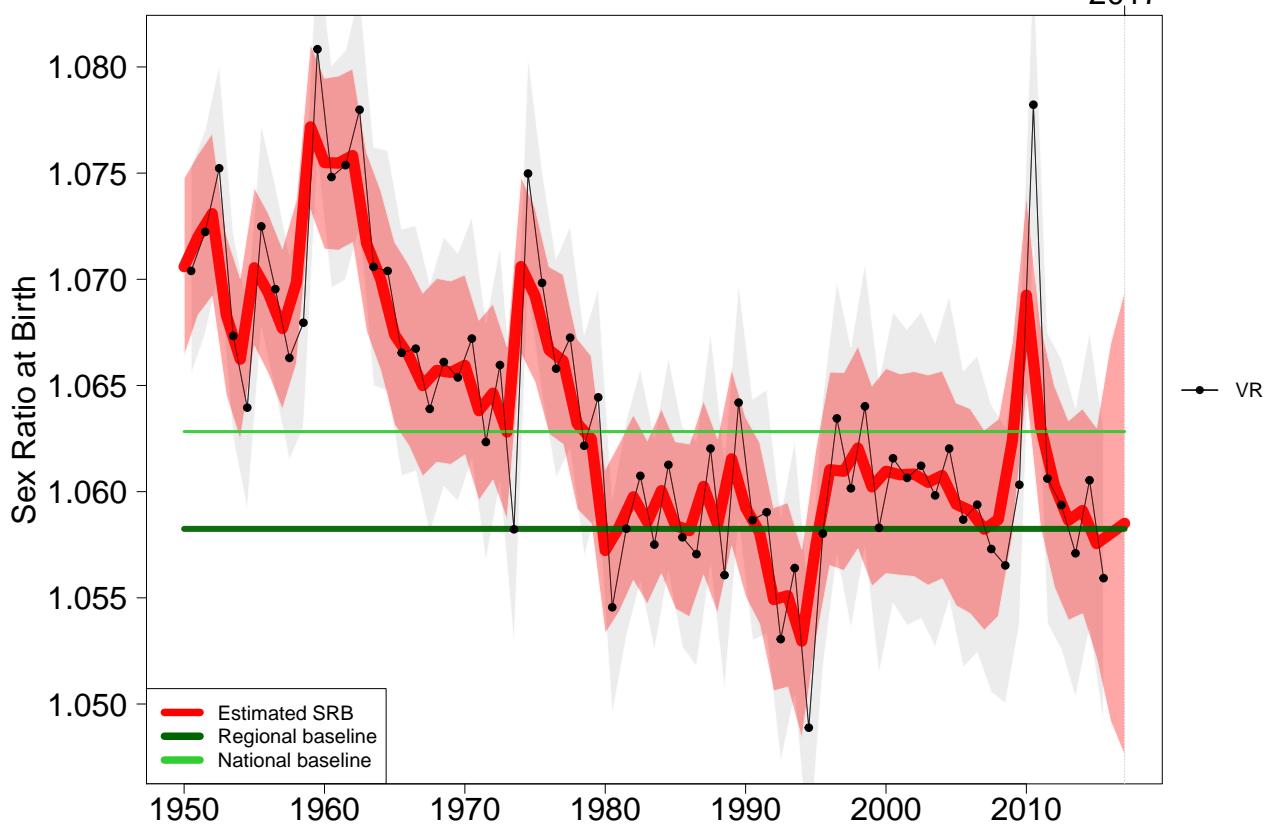
Philippines

2017



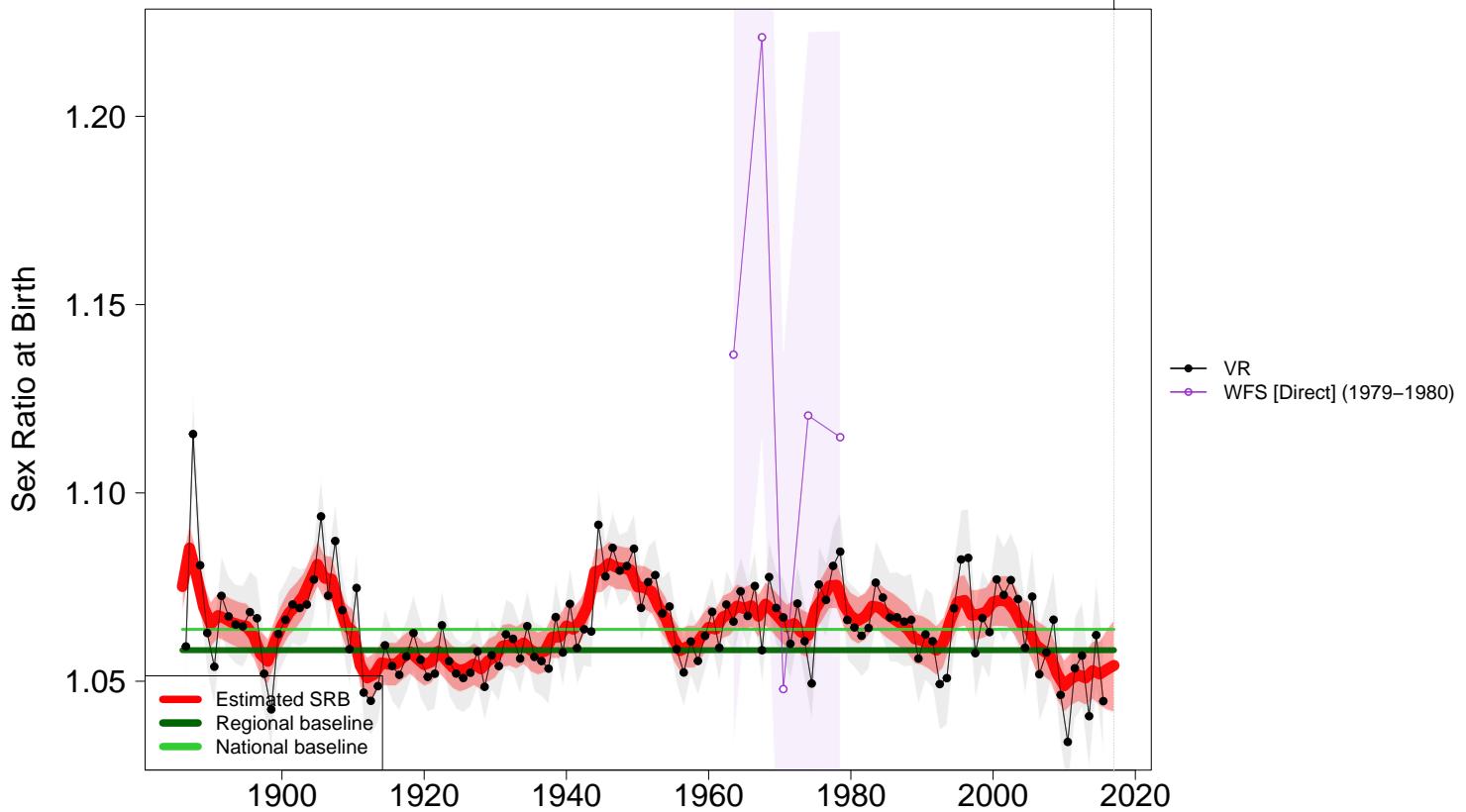
Poland

2017



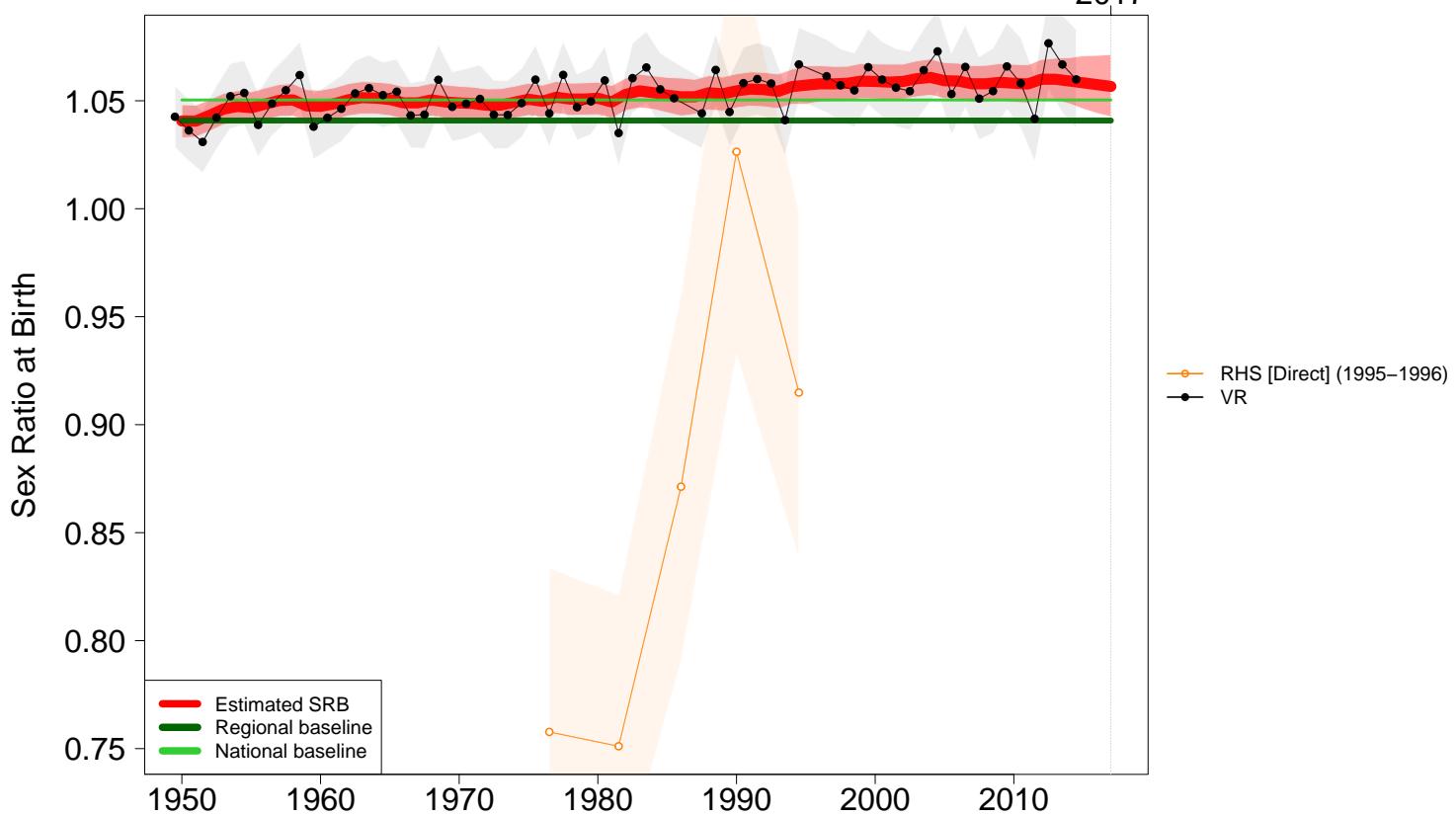
Portugal

2017



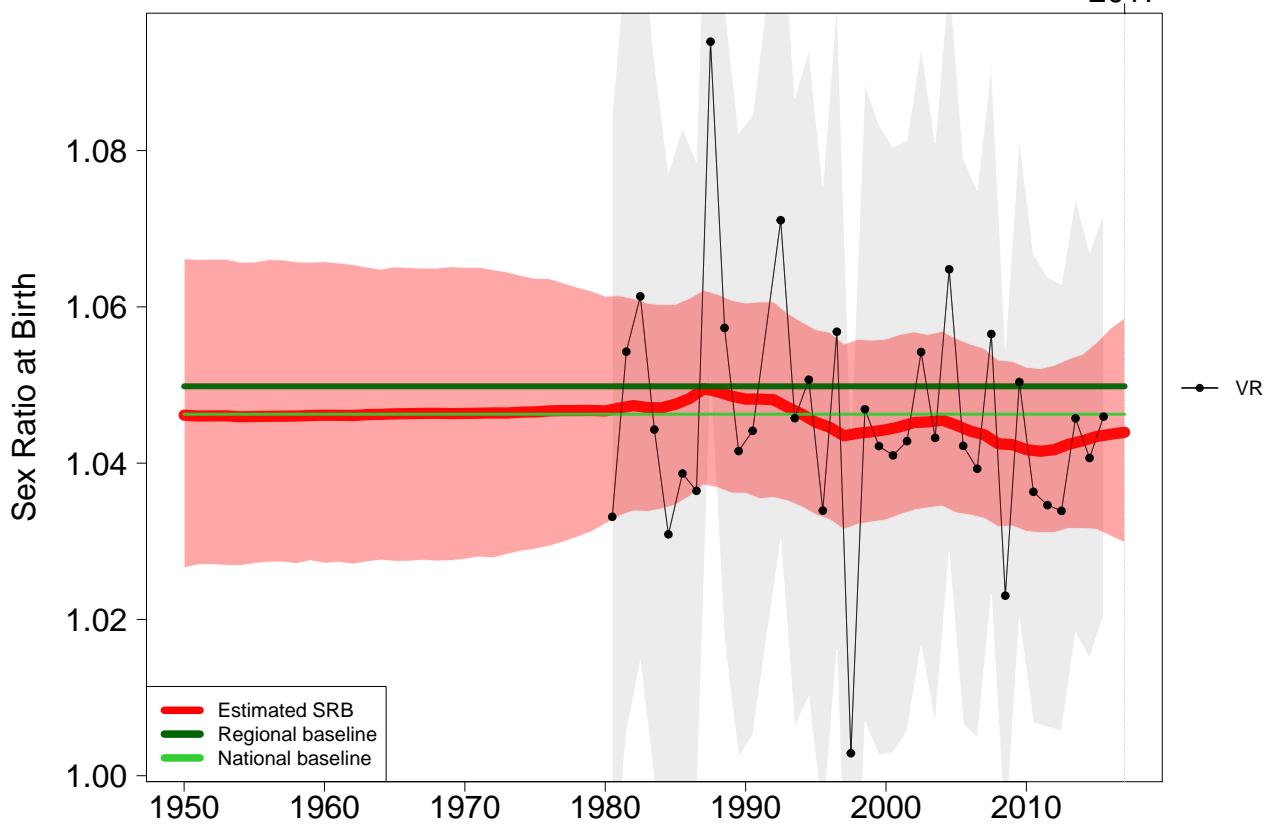
Puerto Rico

2017



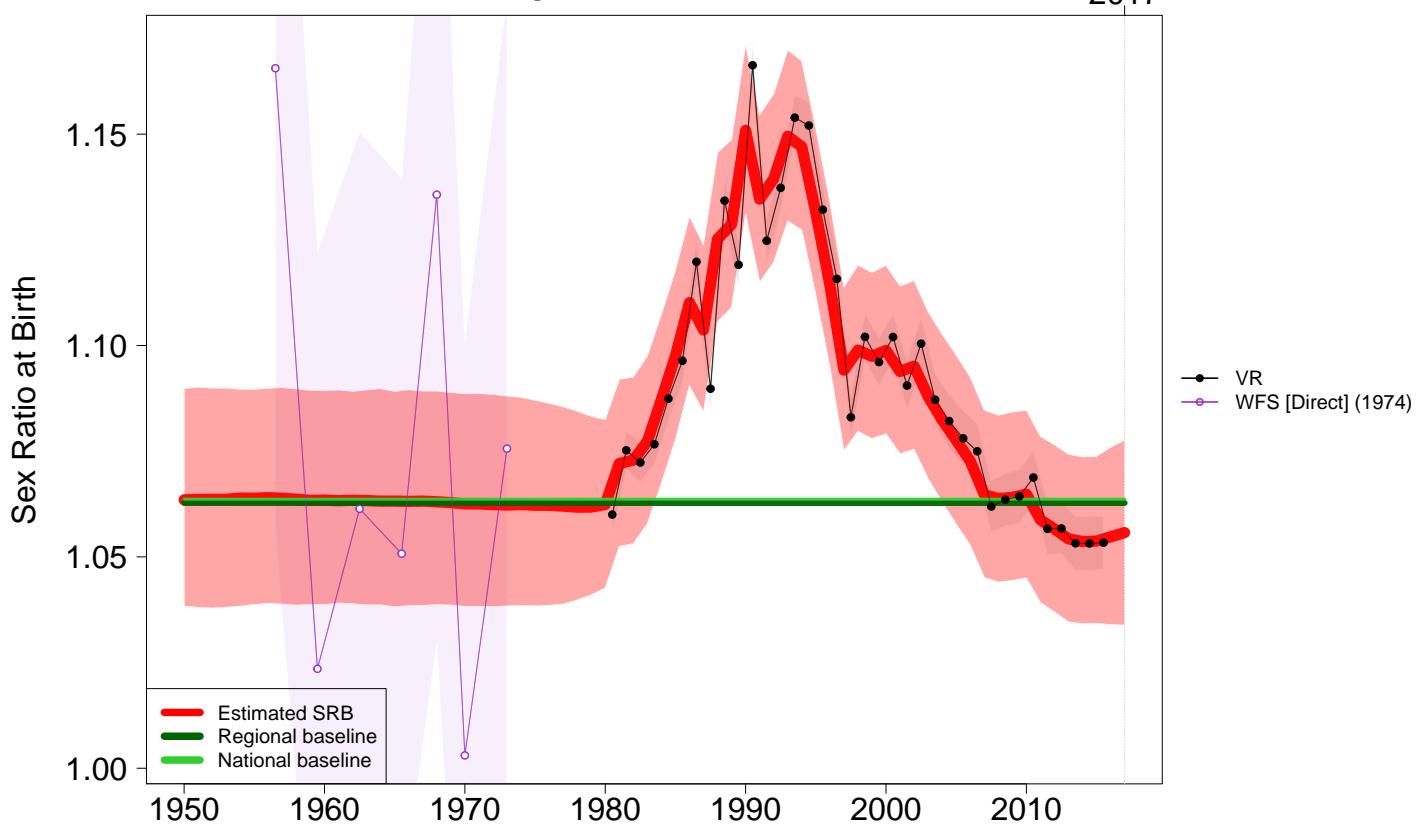
Qatar

2017



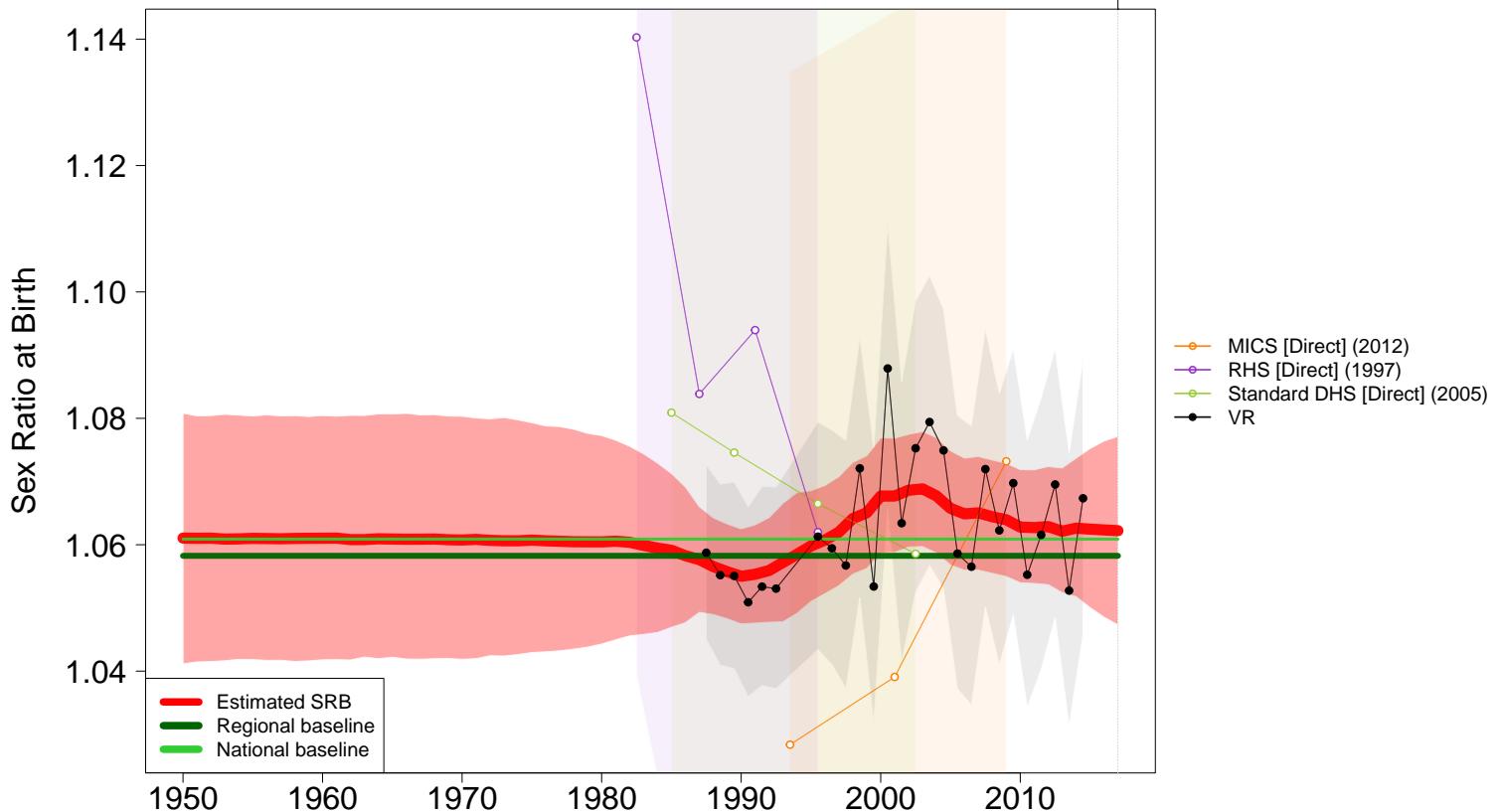
Republic of Korea

2017



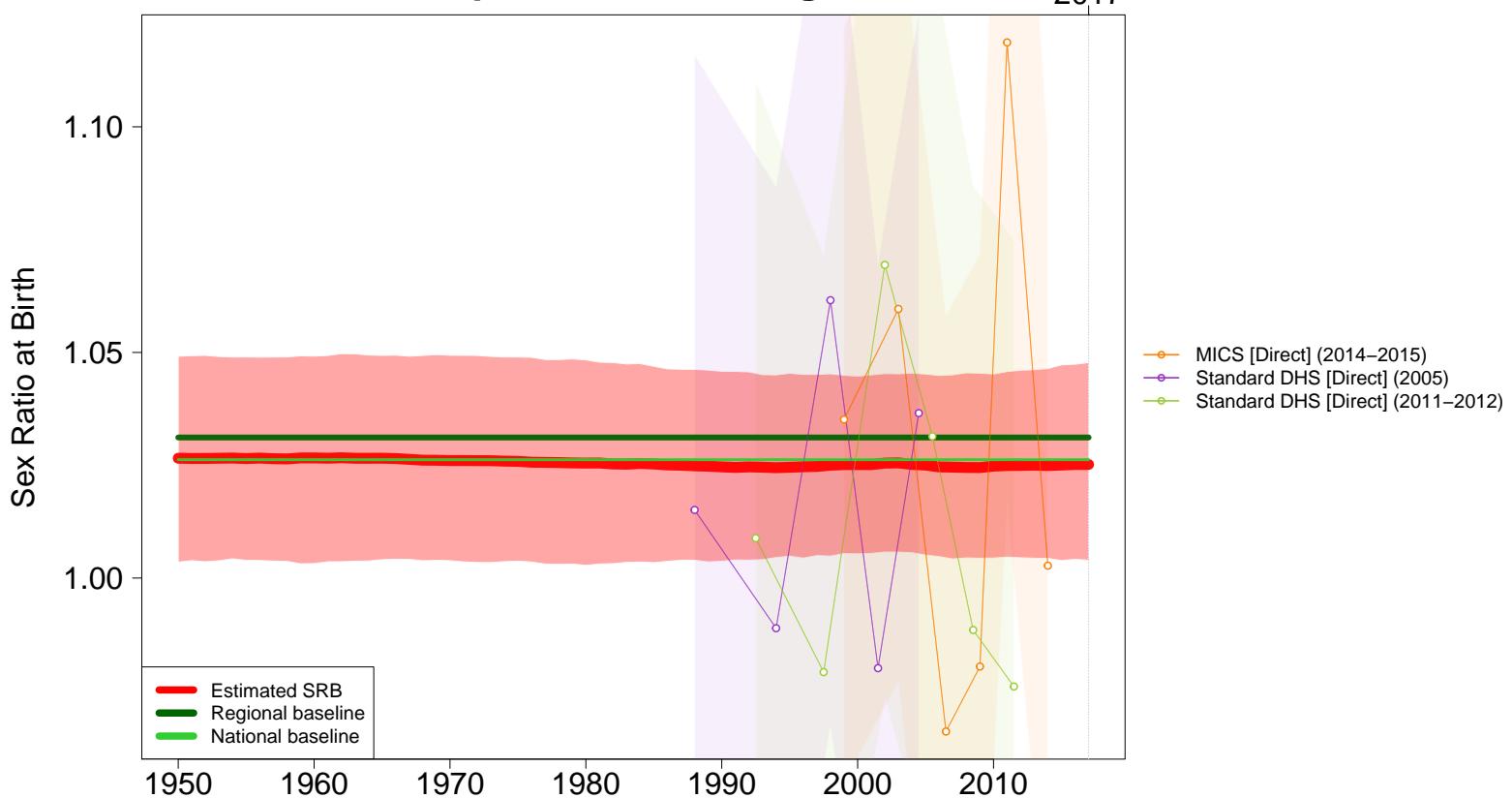
Republic of Moldova

2017



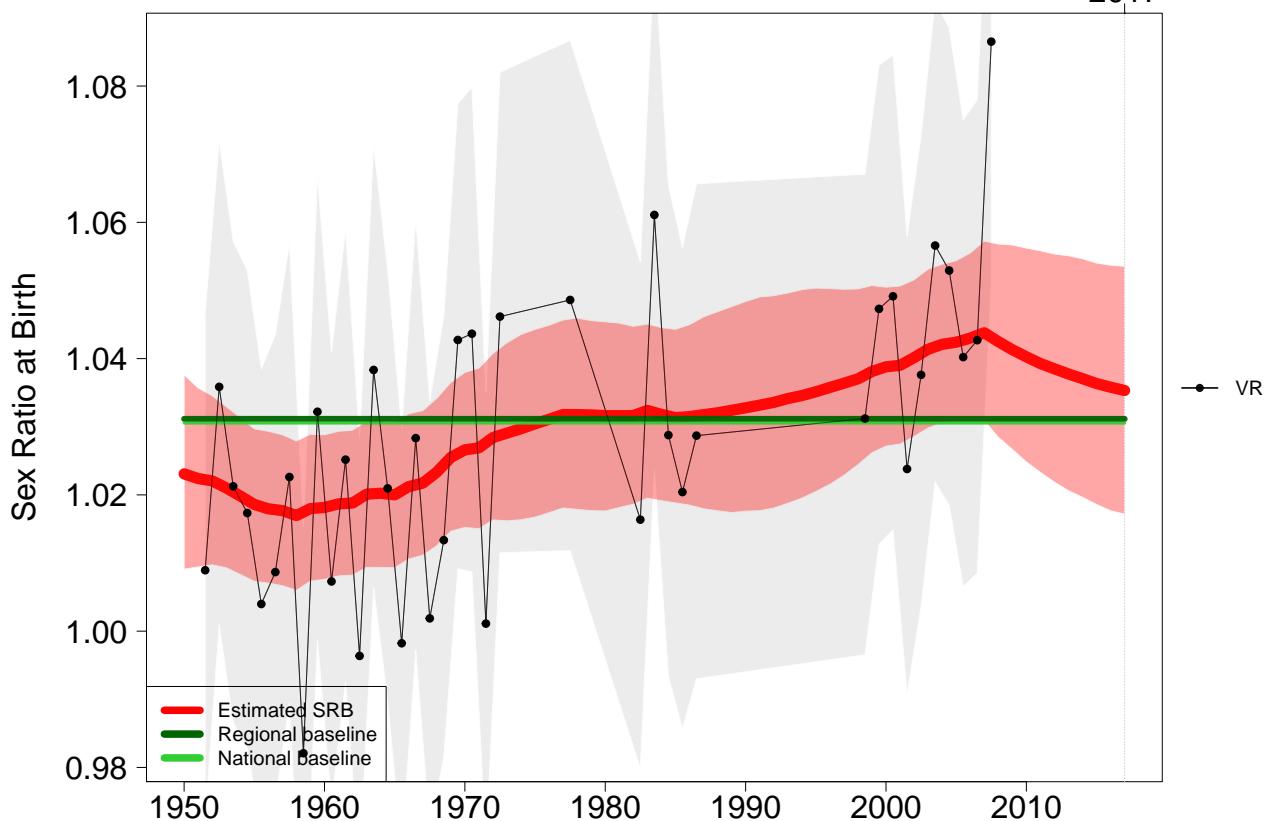
Republic of the Congo

2017



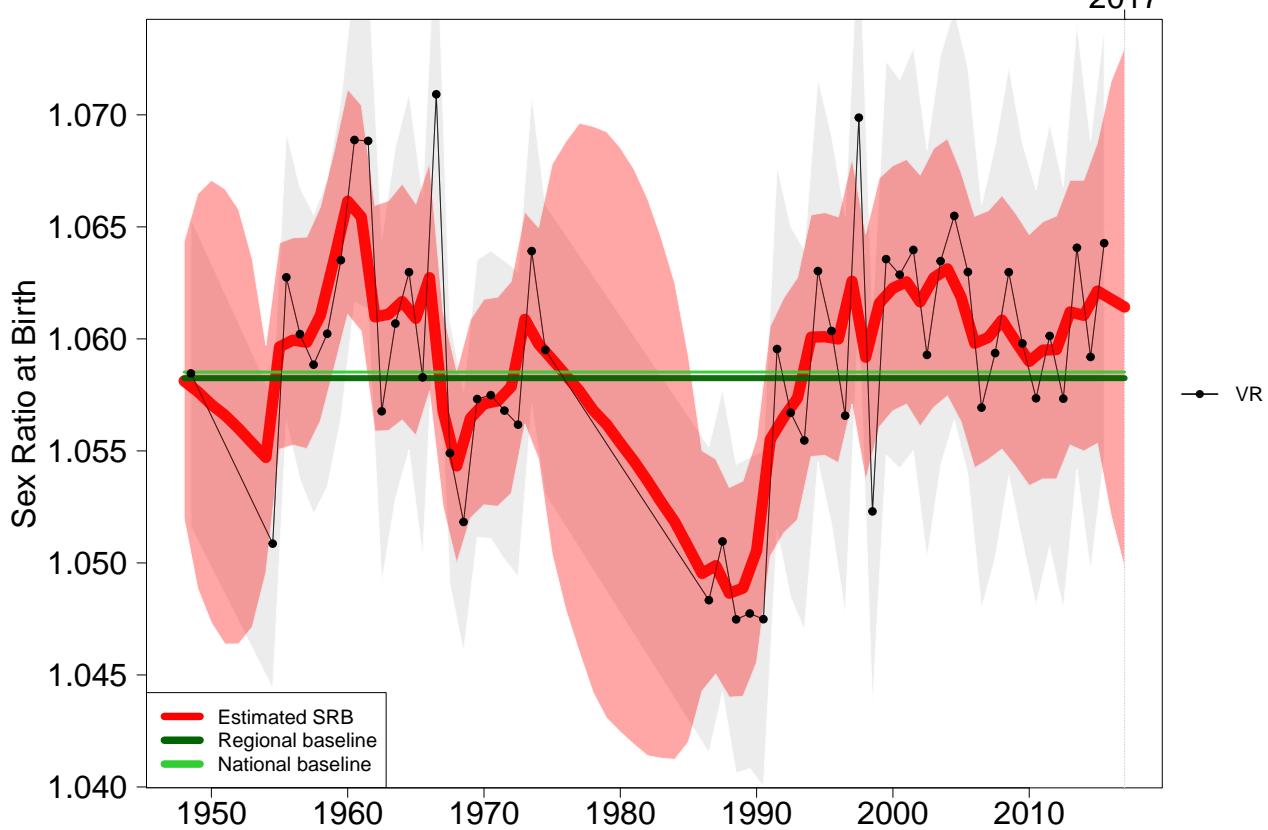
Reunion

2017



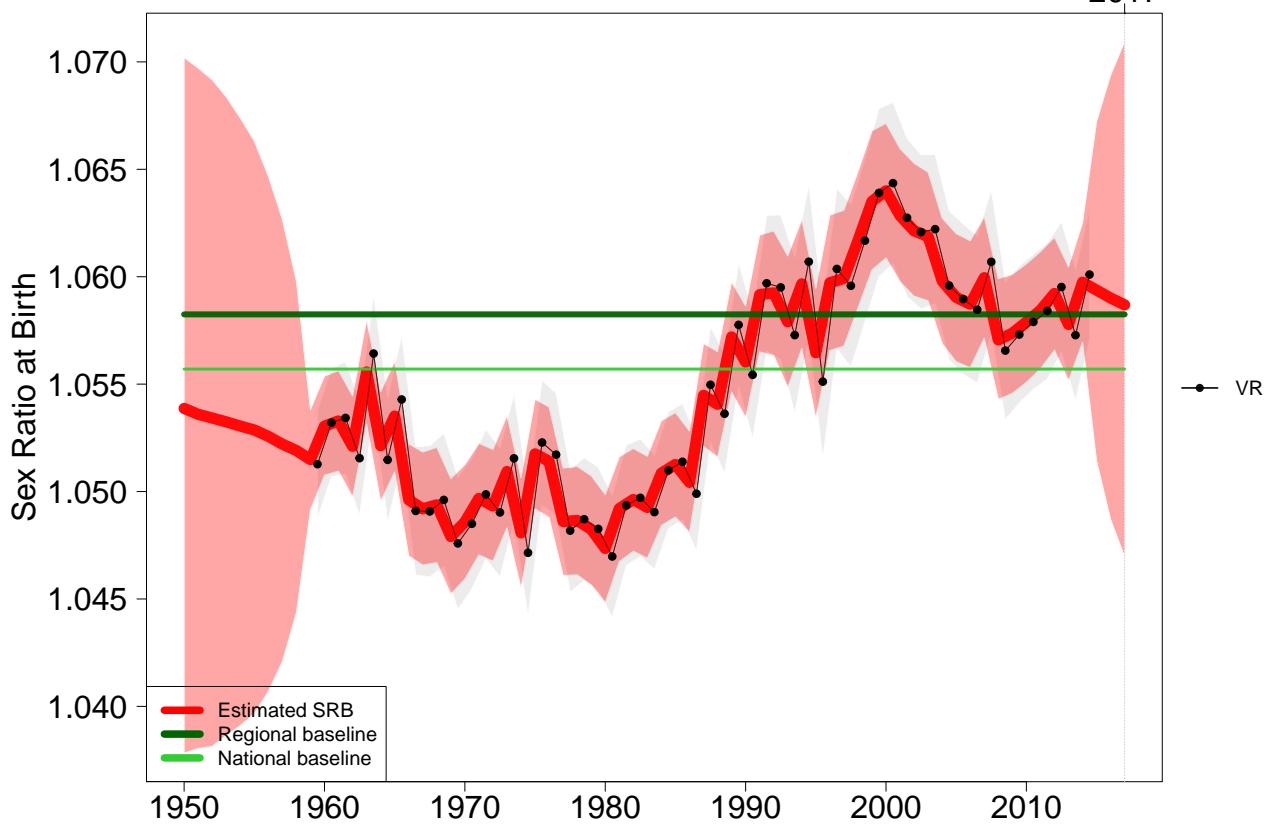
Romania

2017

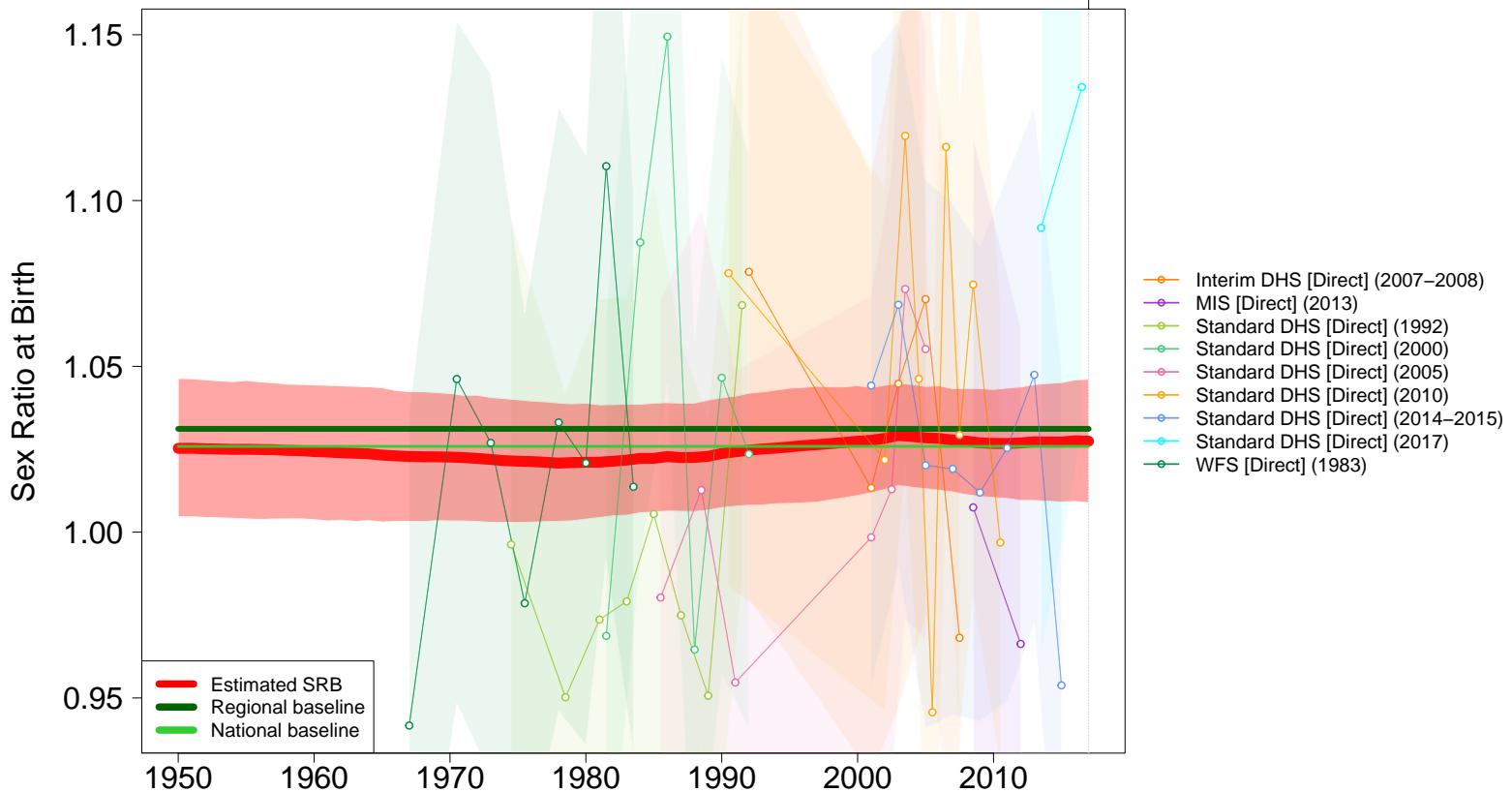


Russian Federation

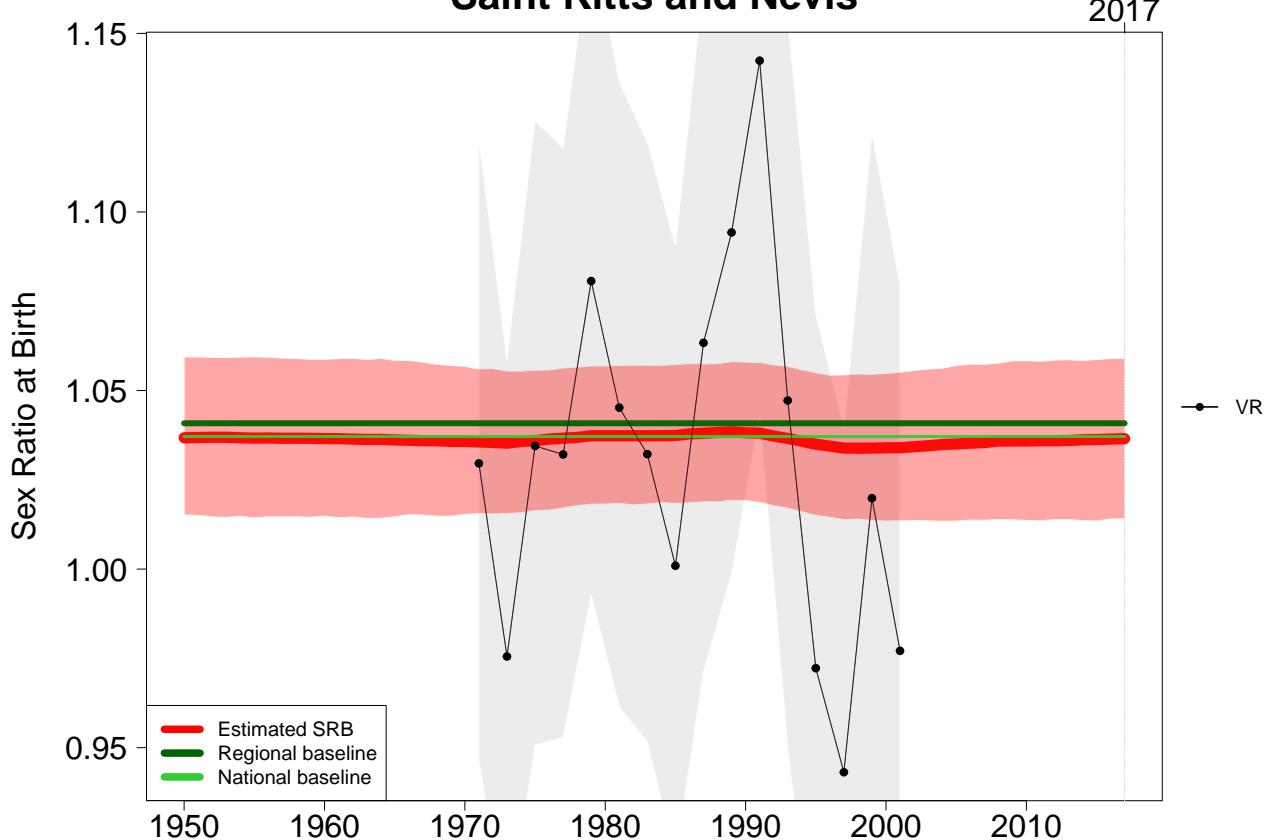
2017



Rwanda

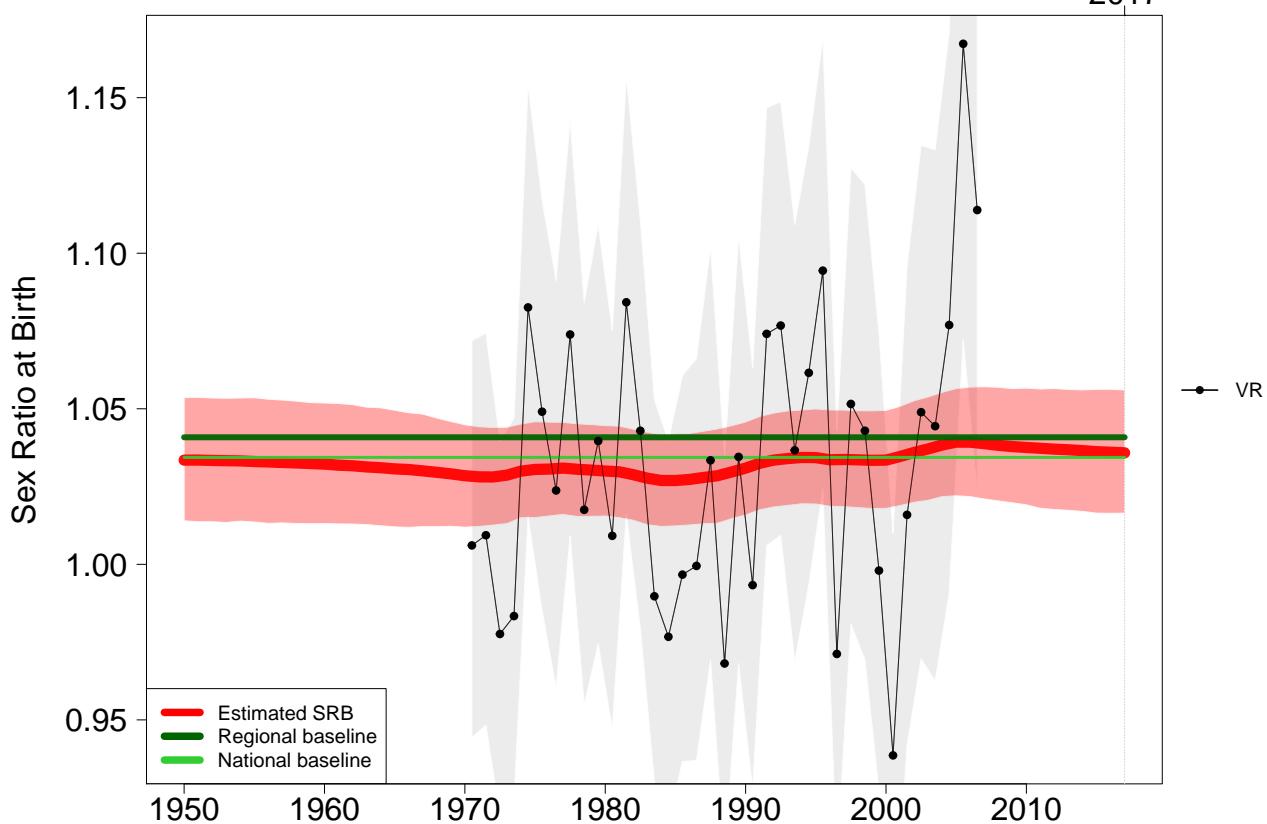


Saint Kitts and Nevis



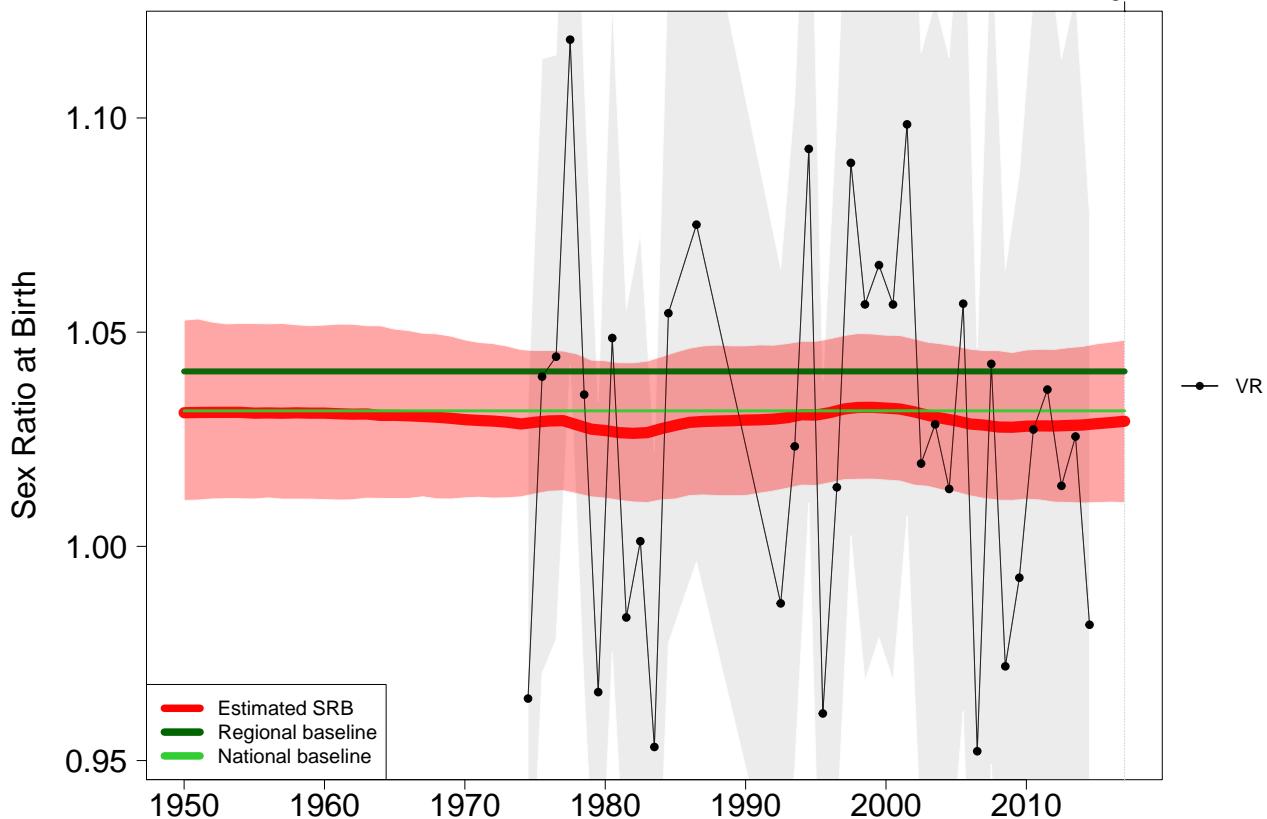
Saint Lucia

2017

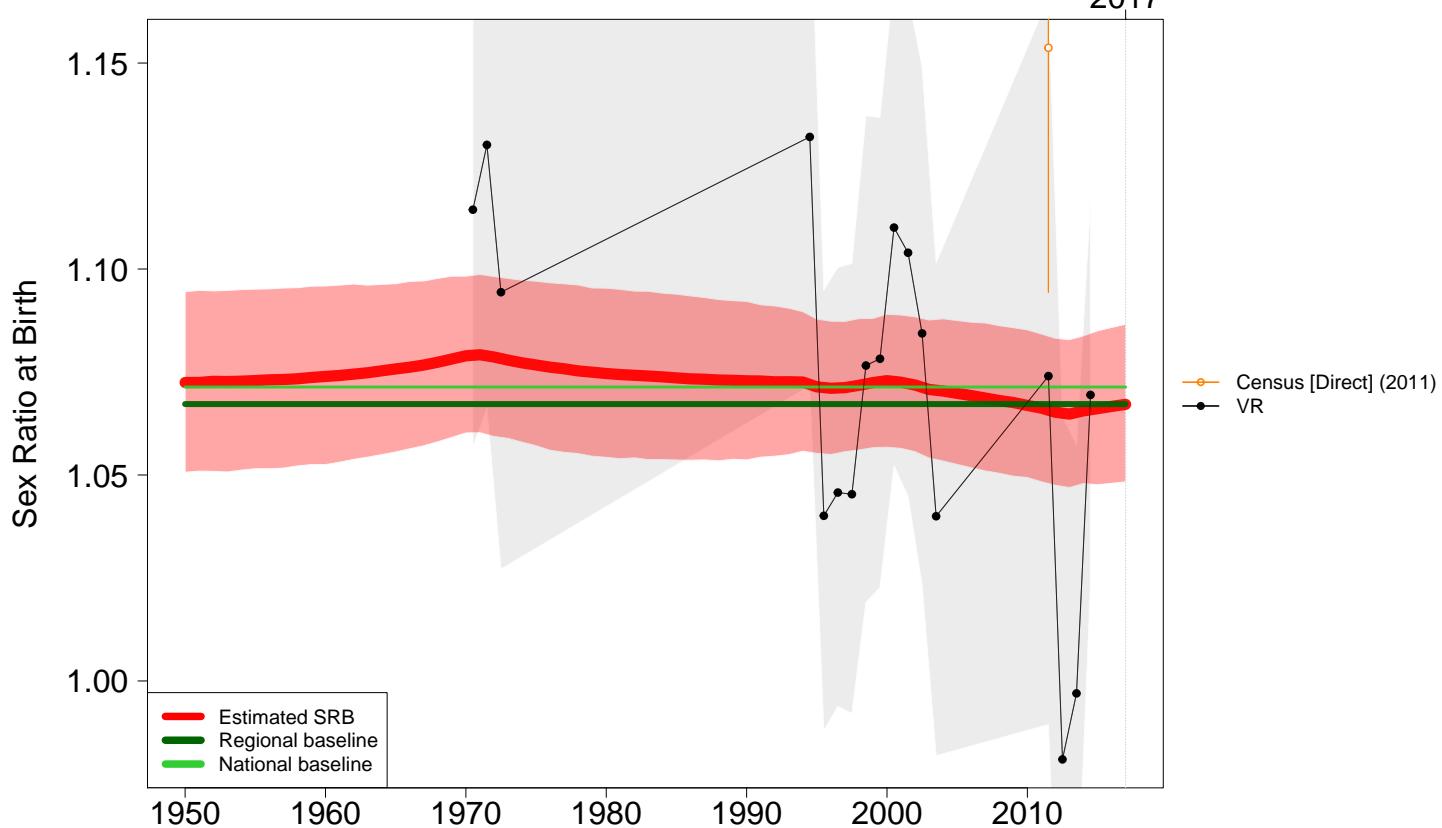


Saint Vincent and the Grenadines

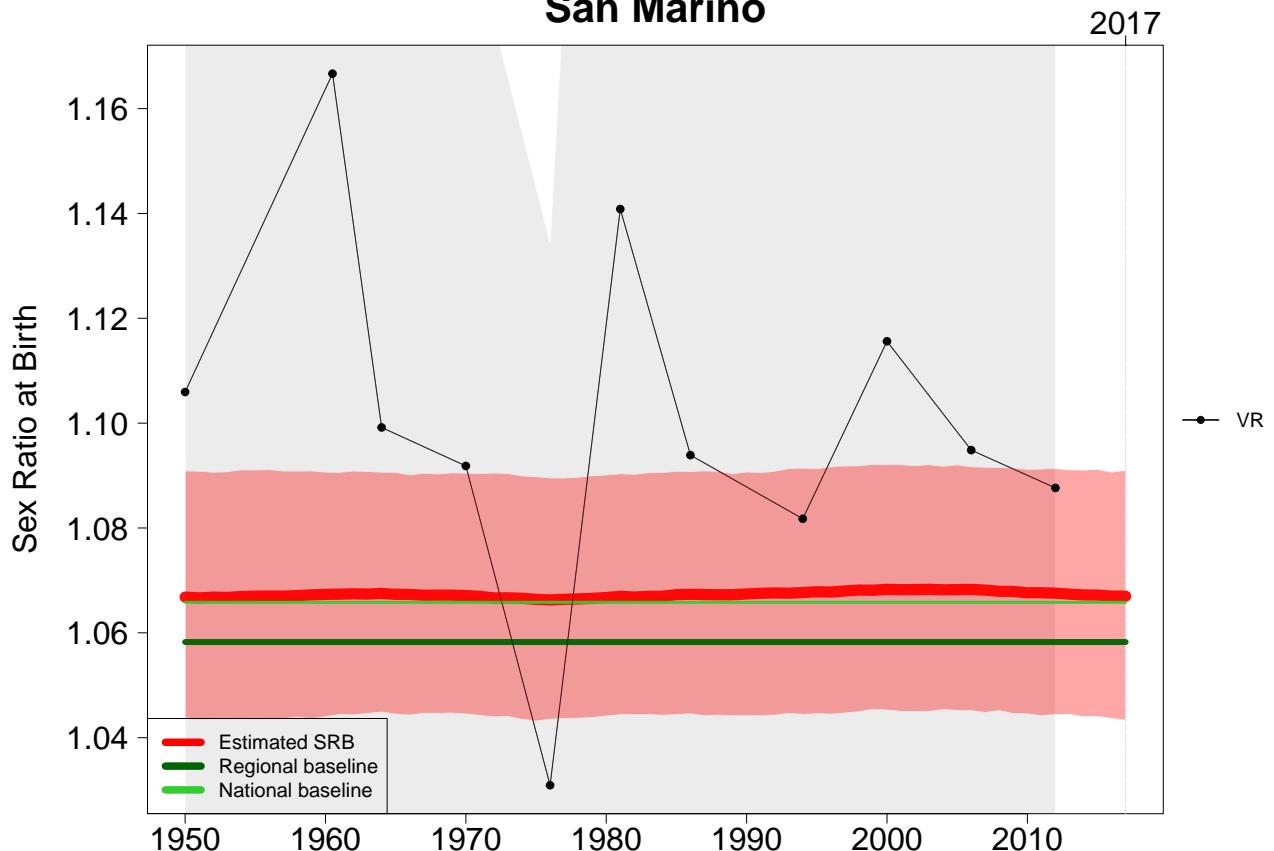
2017



Samoa

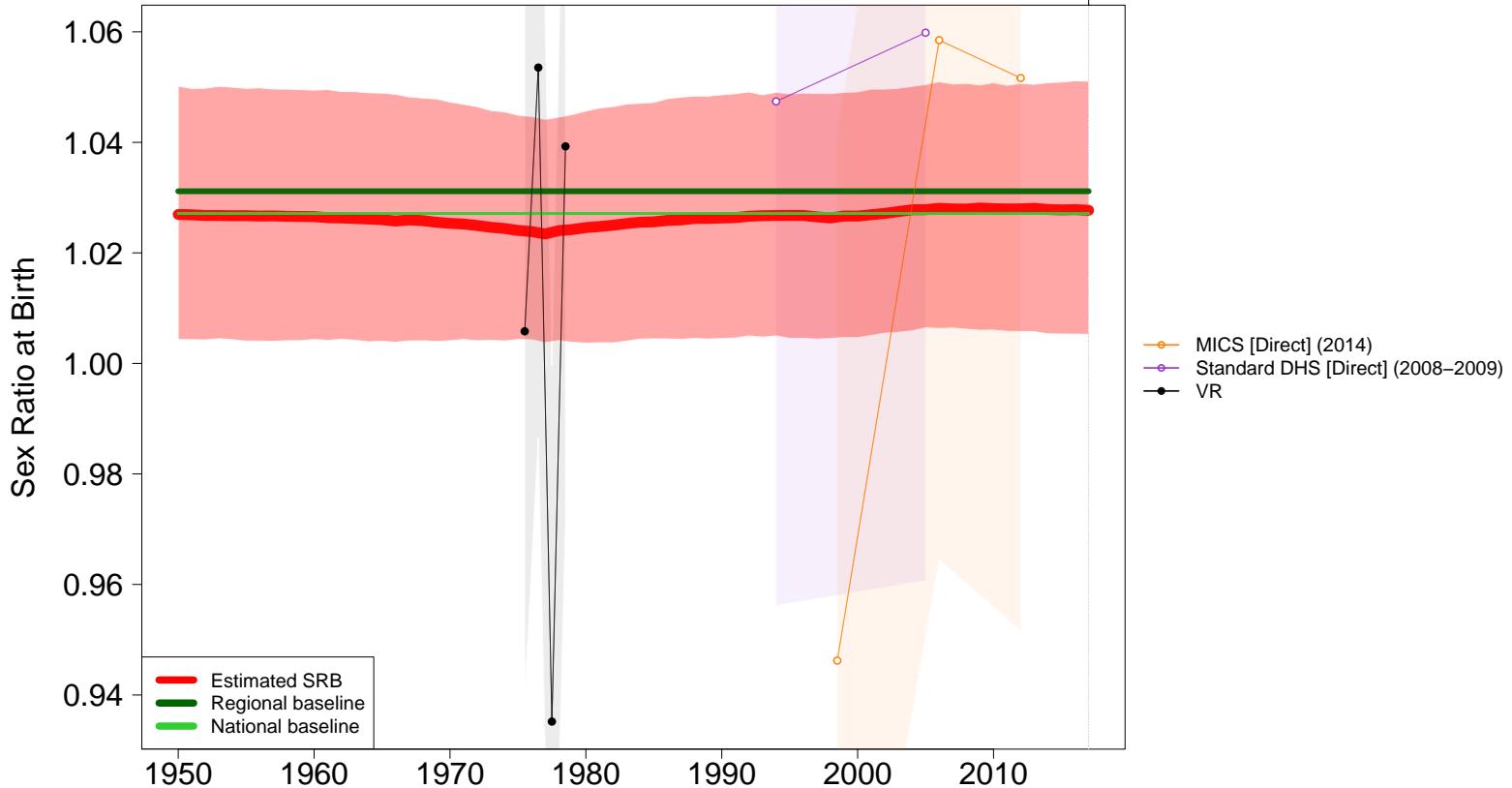


San Marino



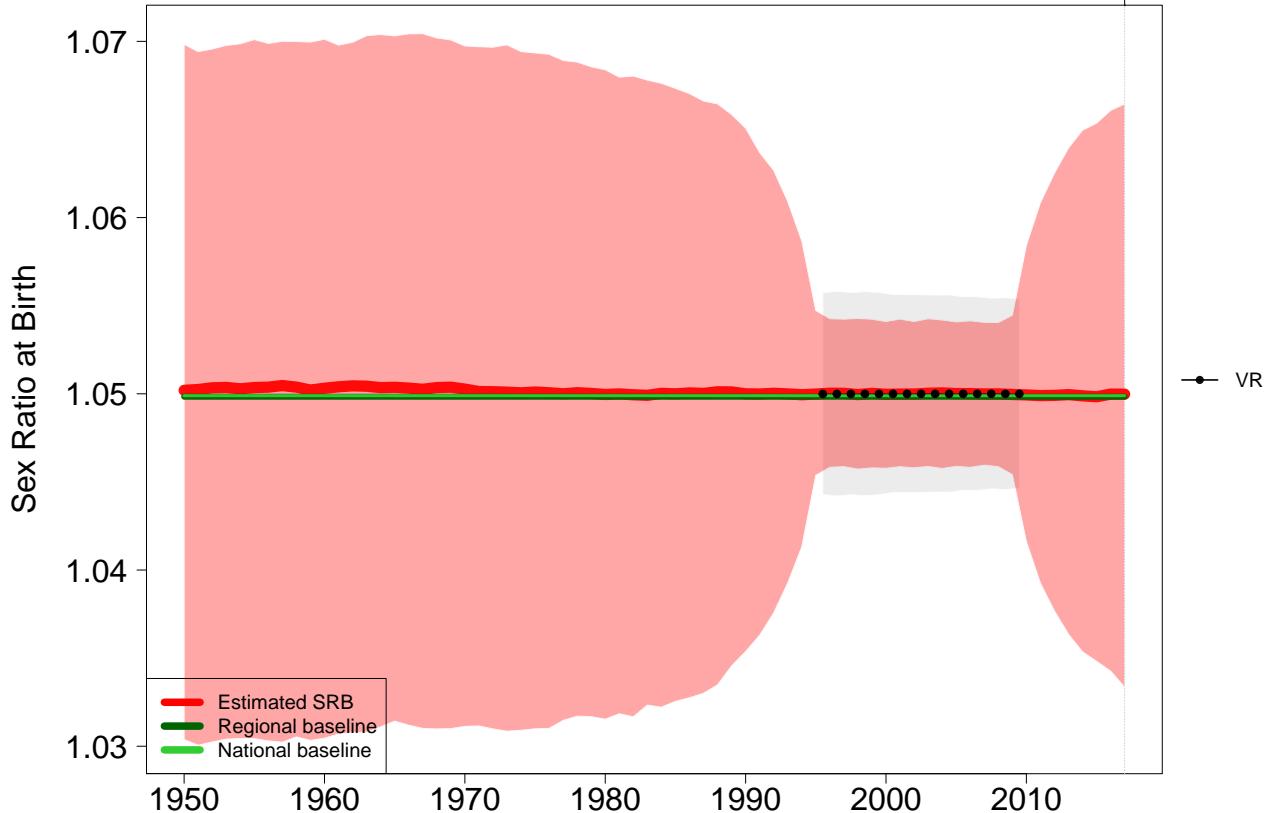
Sao Tome and Principe

2017



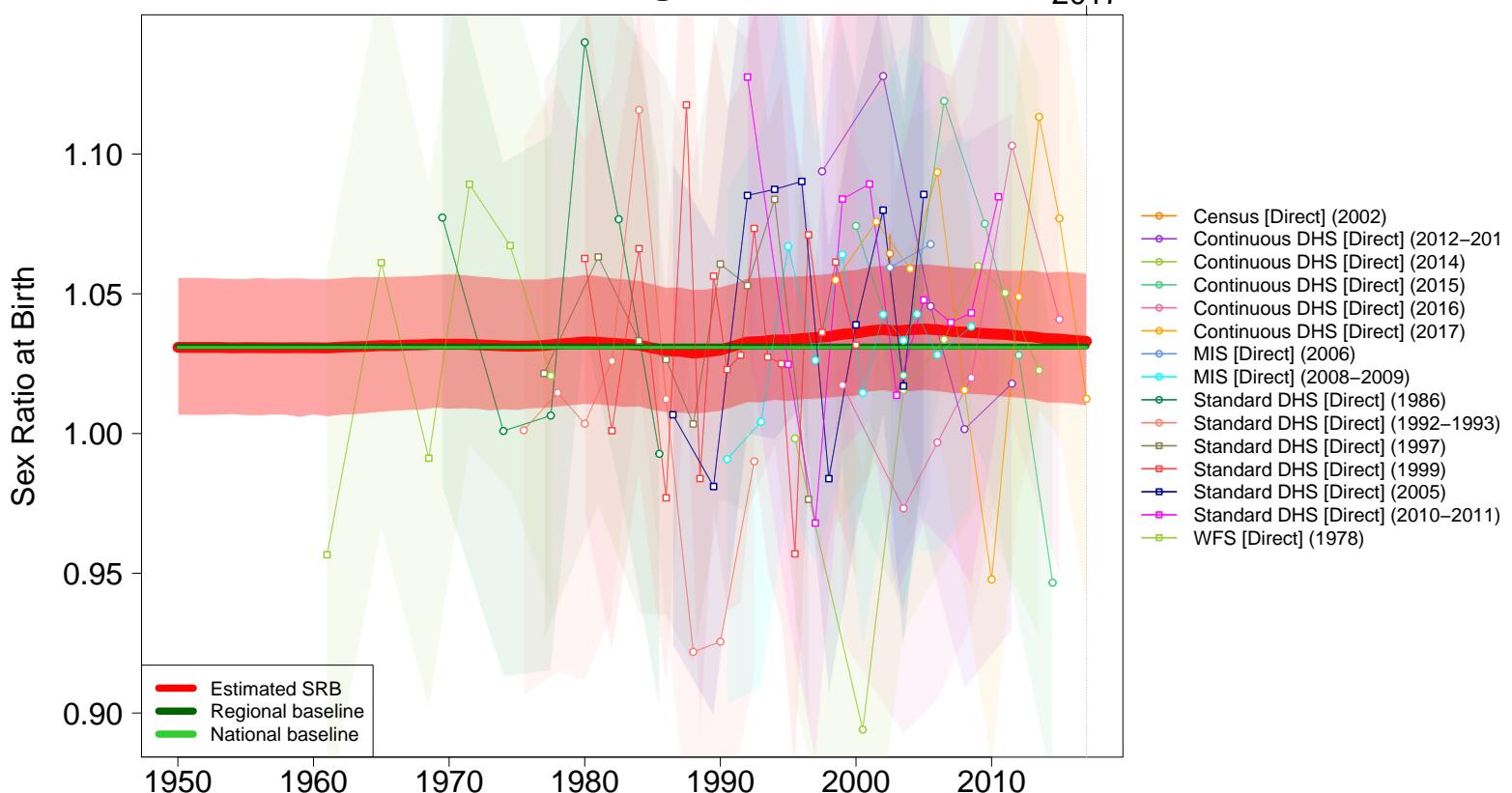
Saudi Arabia

2017



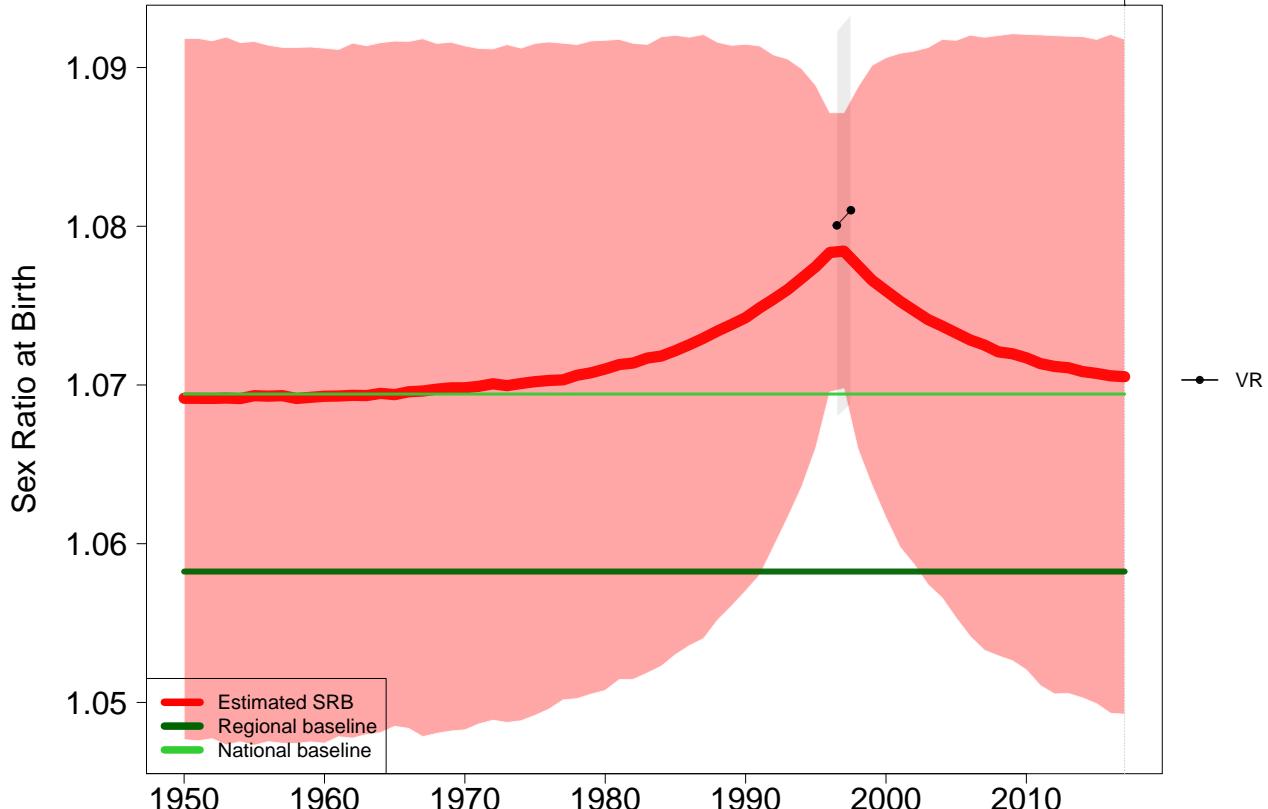
Senegal

2017



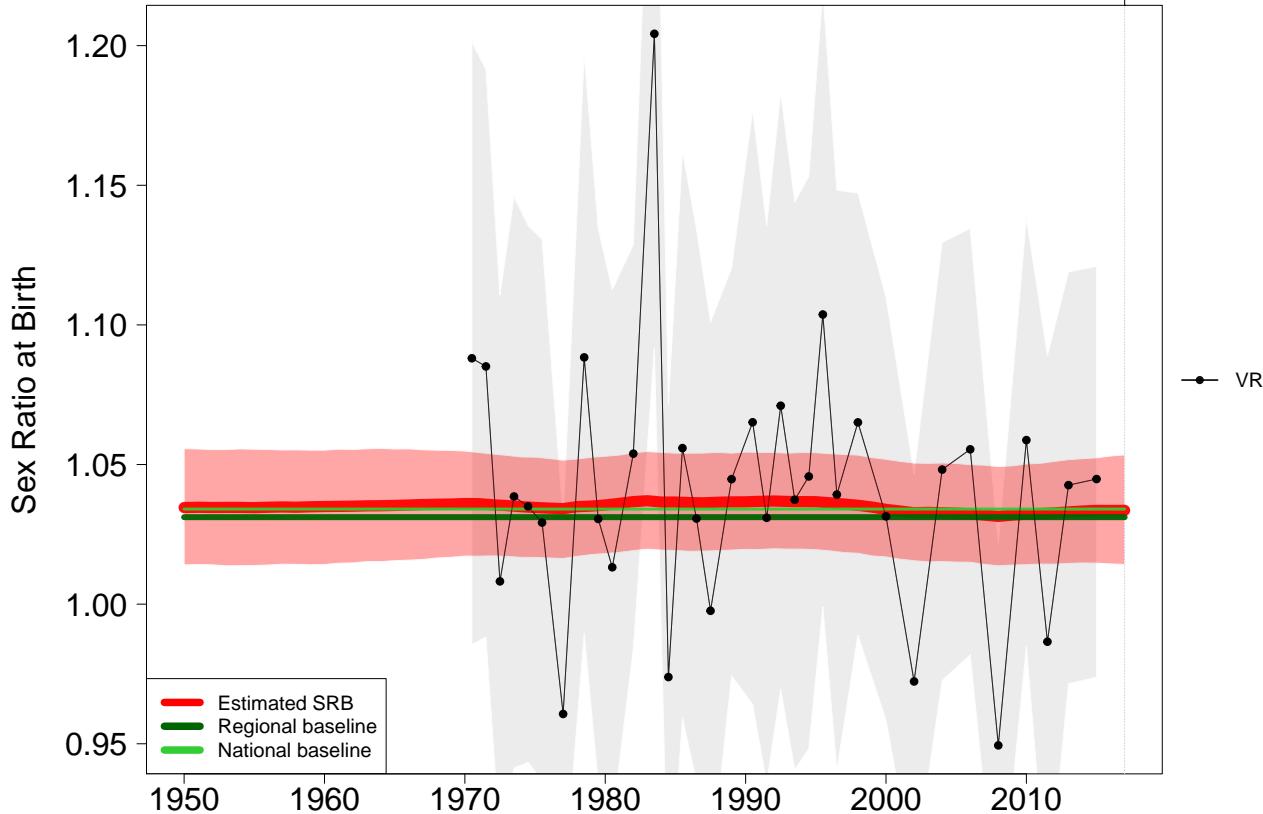
Serbia

2017



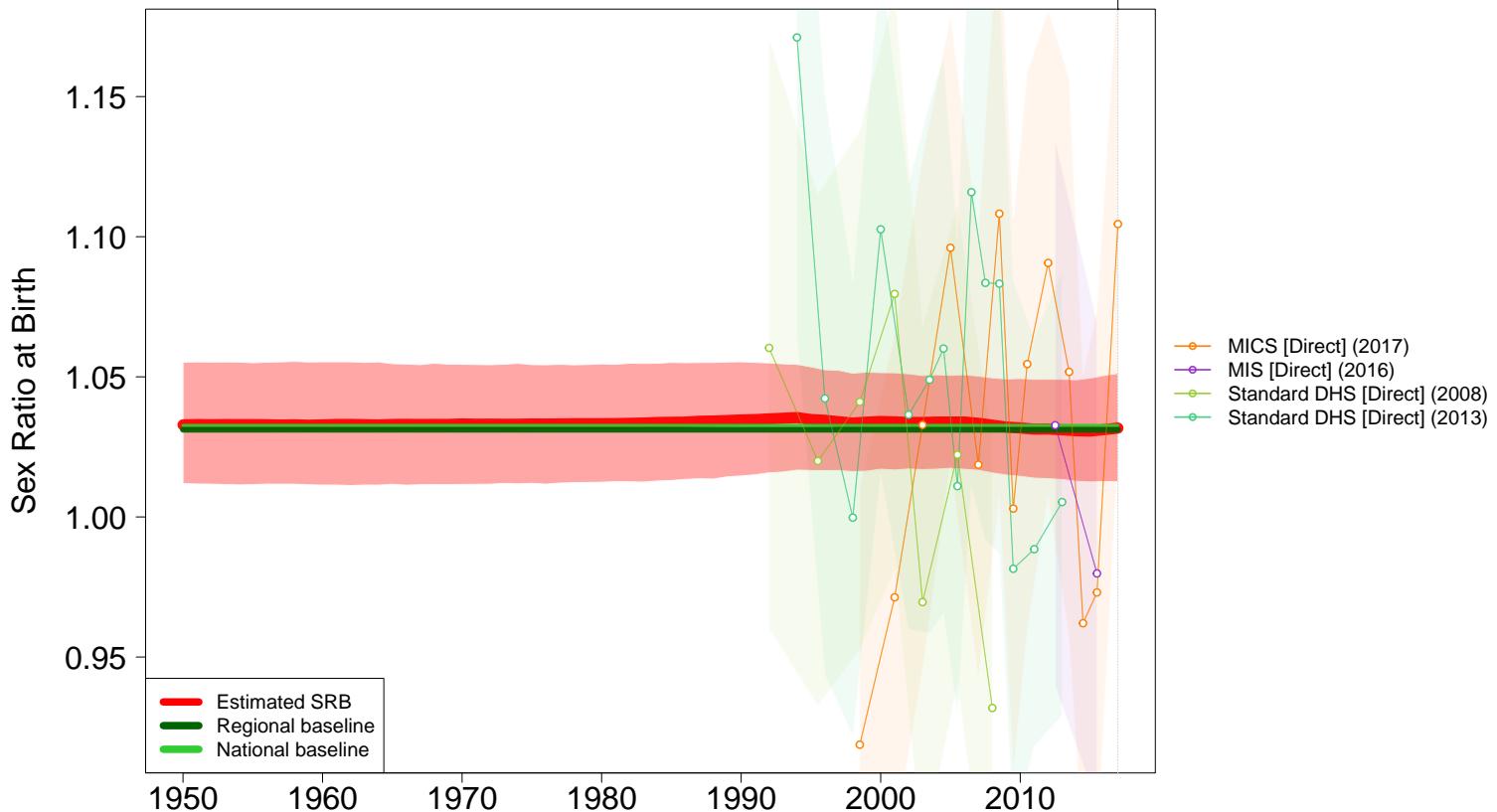
Seychelles

2017



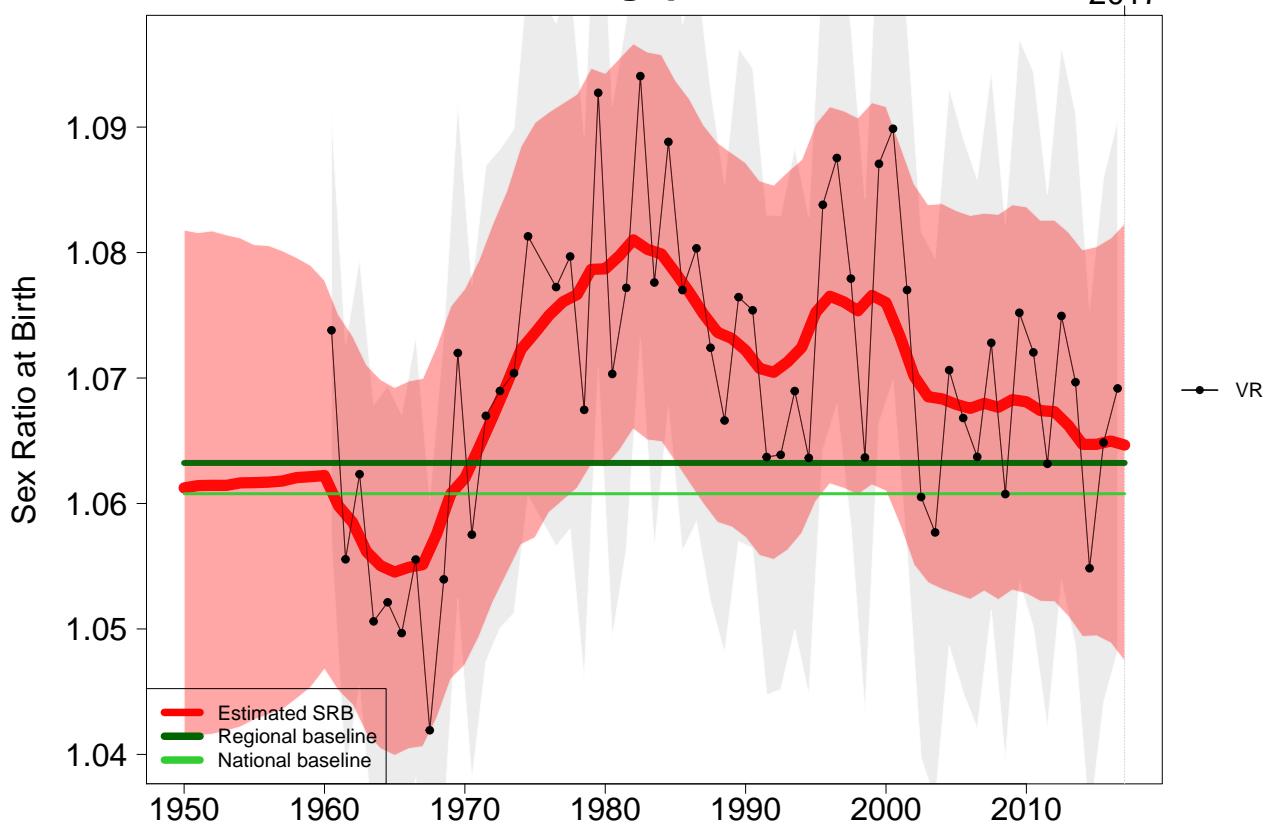
Sierra Leone

2017



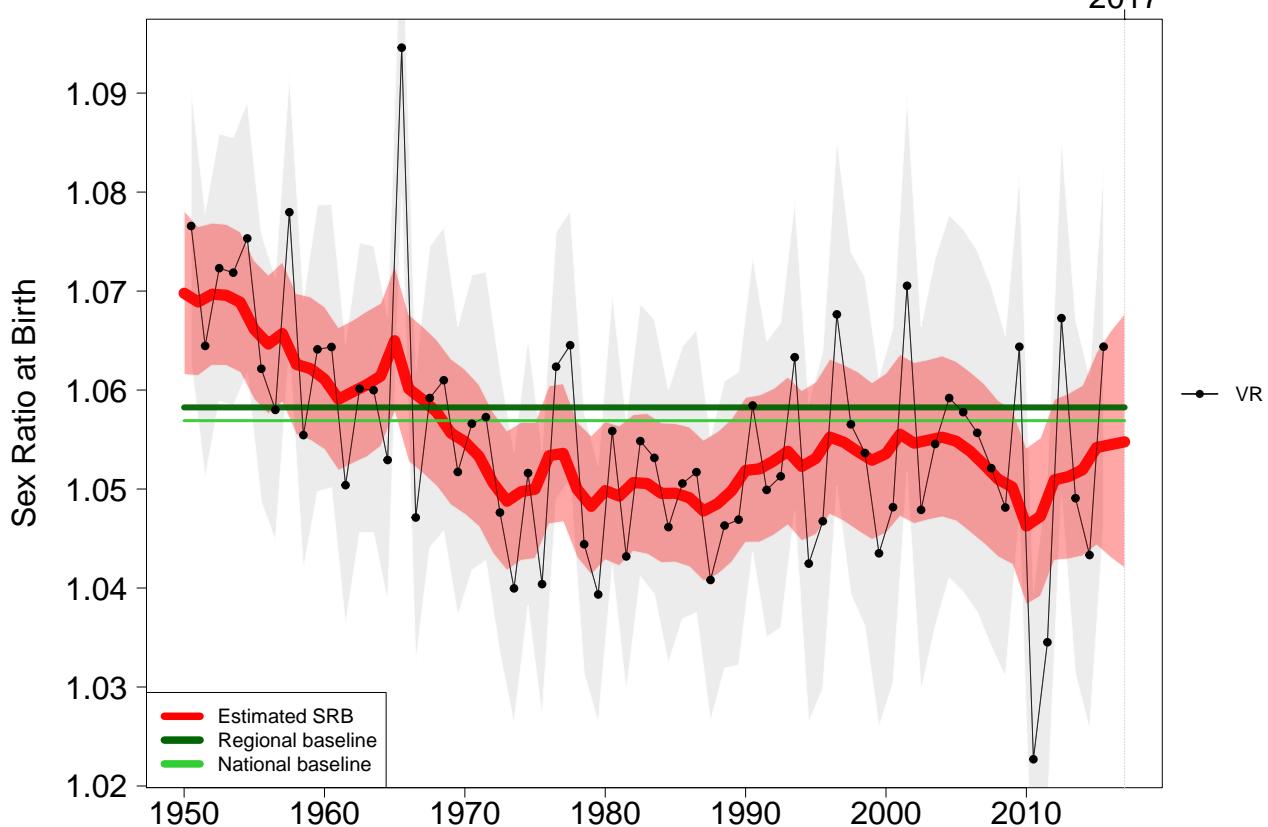
Singapore

2017



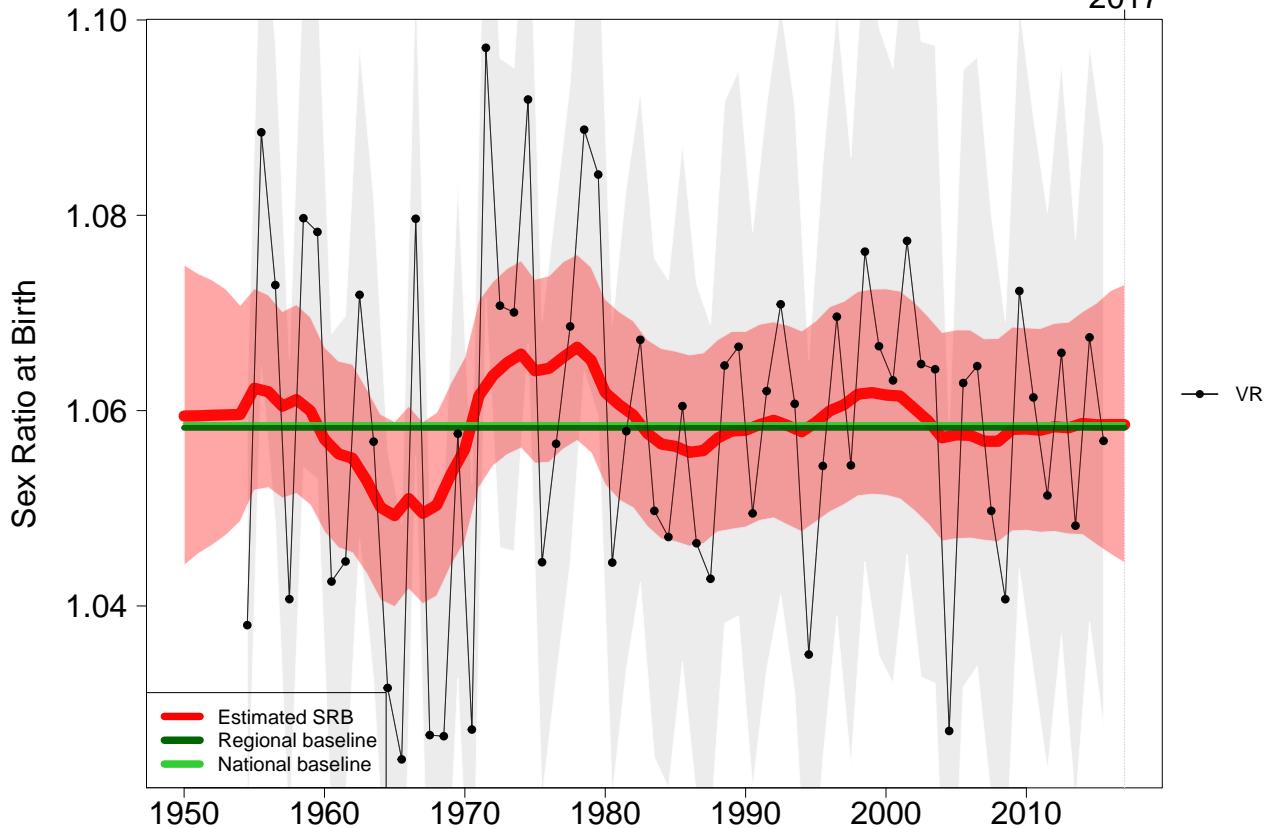
Slovakia

2017



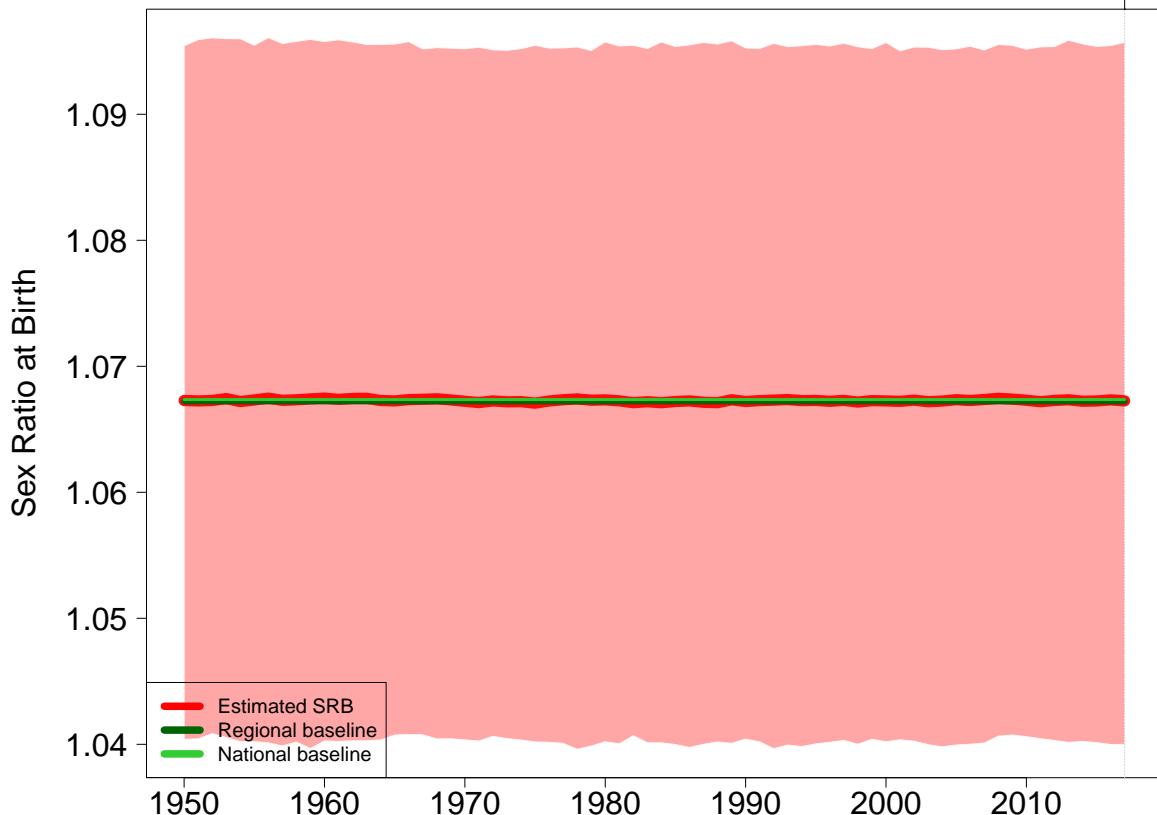
Slovenia

2017



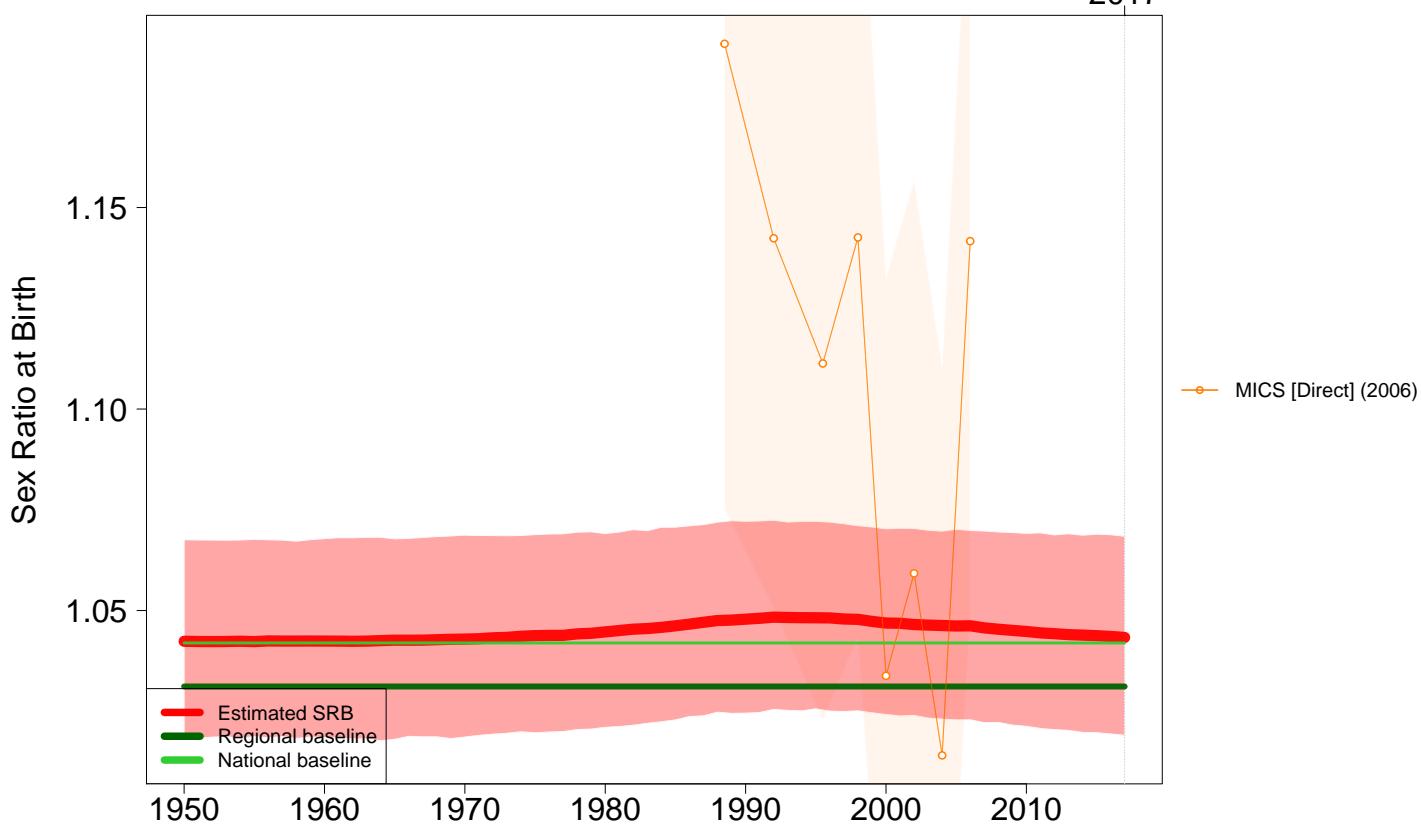
Solomon Islands

2017



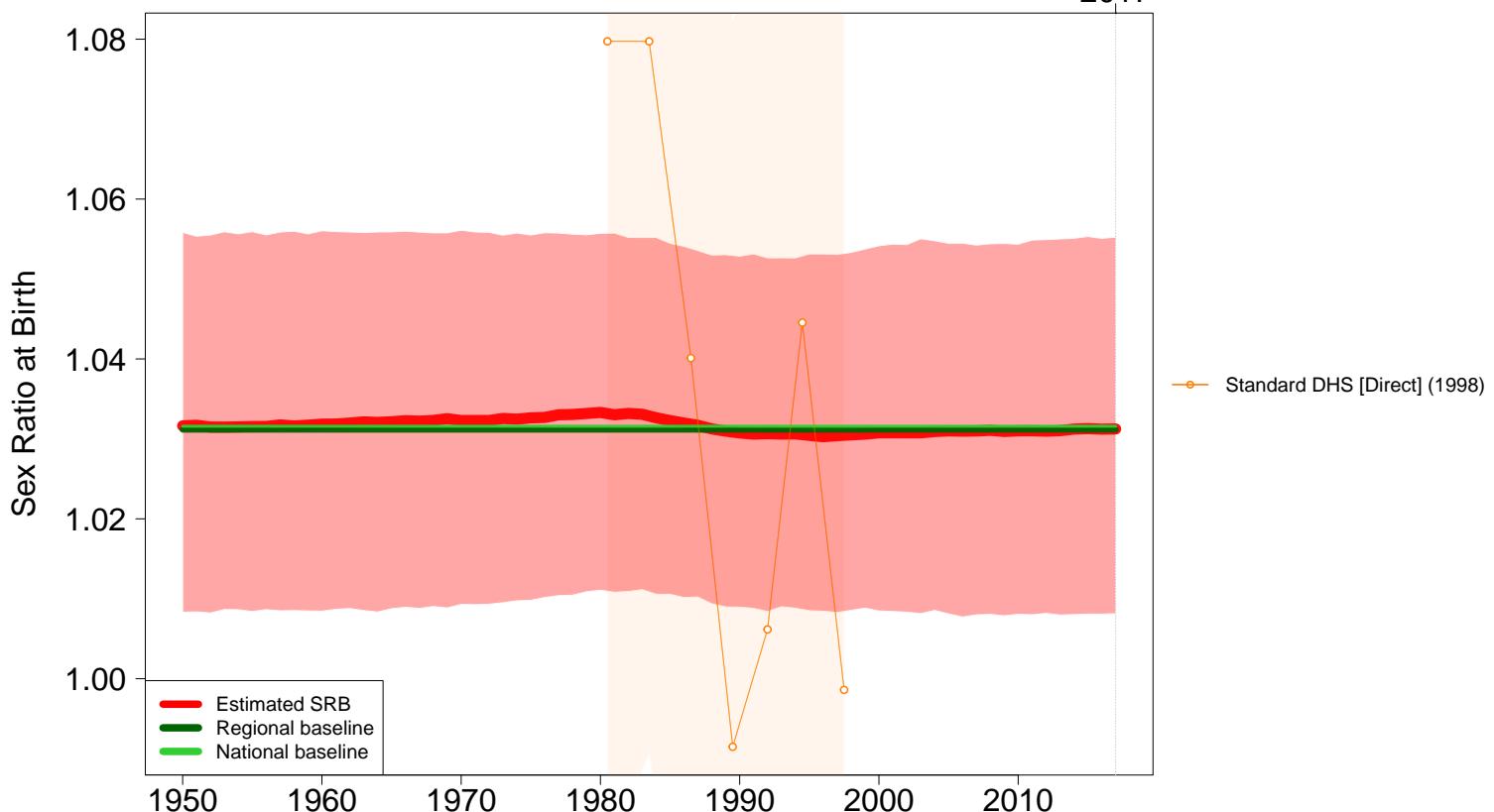
Somalia

2017



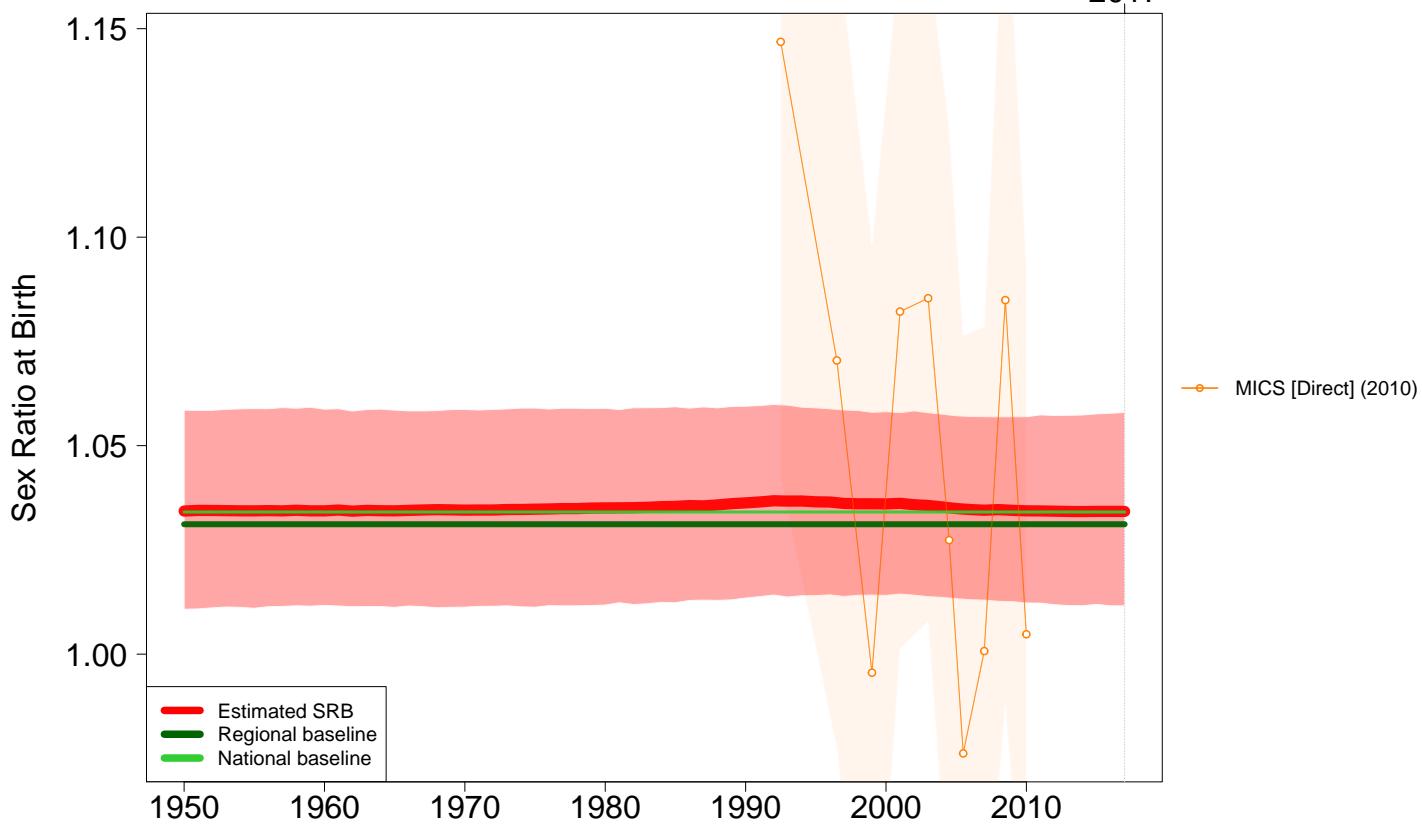
South Africa

2017



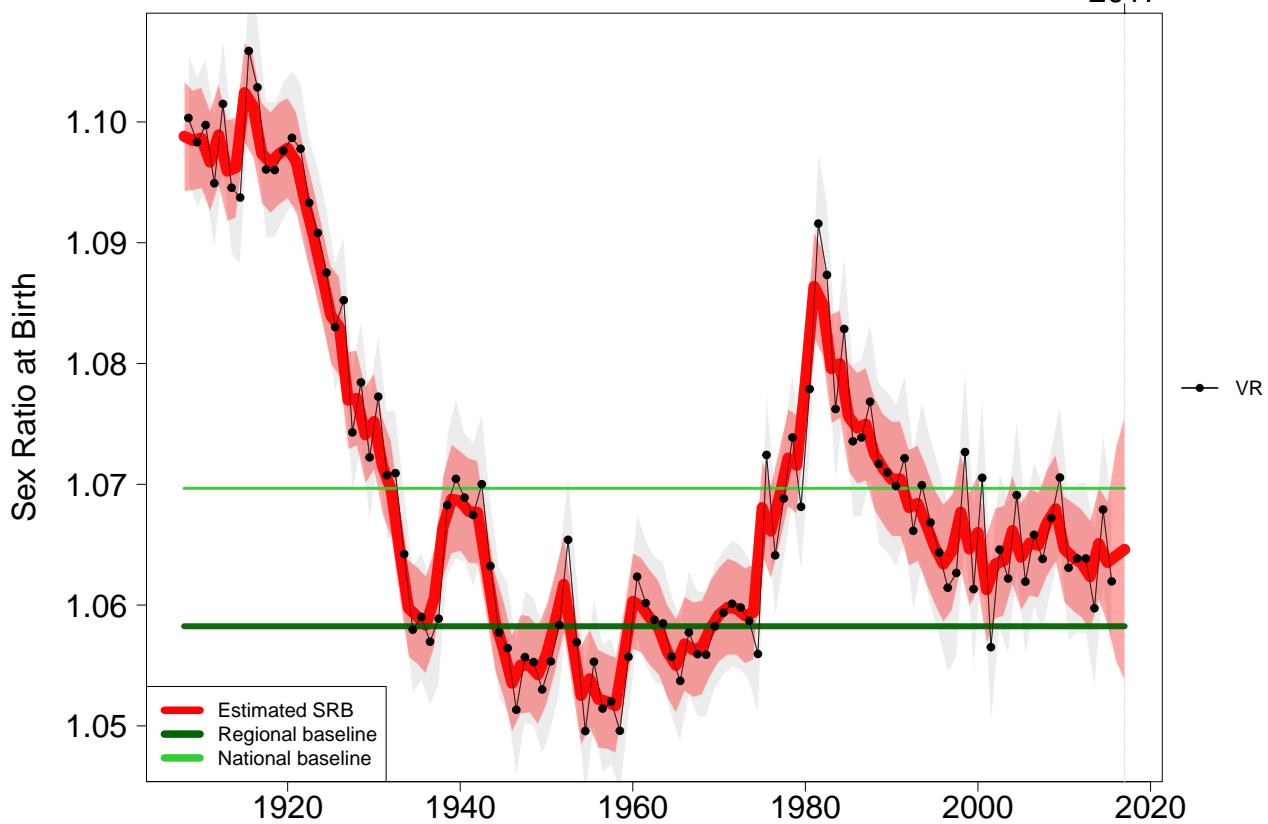
South Sudan

2017



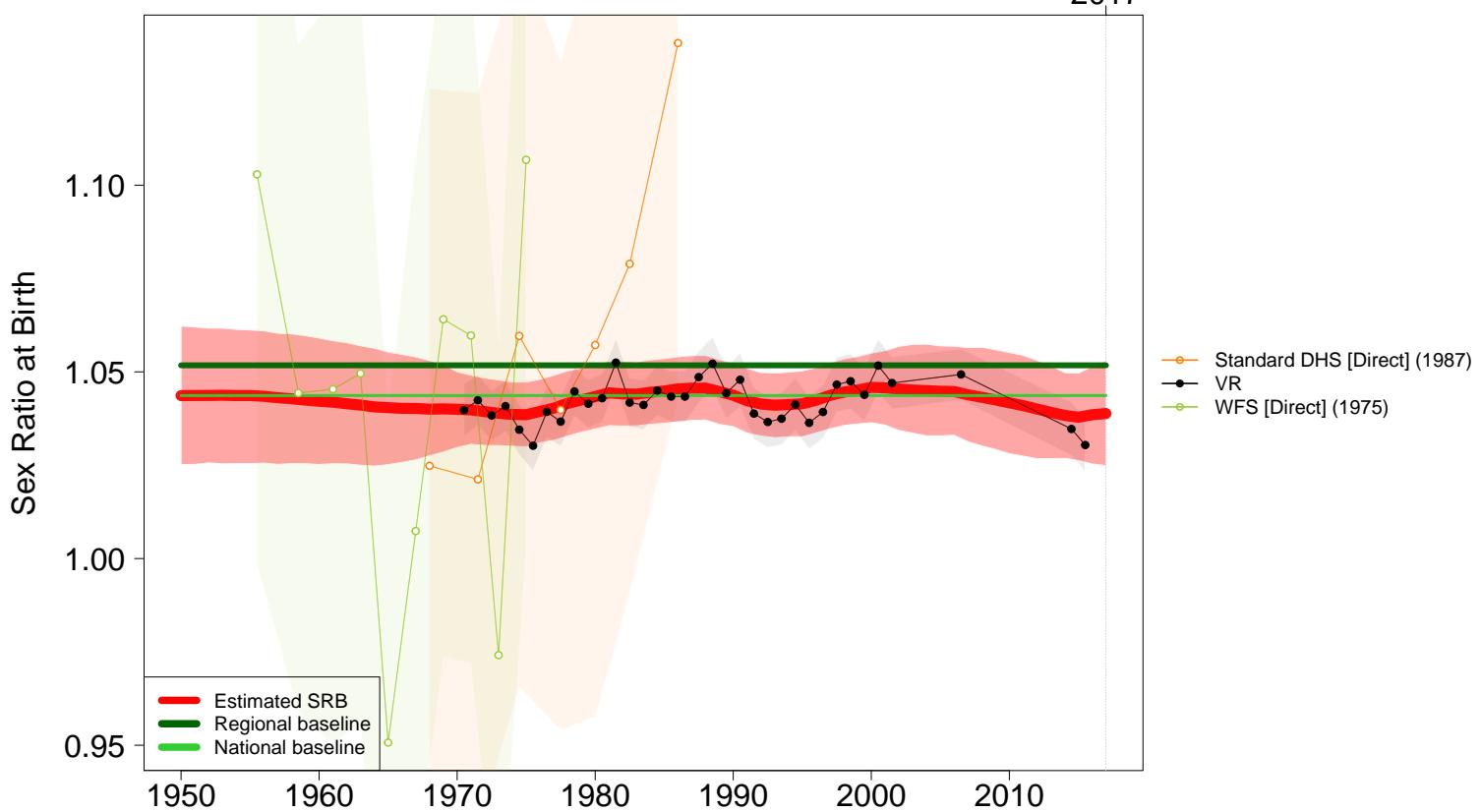
Spain

2017



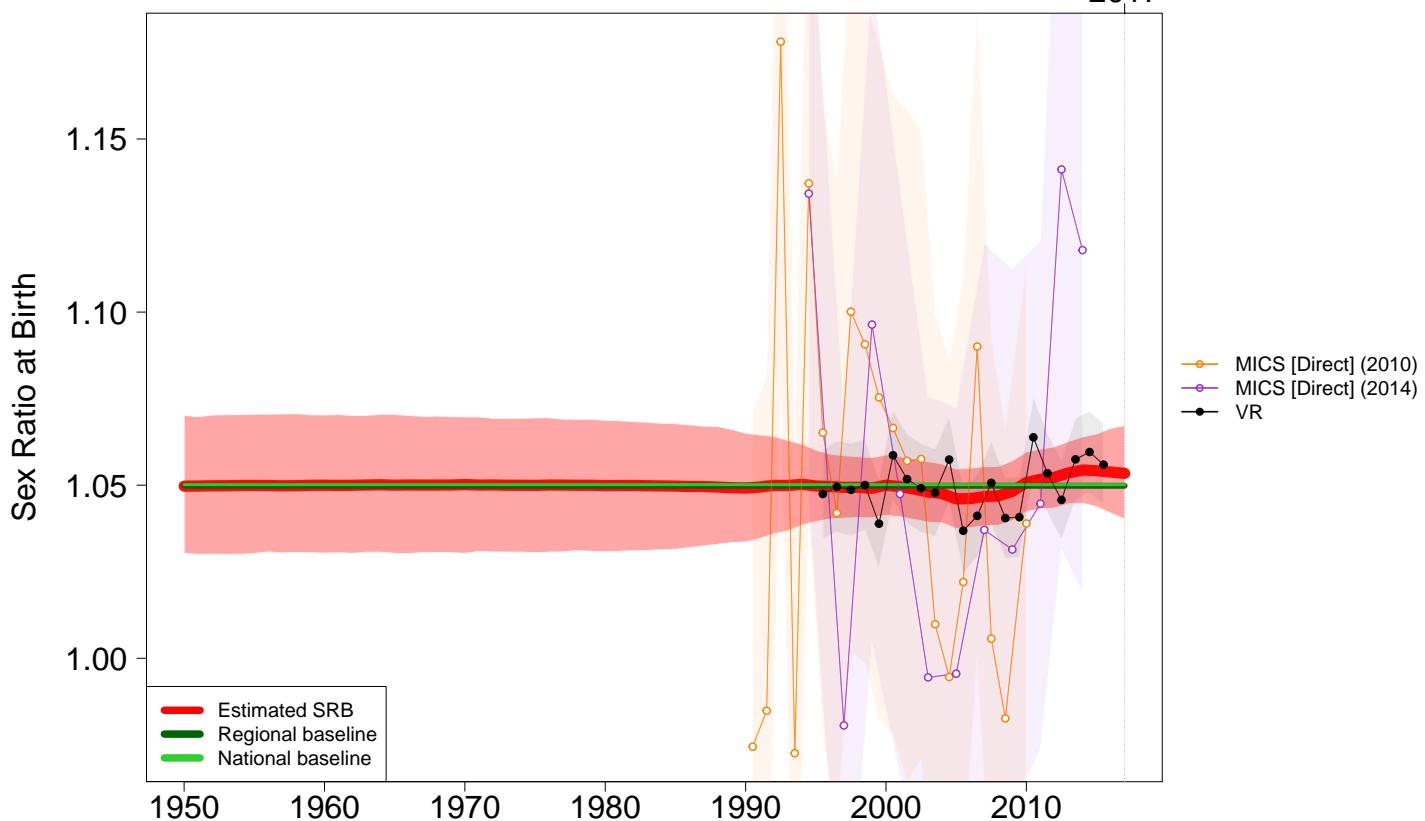
Sri Lanka

2017



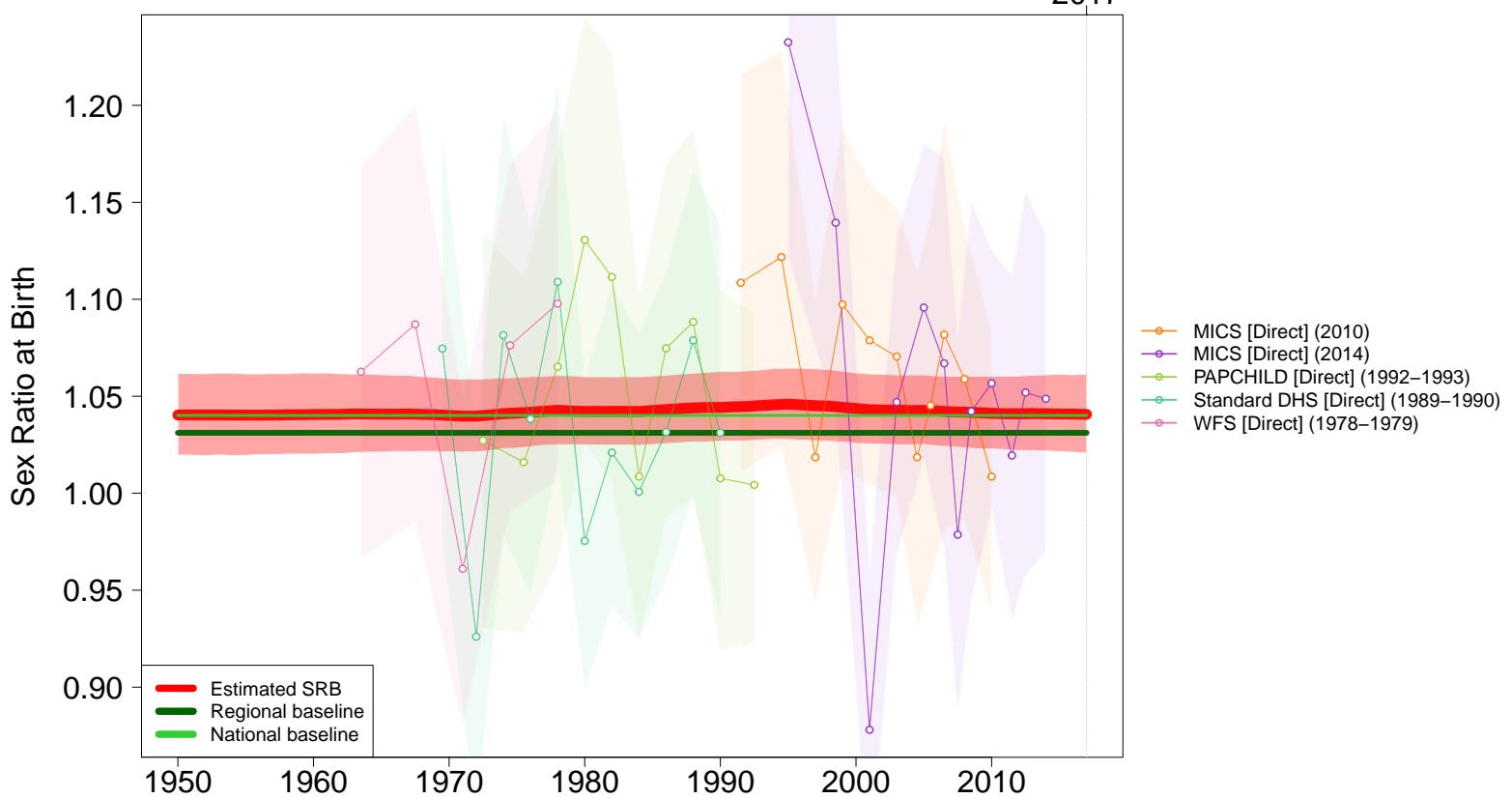
State of Palestine

2017



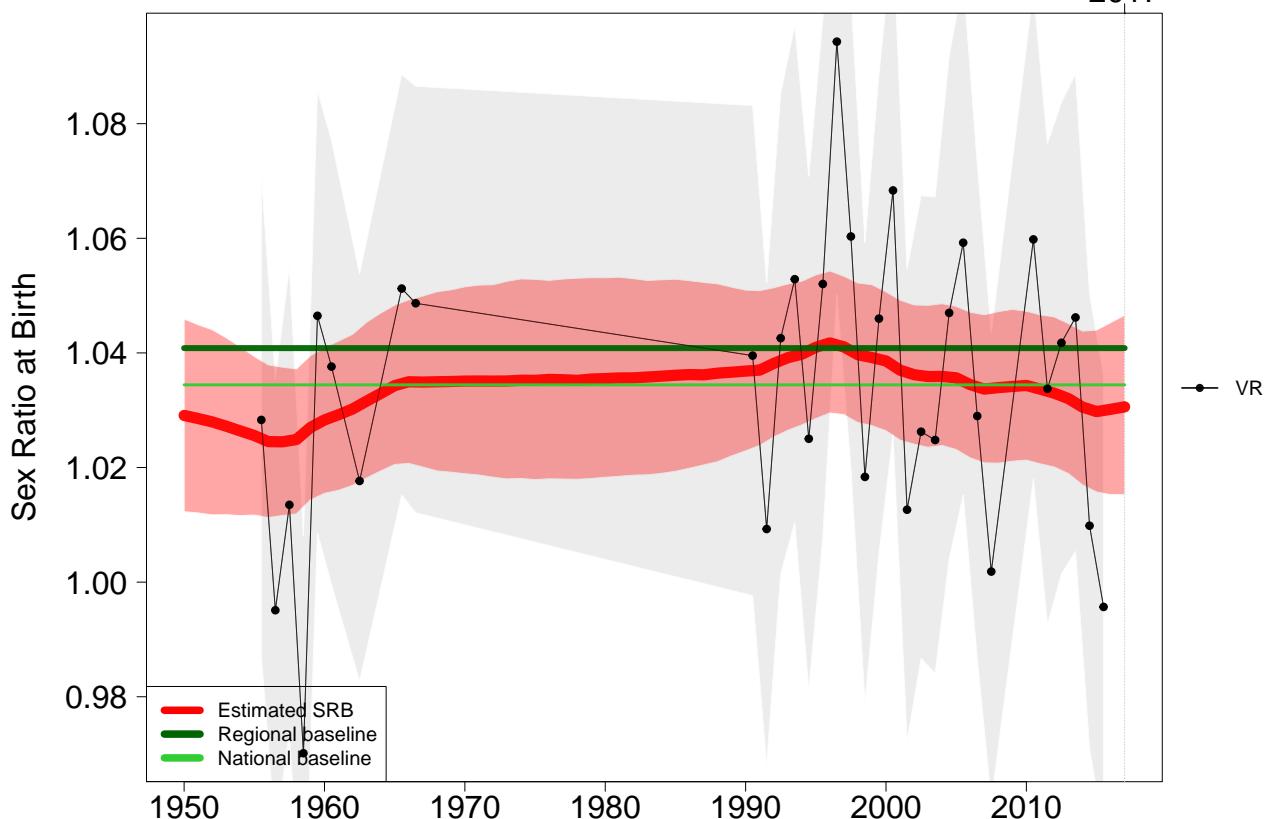
Sudan

2017

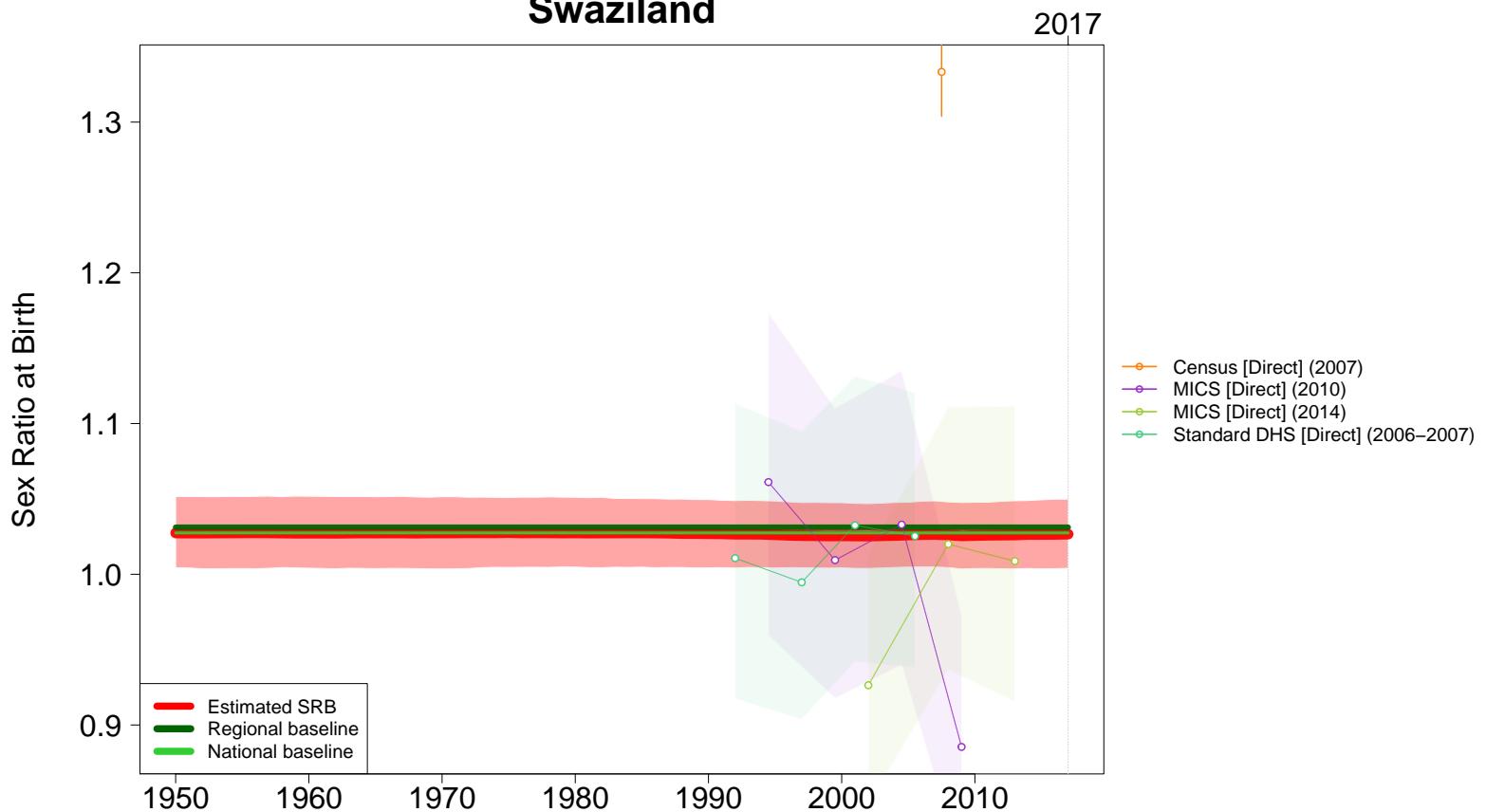


Suriname

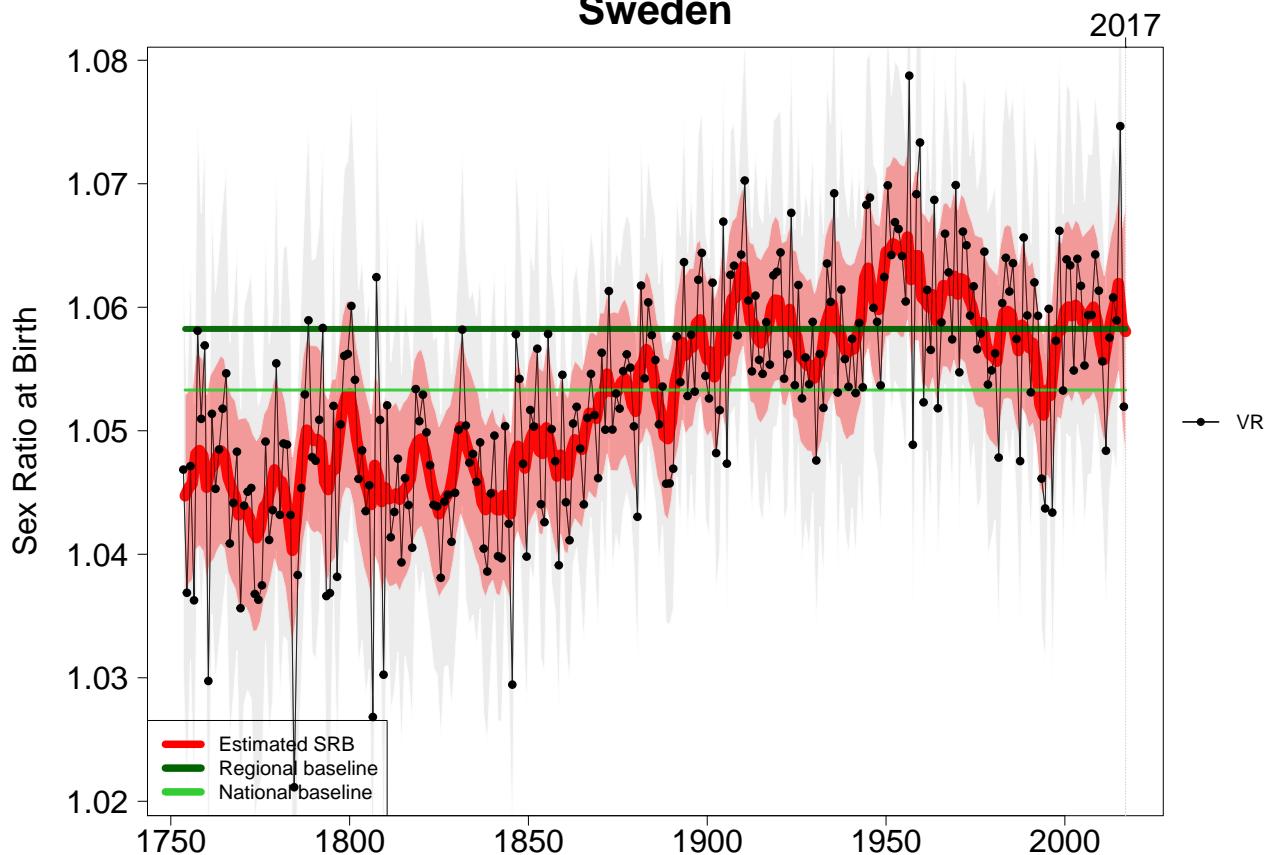
2017



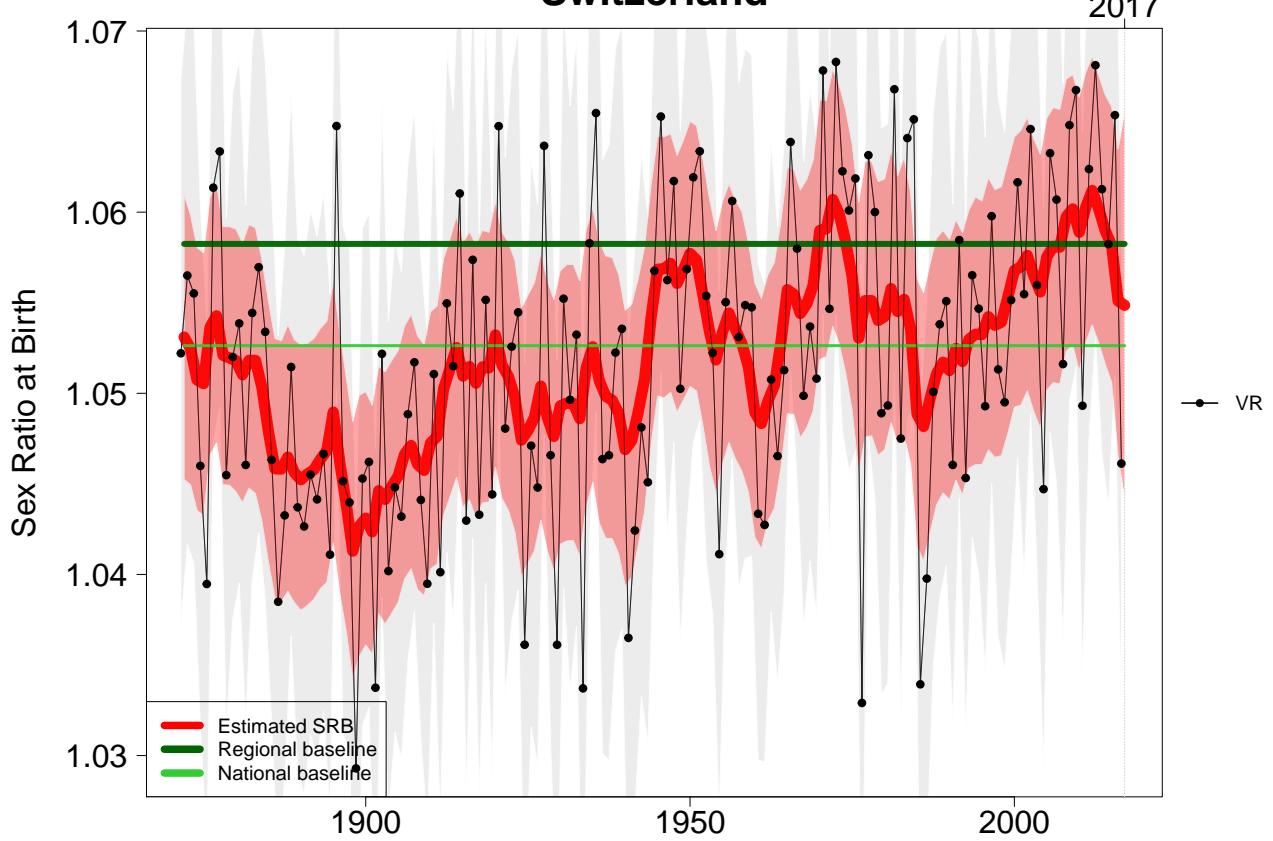
Swaziland



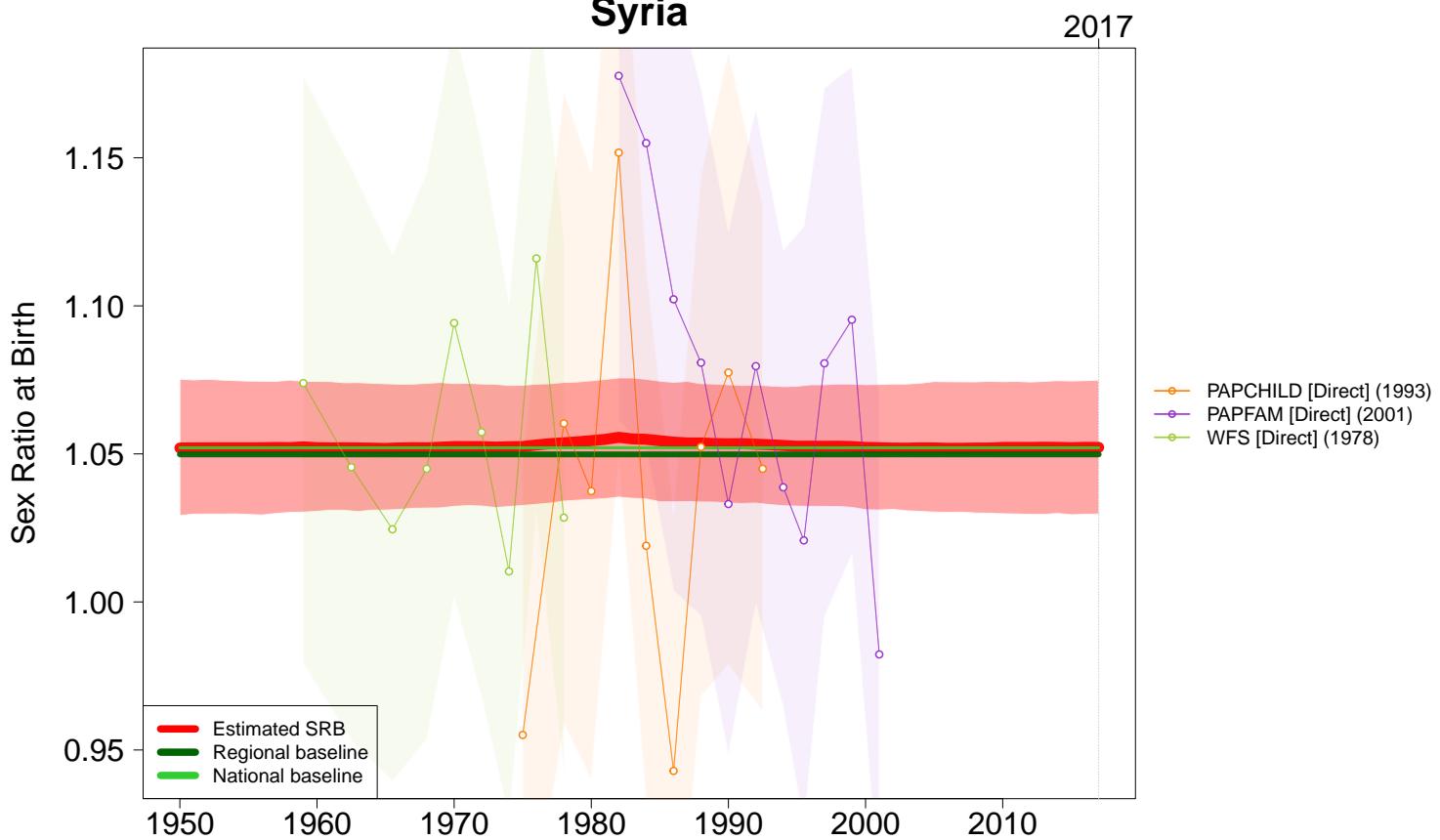
Sweden



Switzerland

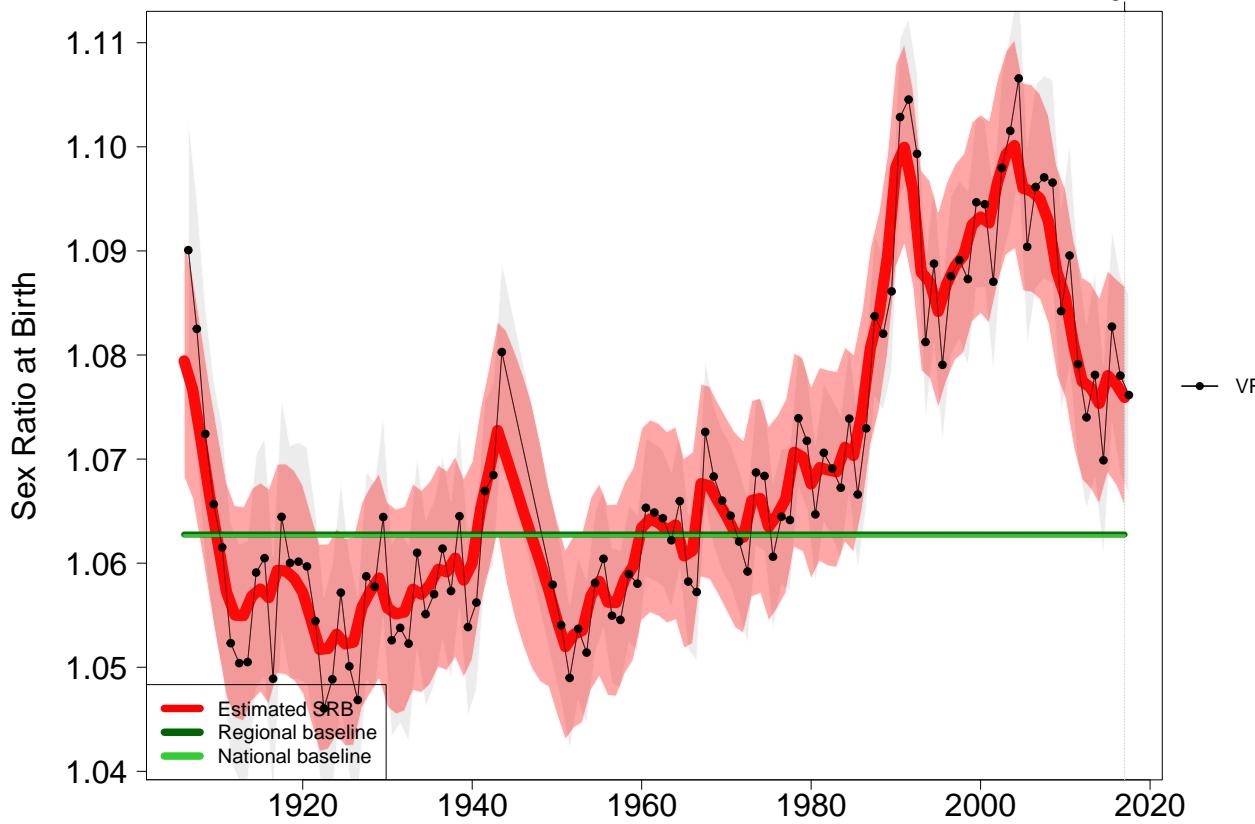


Syria



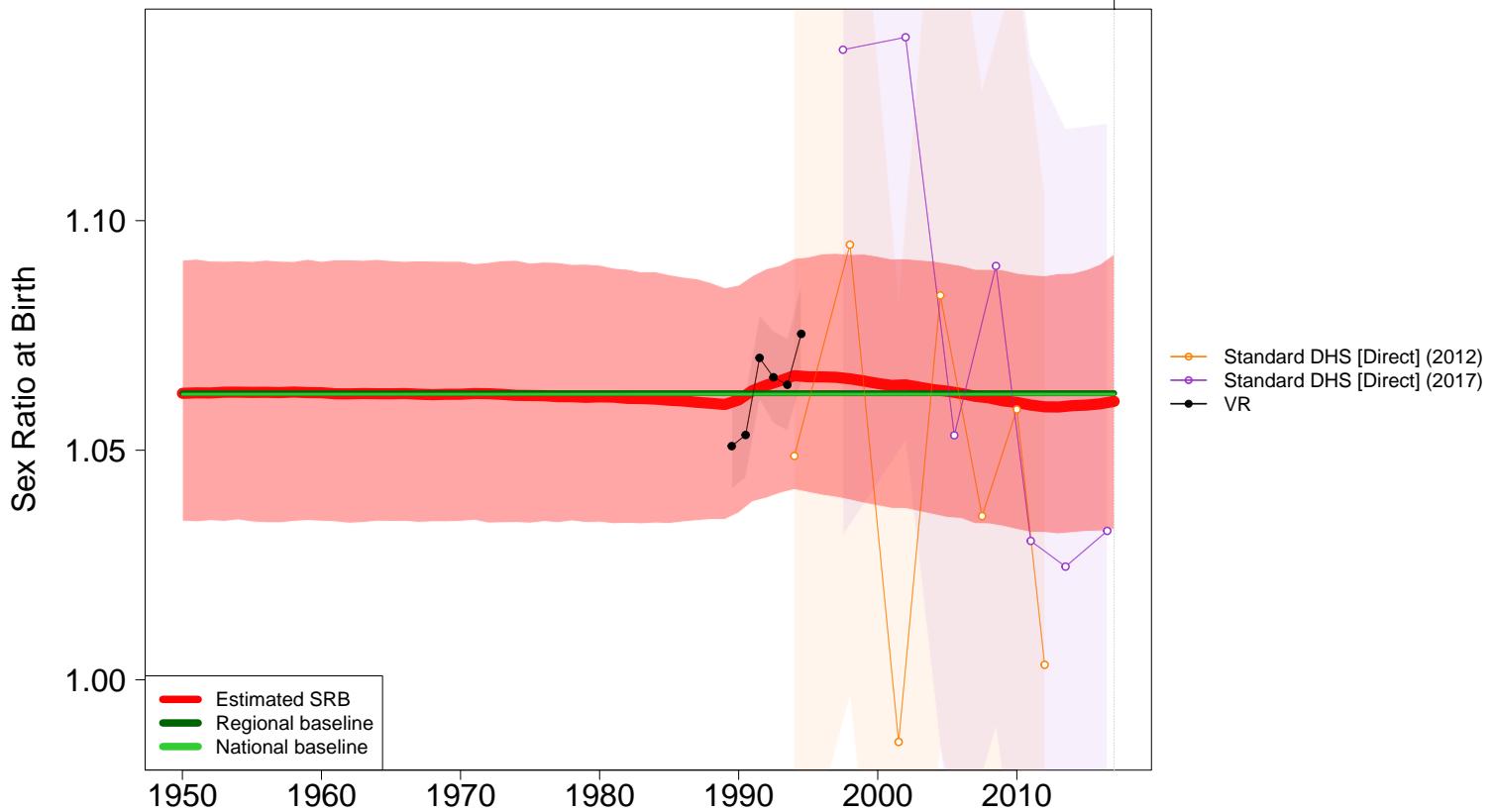
Taiwan, Province of China

2017



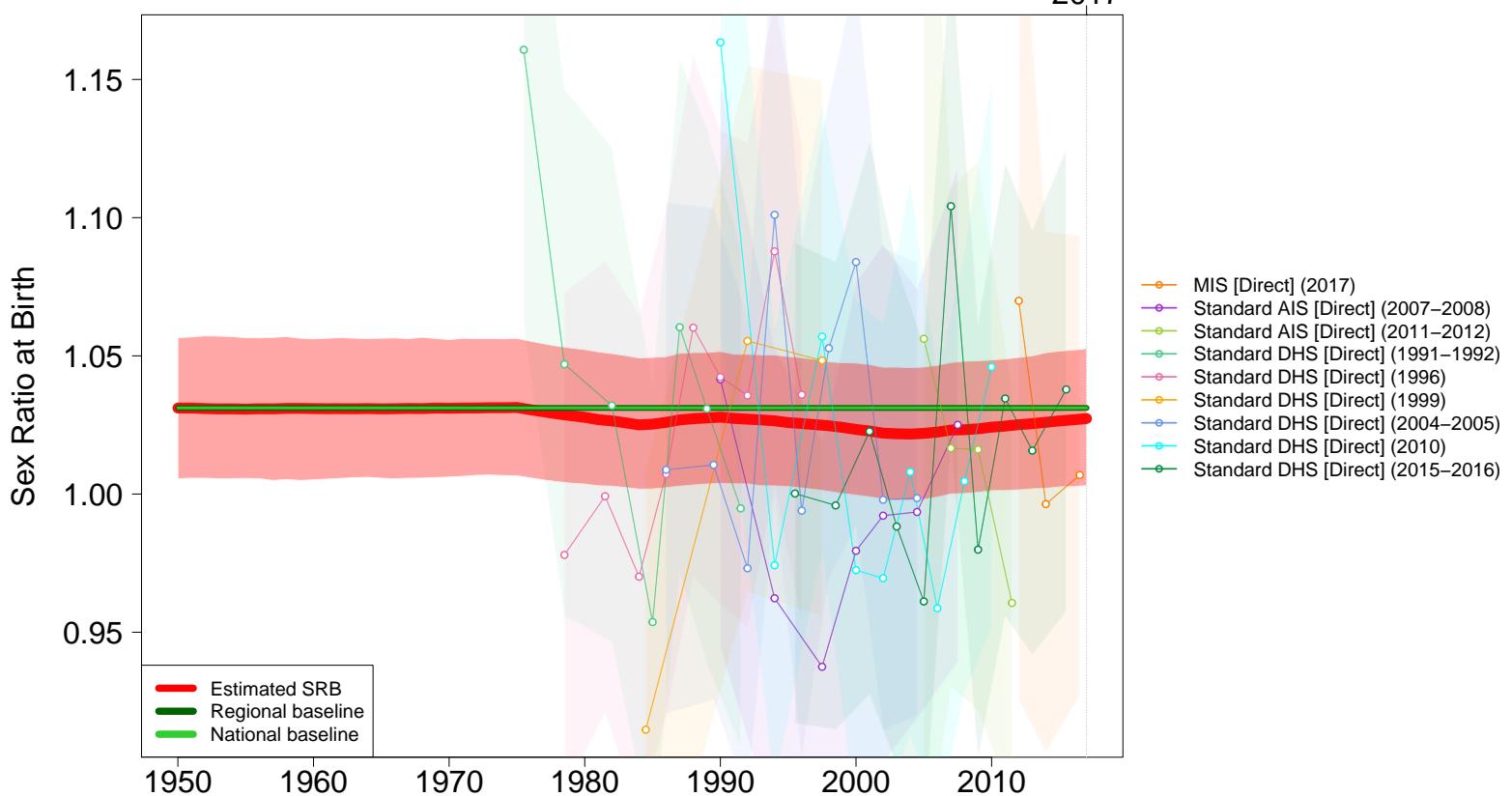
Tajikistan

2017



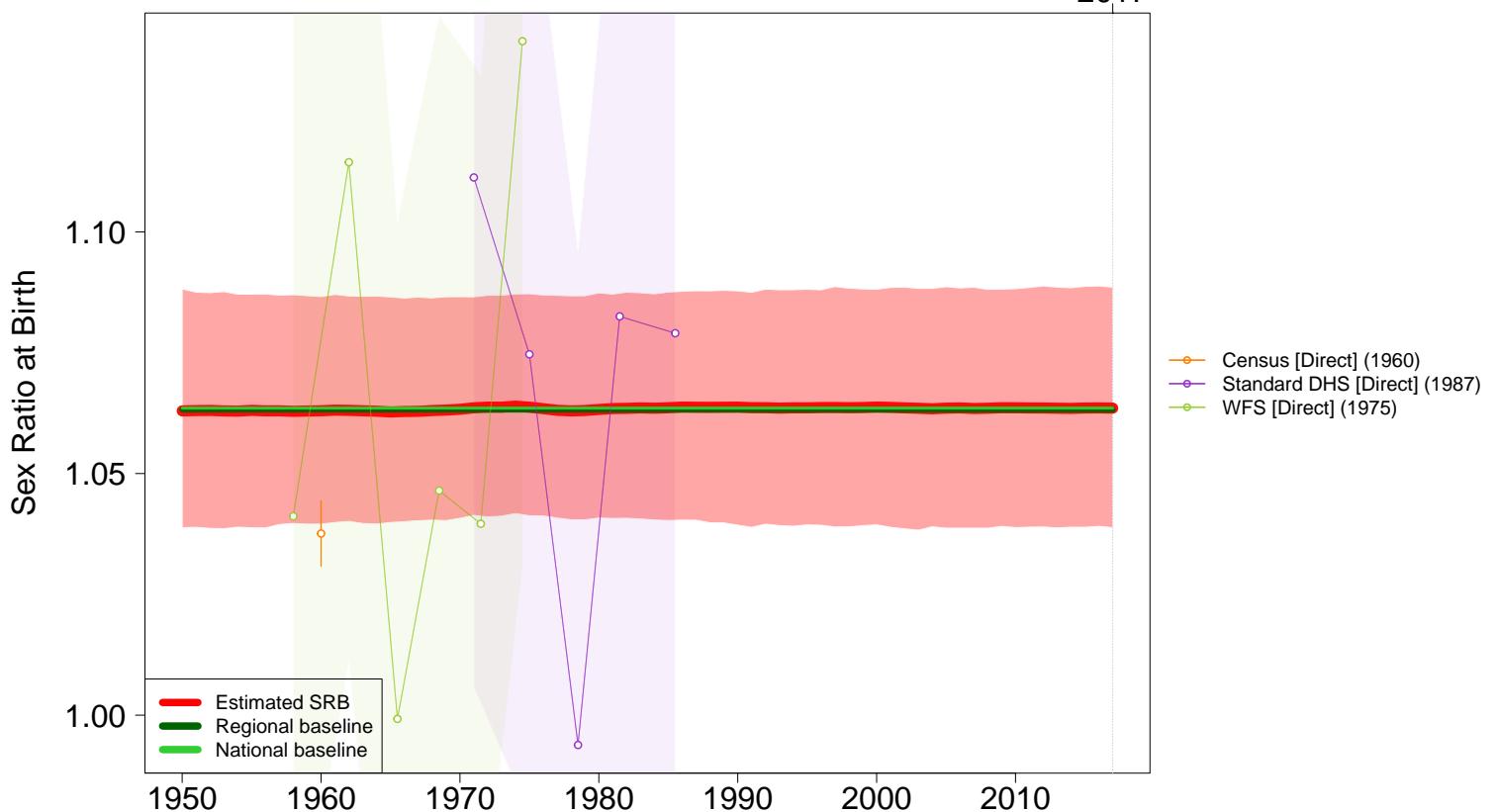
Tanzania

2017



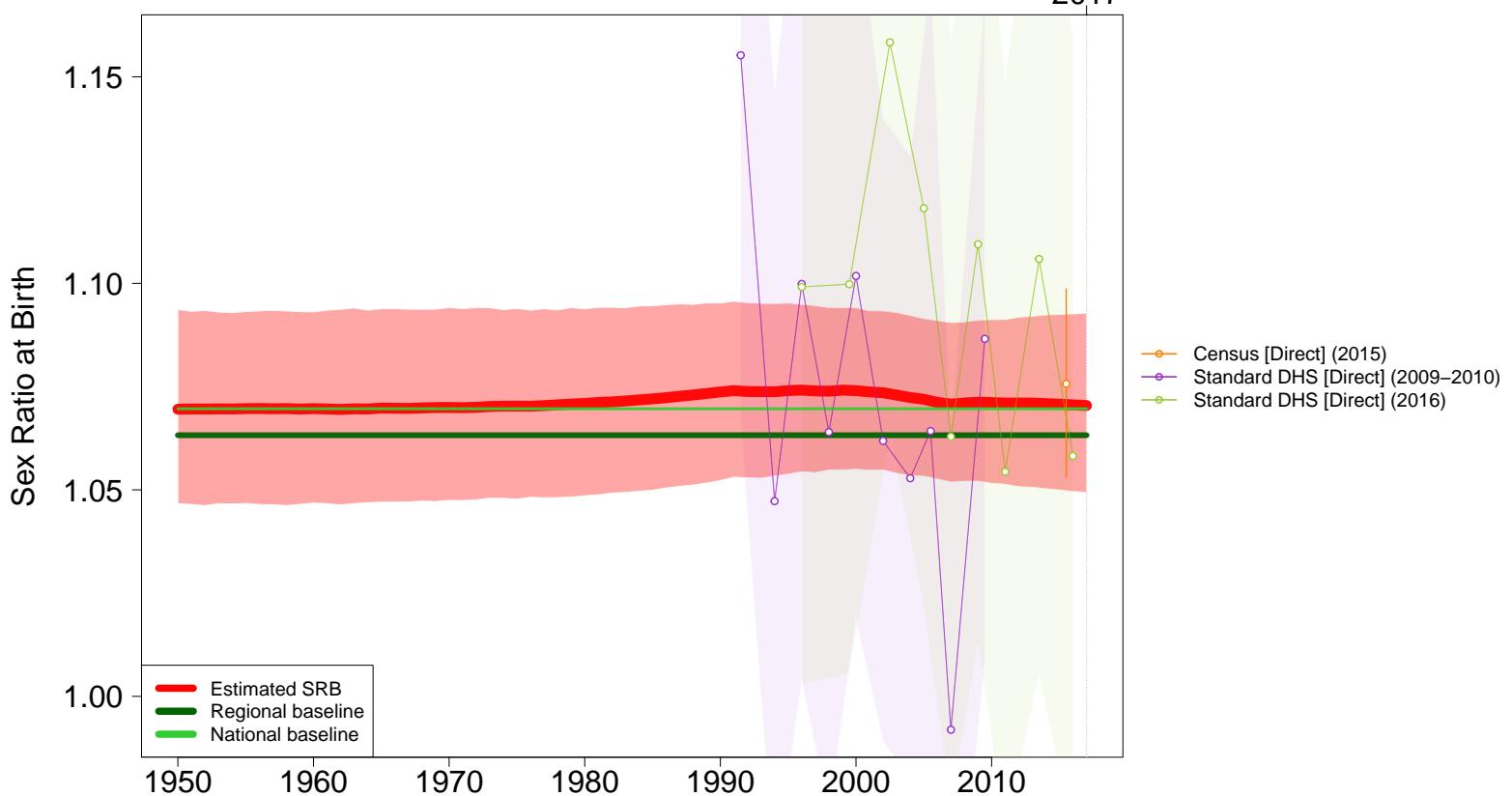
Thailand

2017



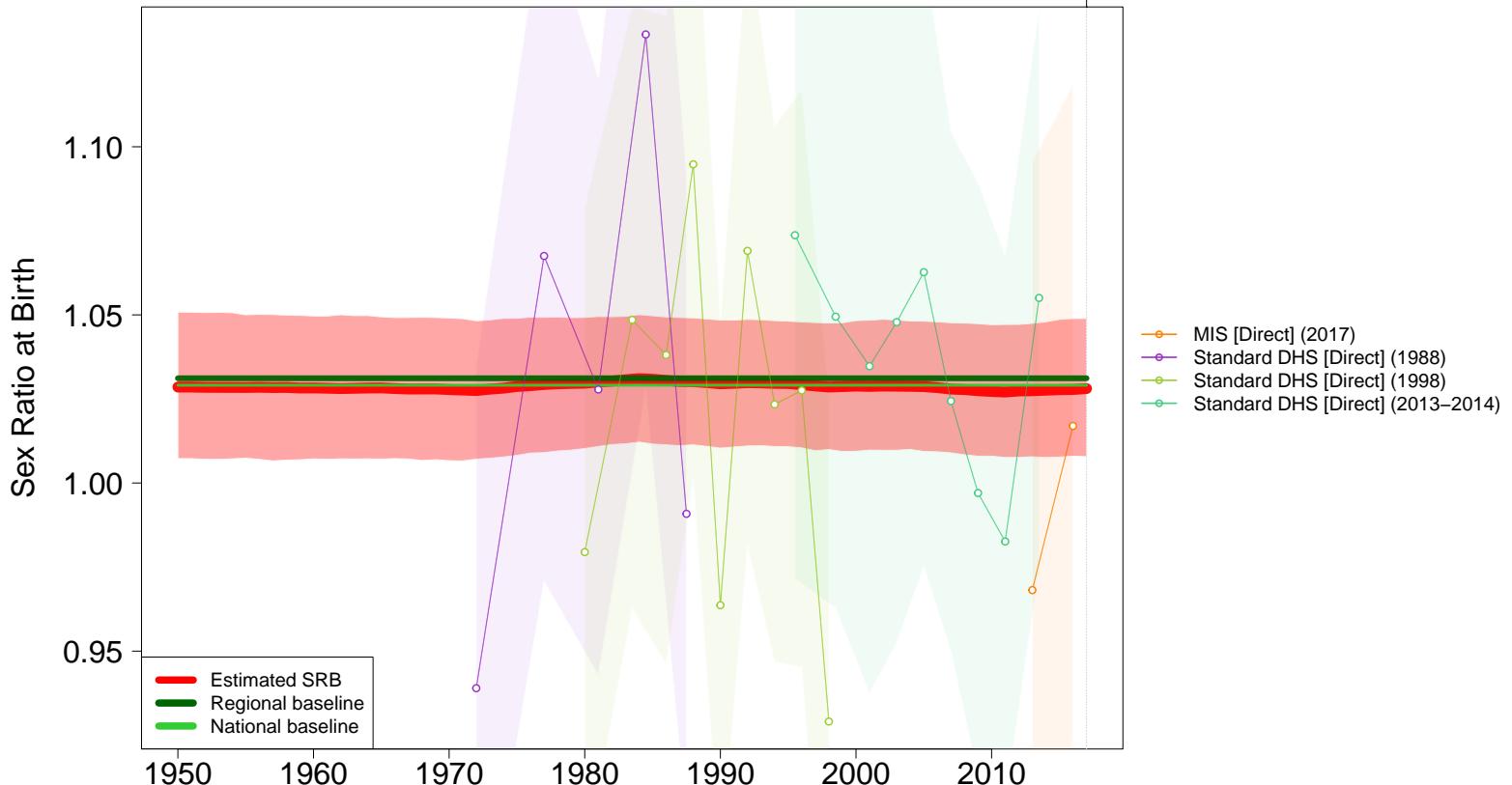
Timor-Leste

2017



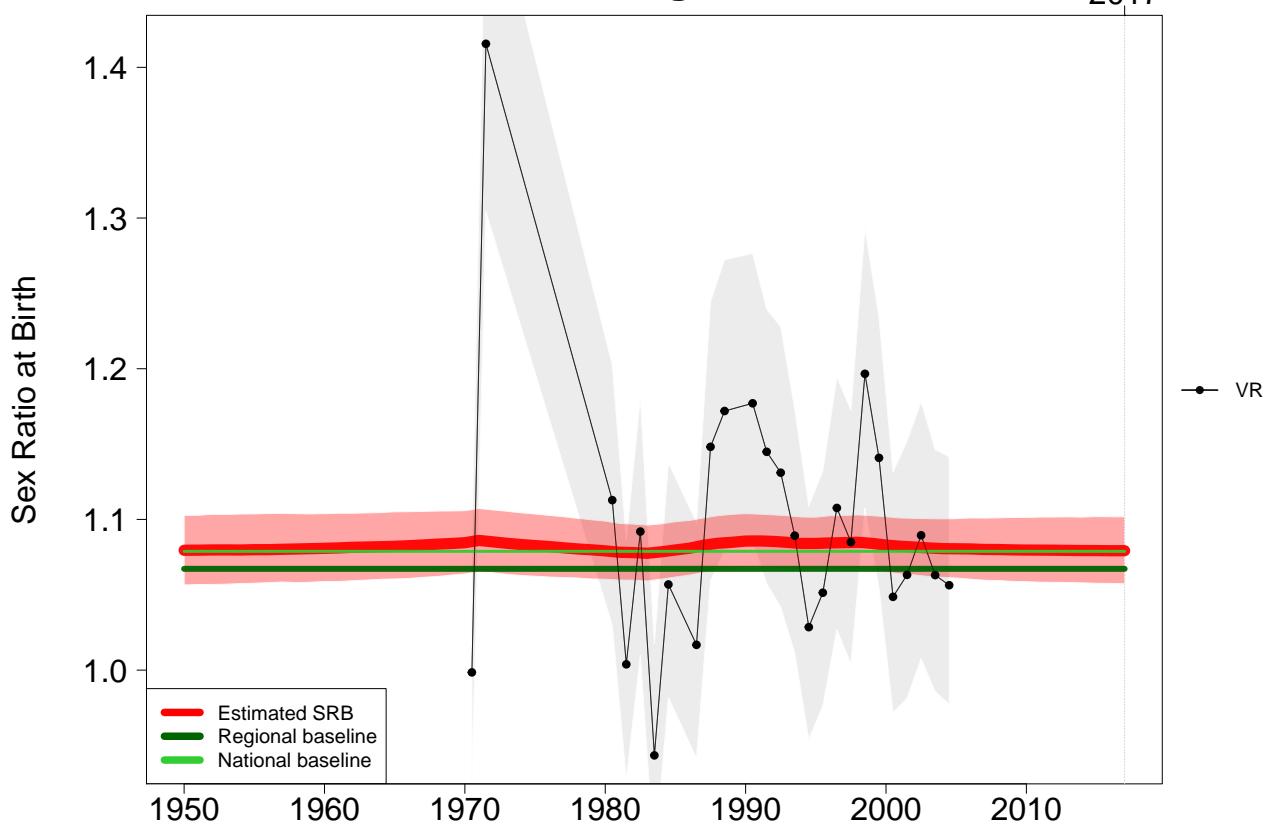
Togo

2017



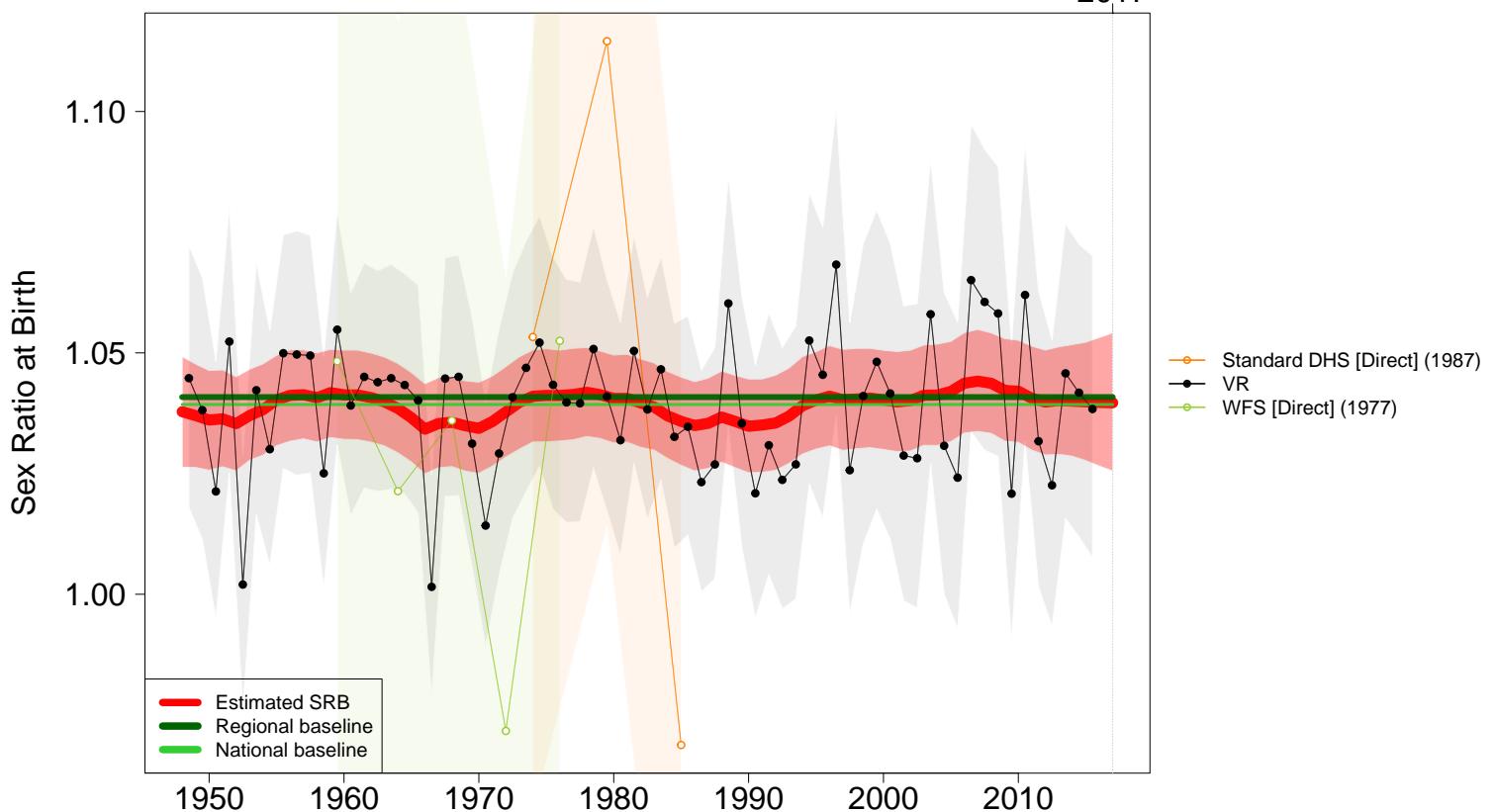
Tonga

2017



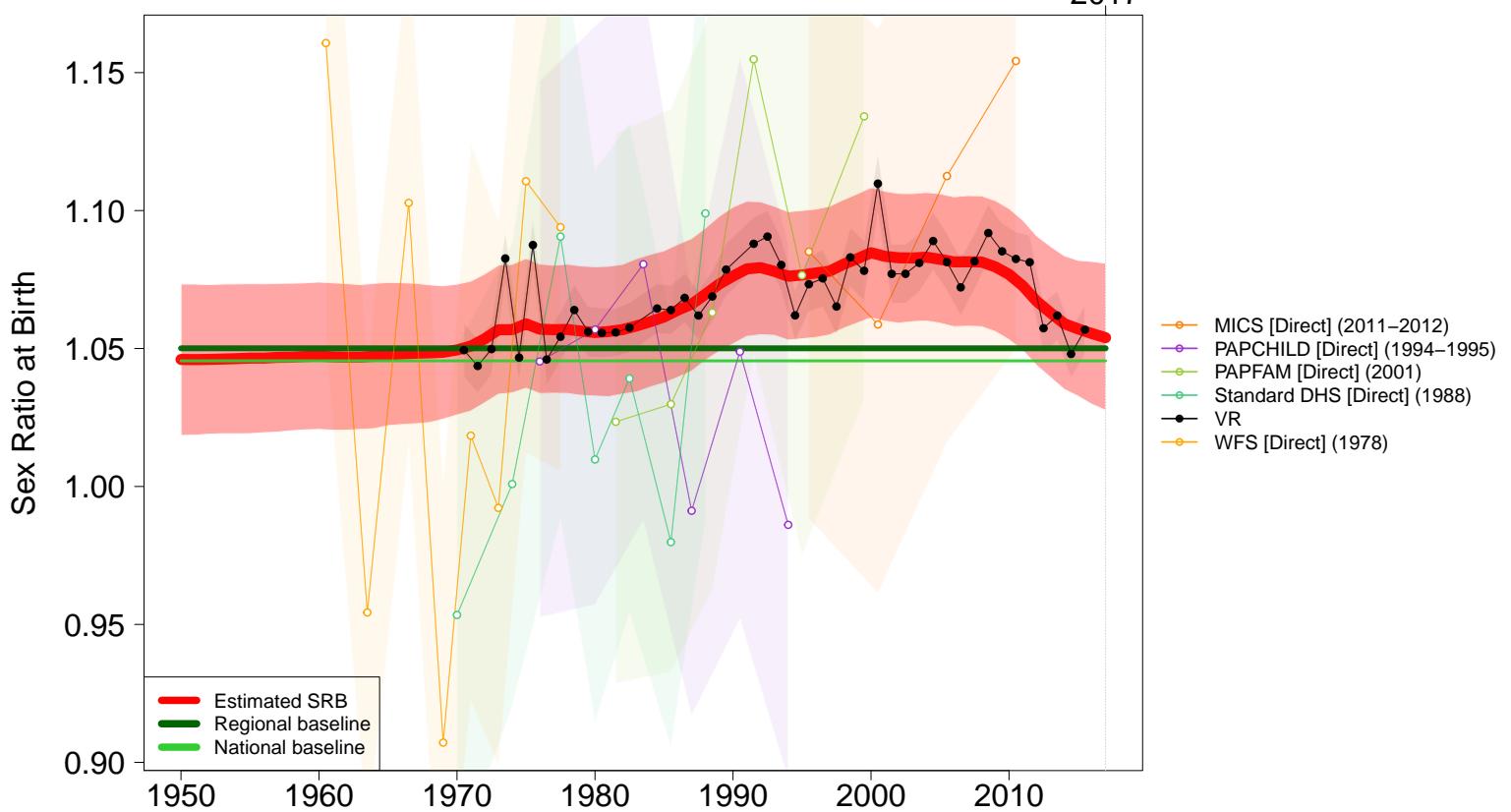
Trinidad and Tobago

2017



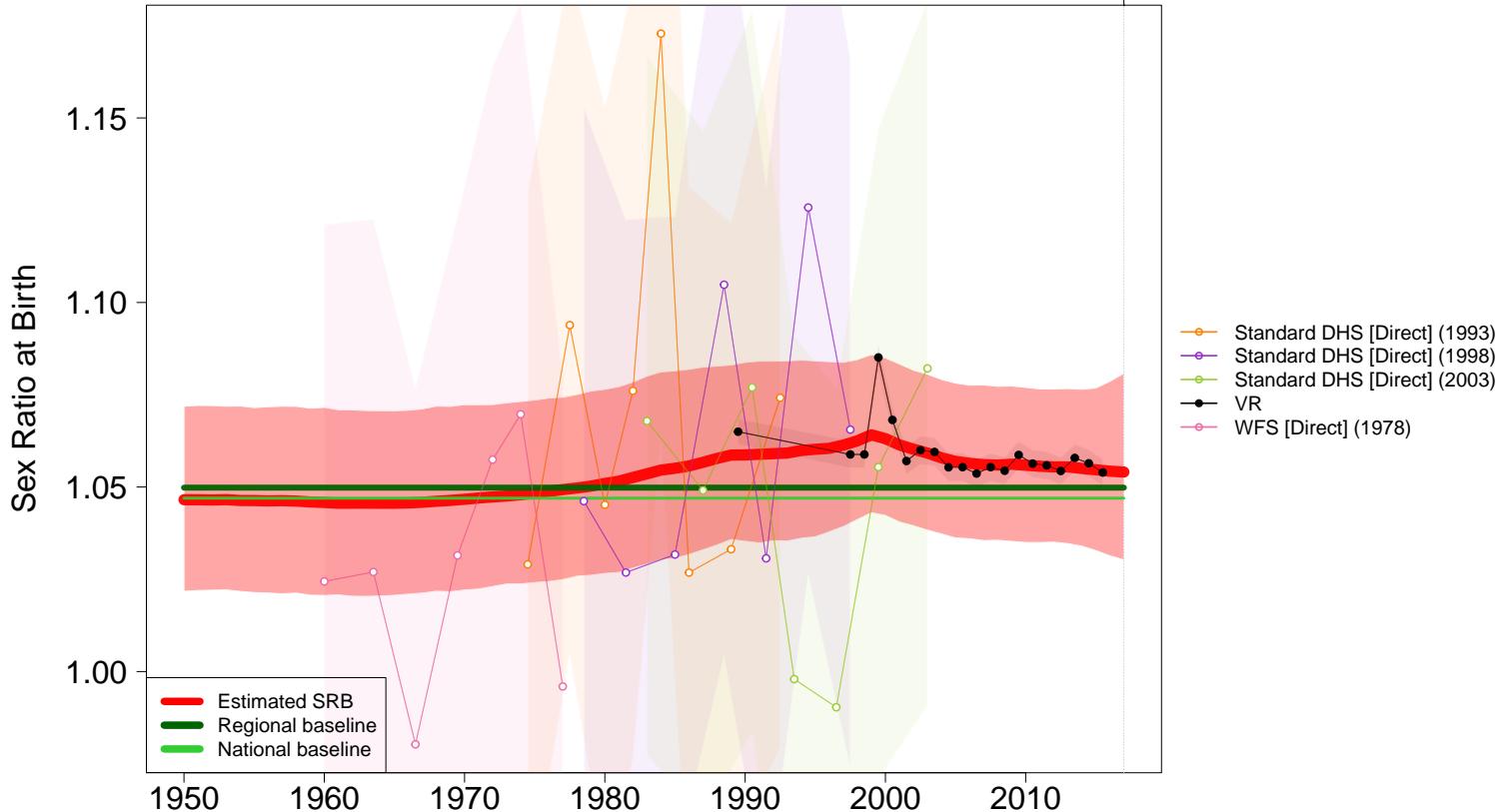
Tunisia

2017

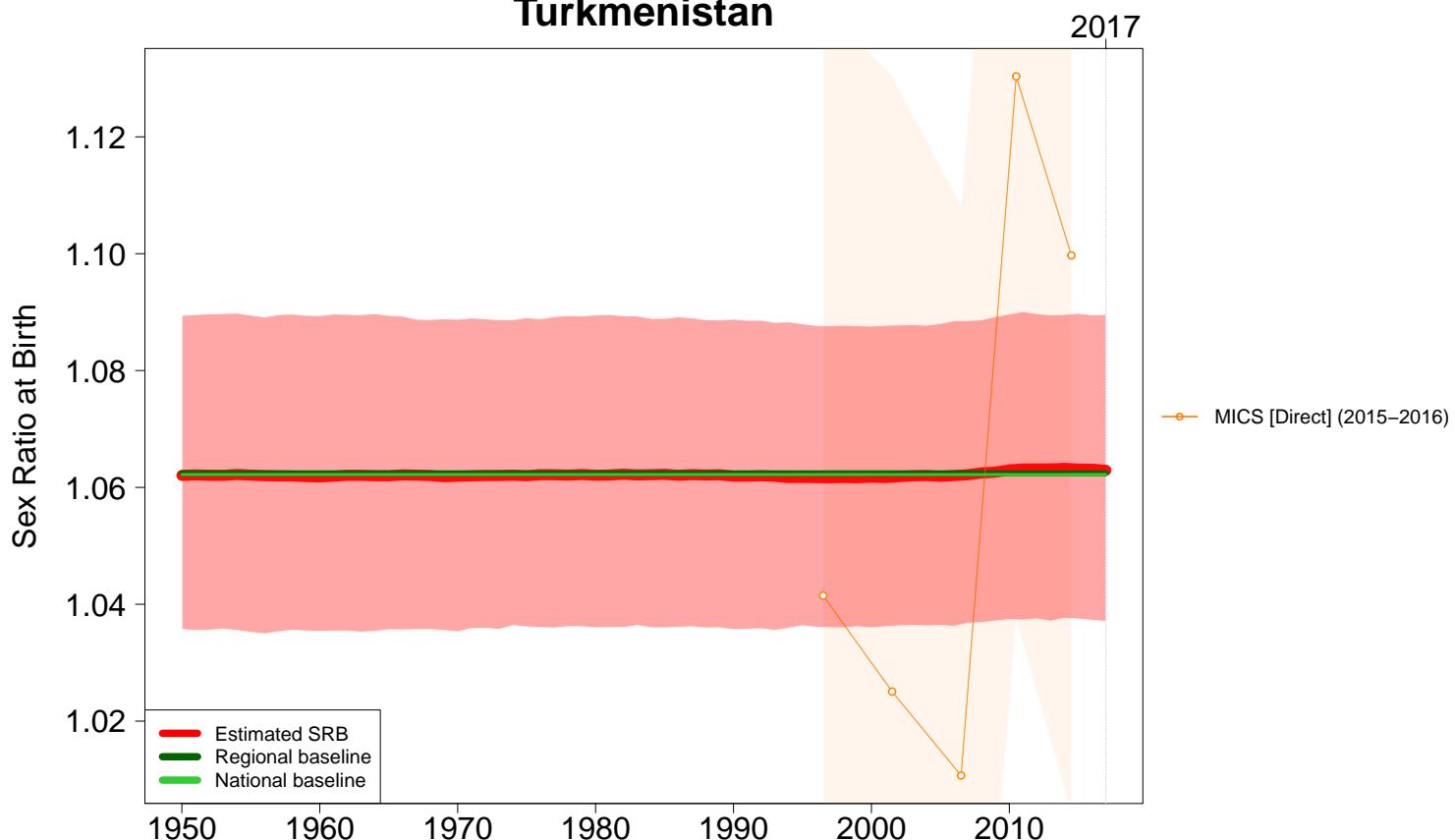


Turkey

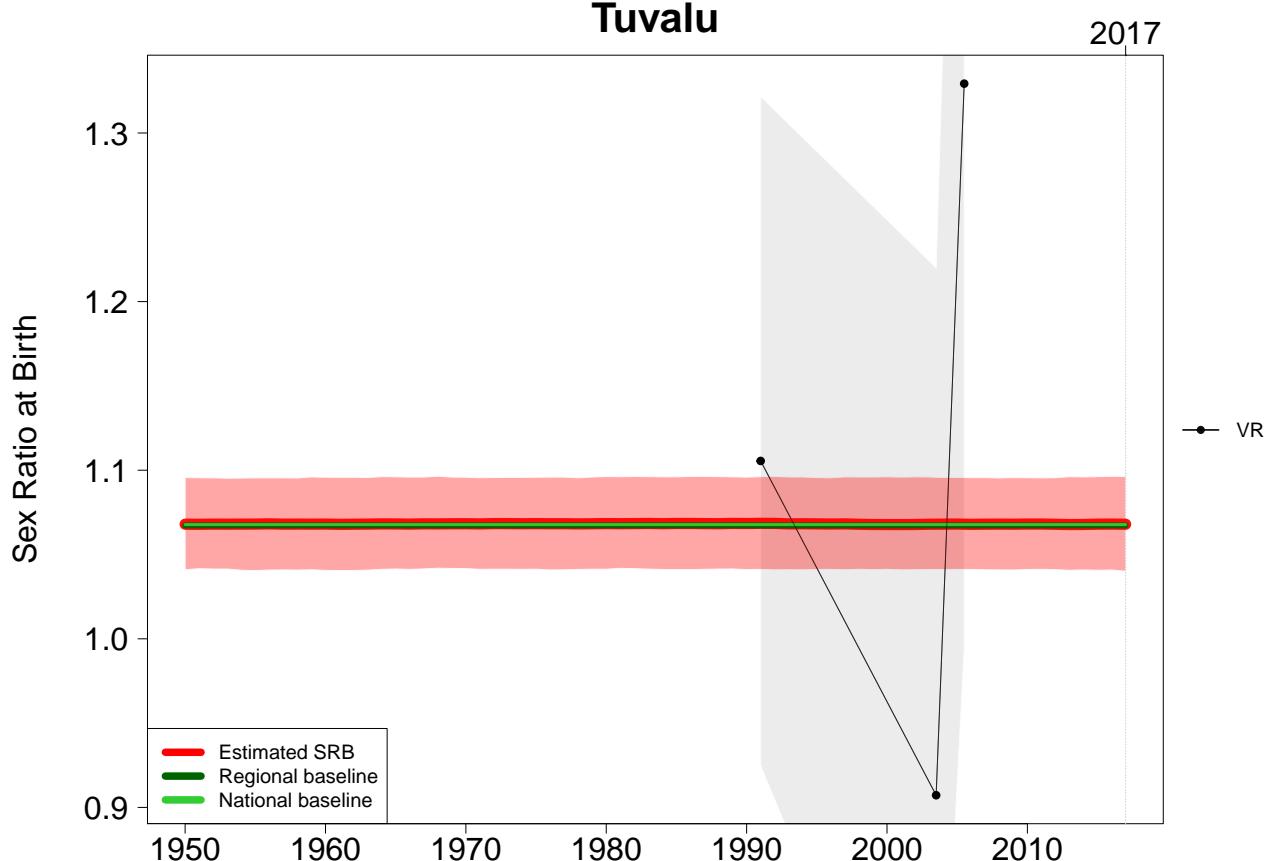
2017



Turkmenistan

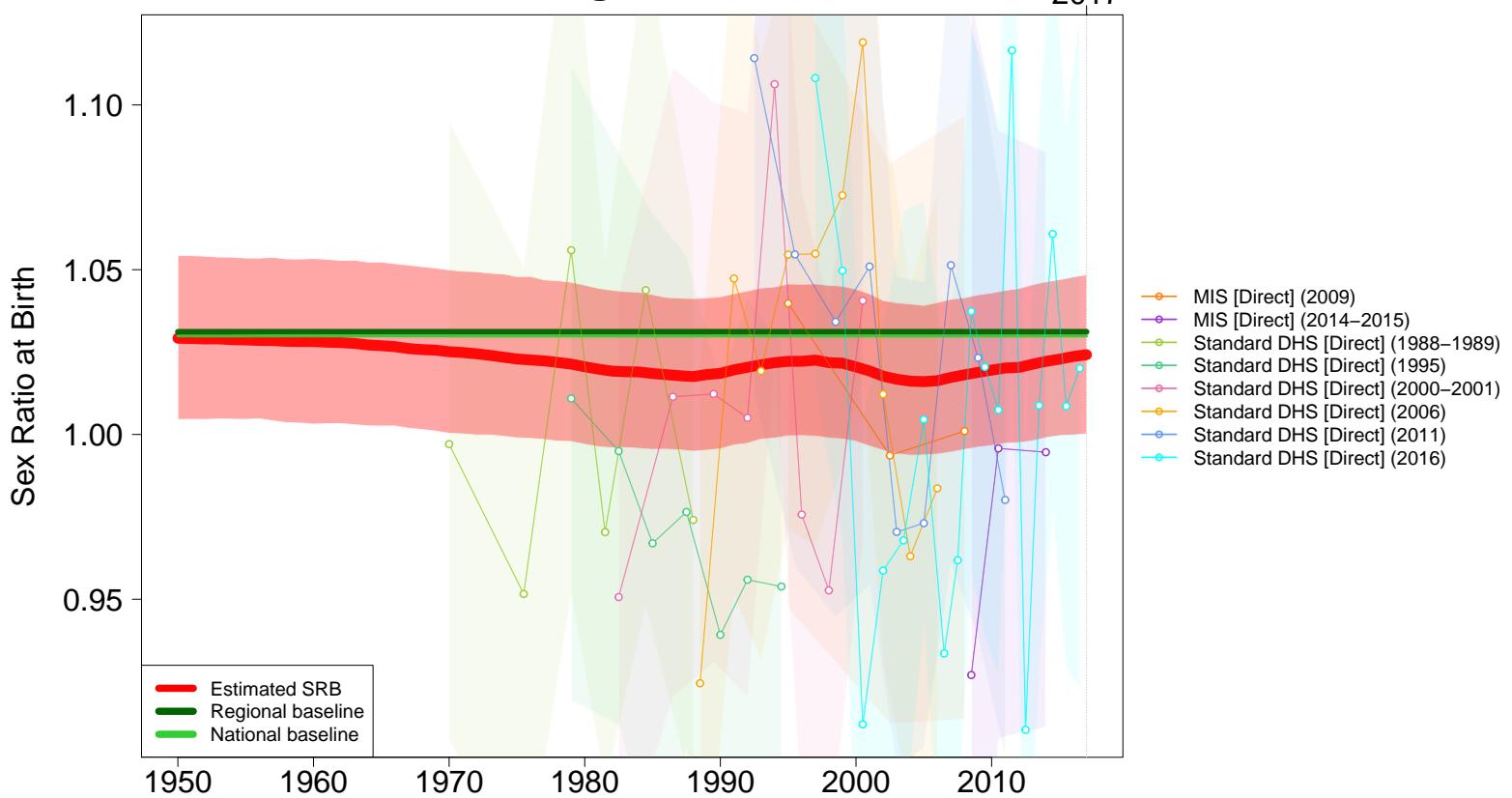


Tuvalu



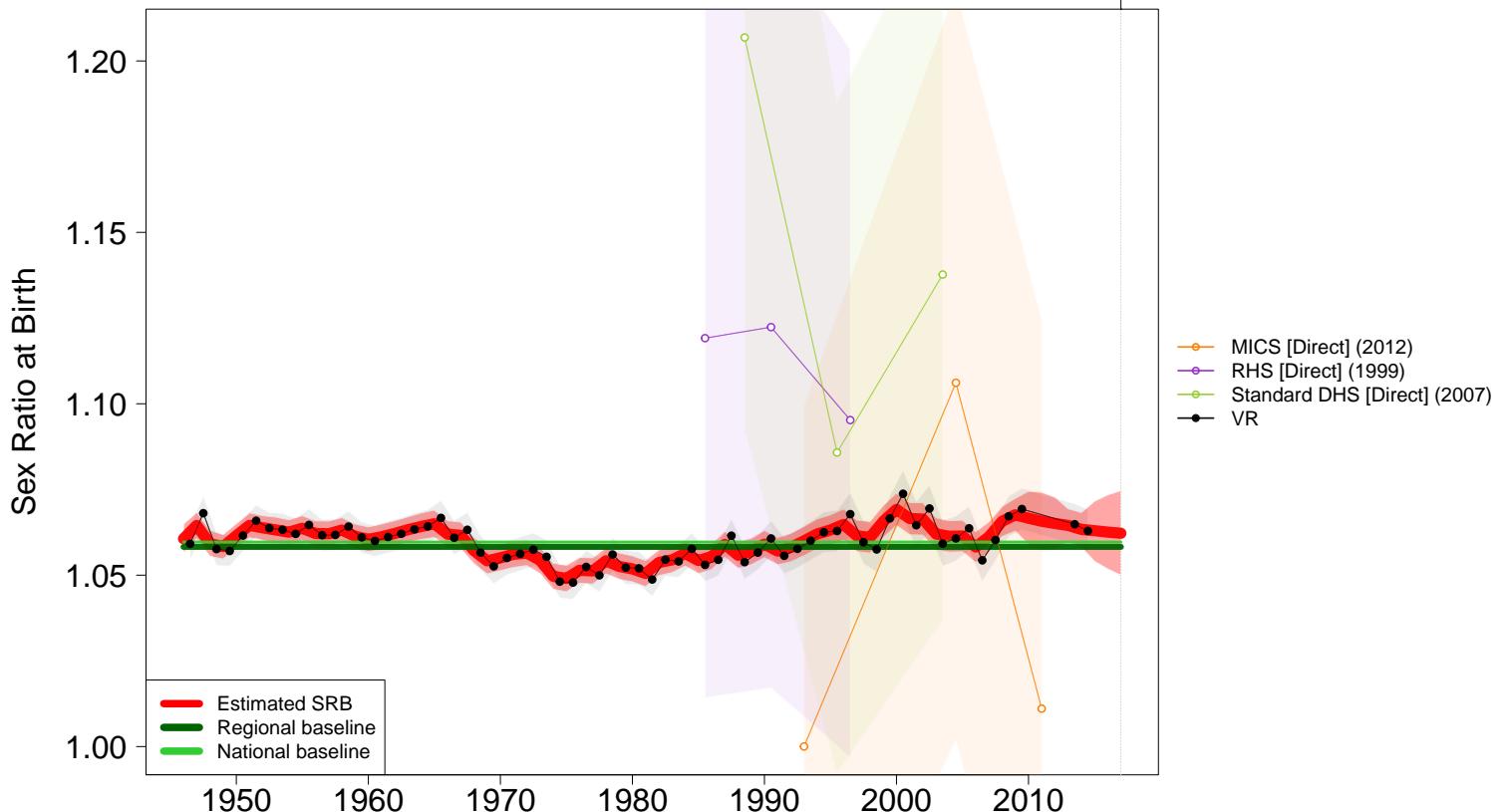
Uganda

2017



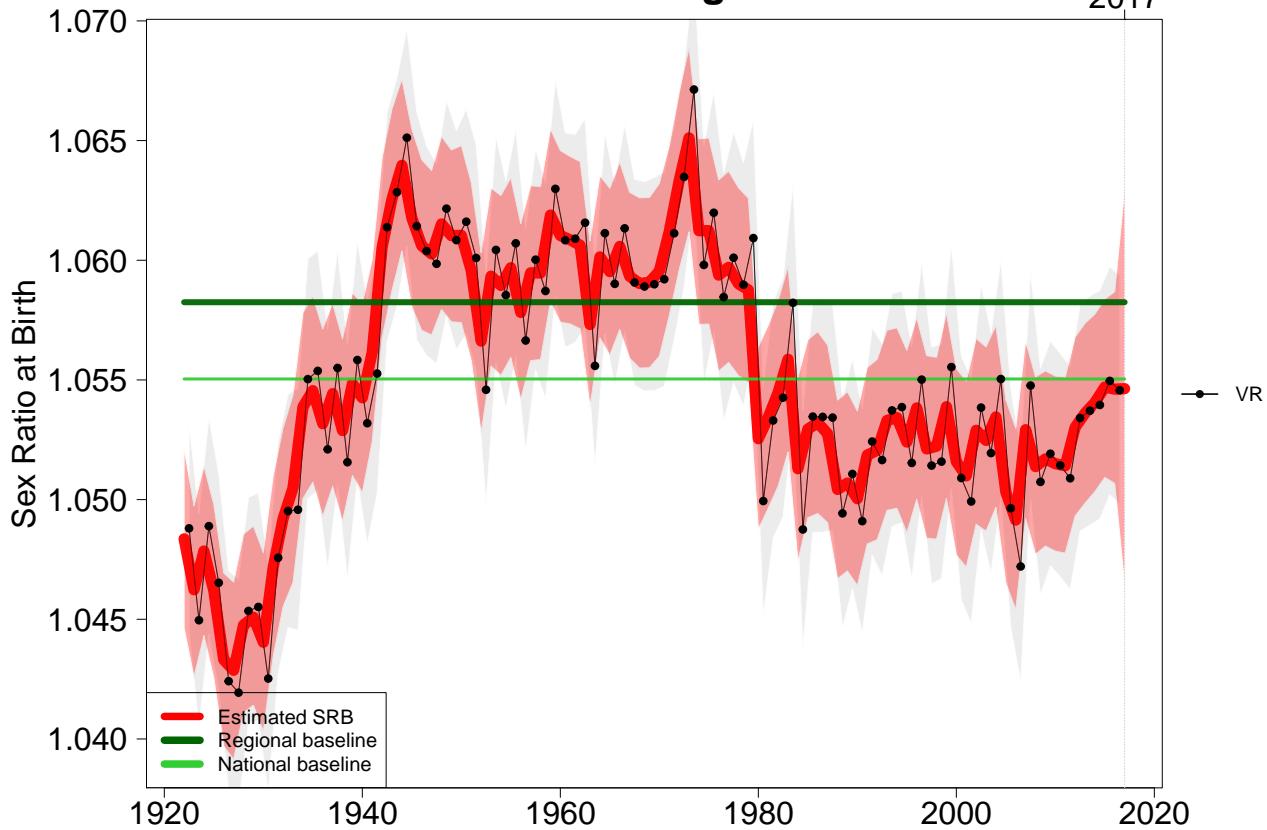
Ukraine

2017



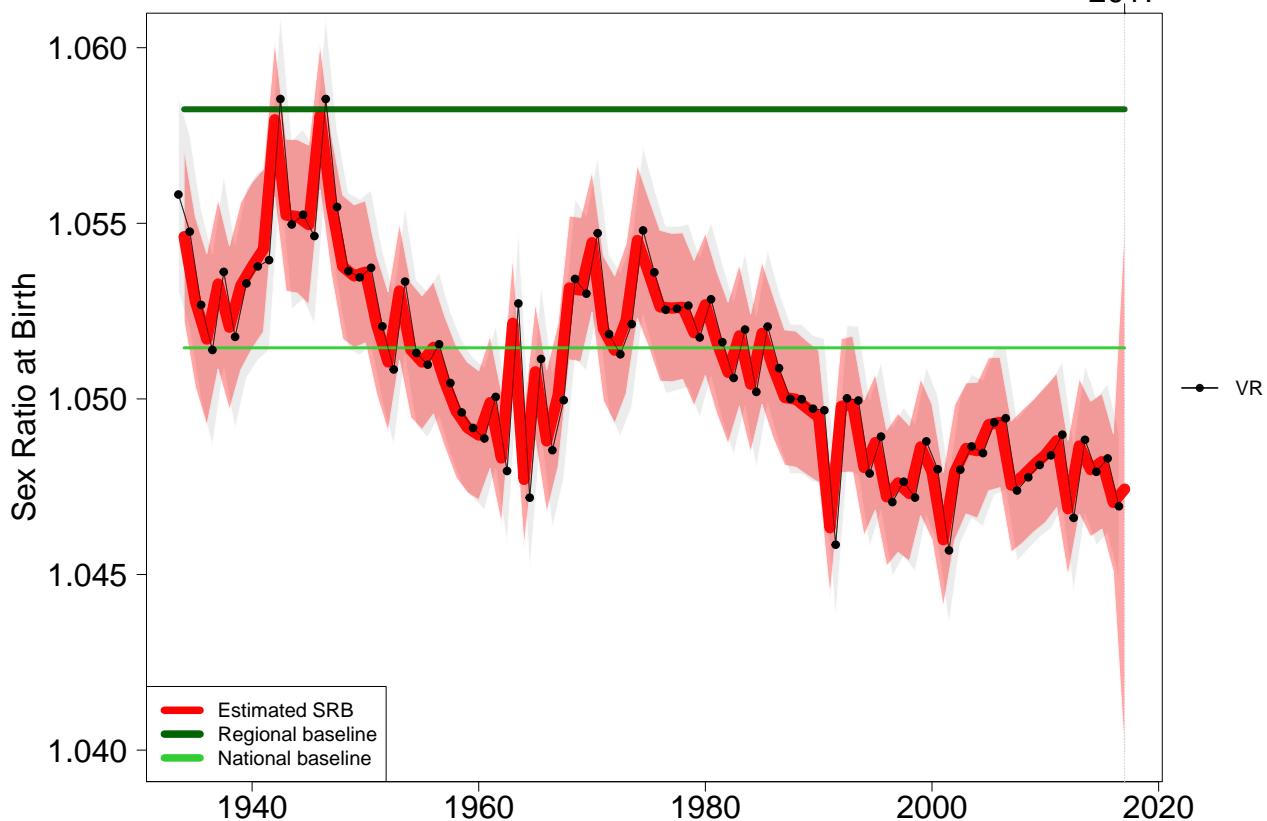
United Kingdom

2017



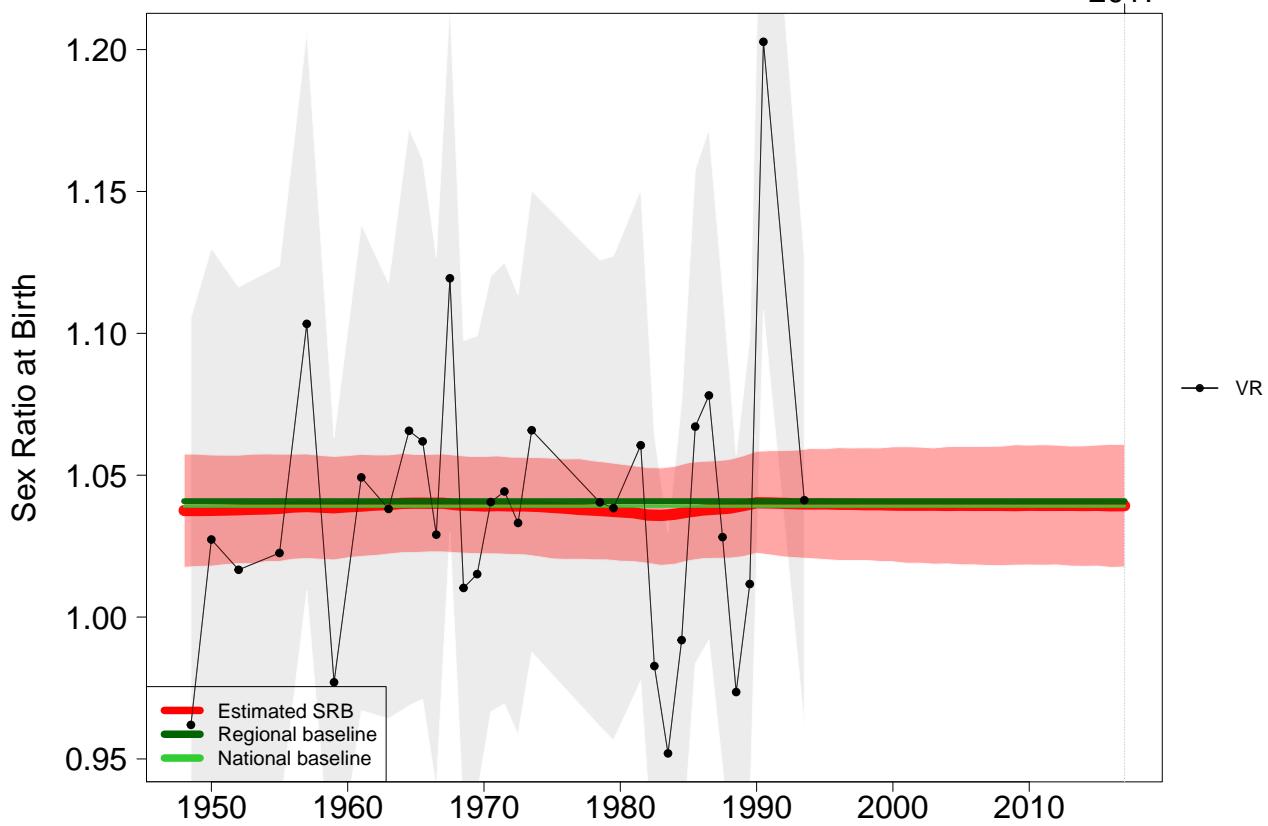
United States of America

2017



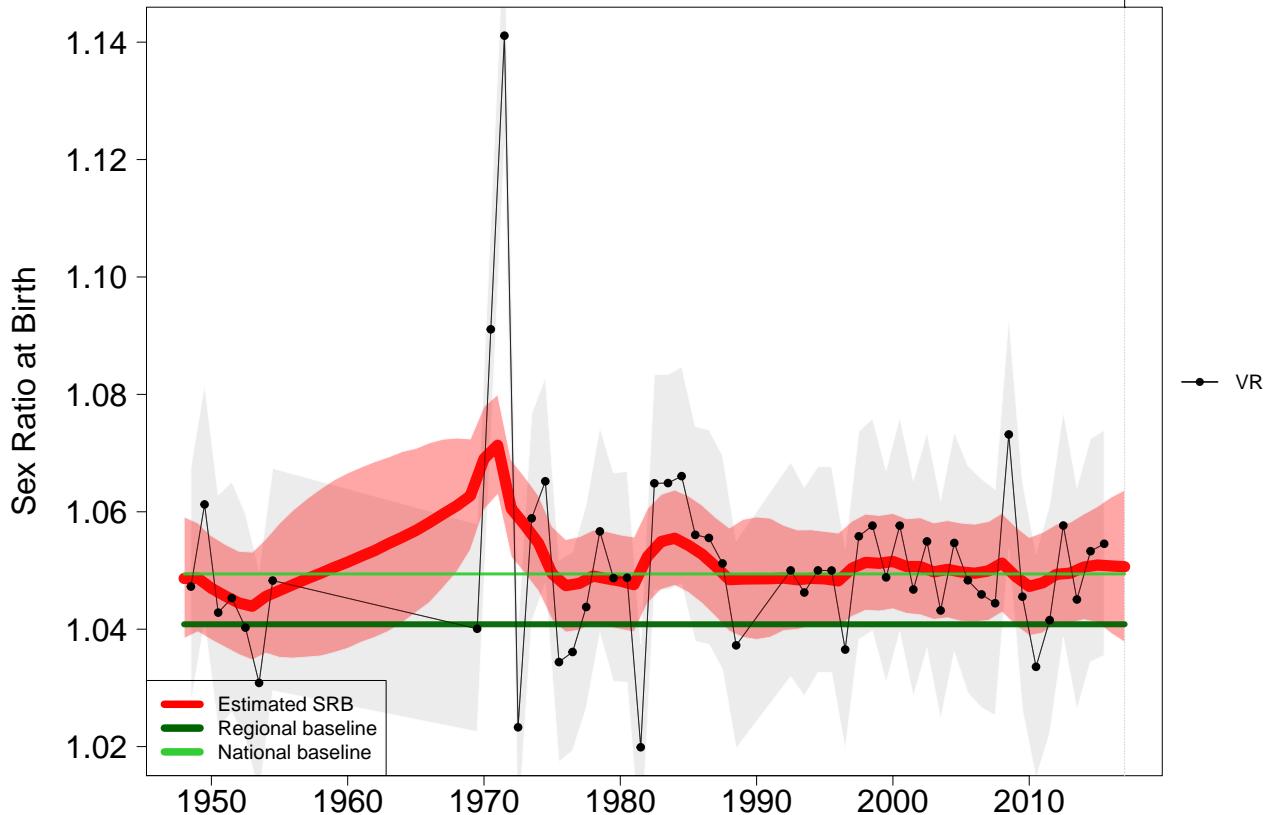
United States Virgin Islands

2017



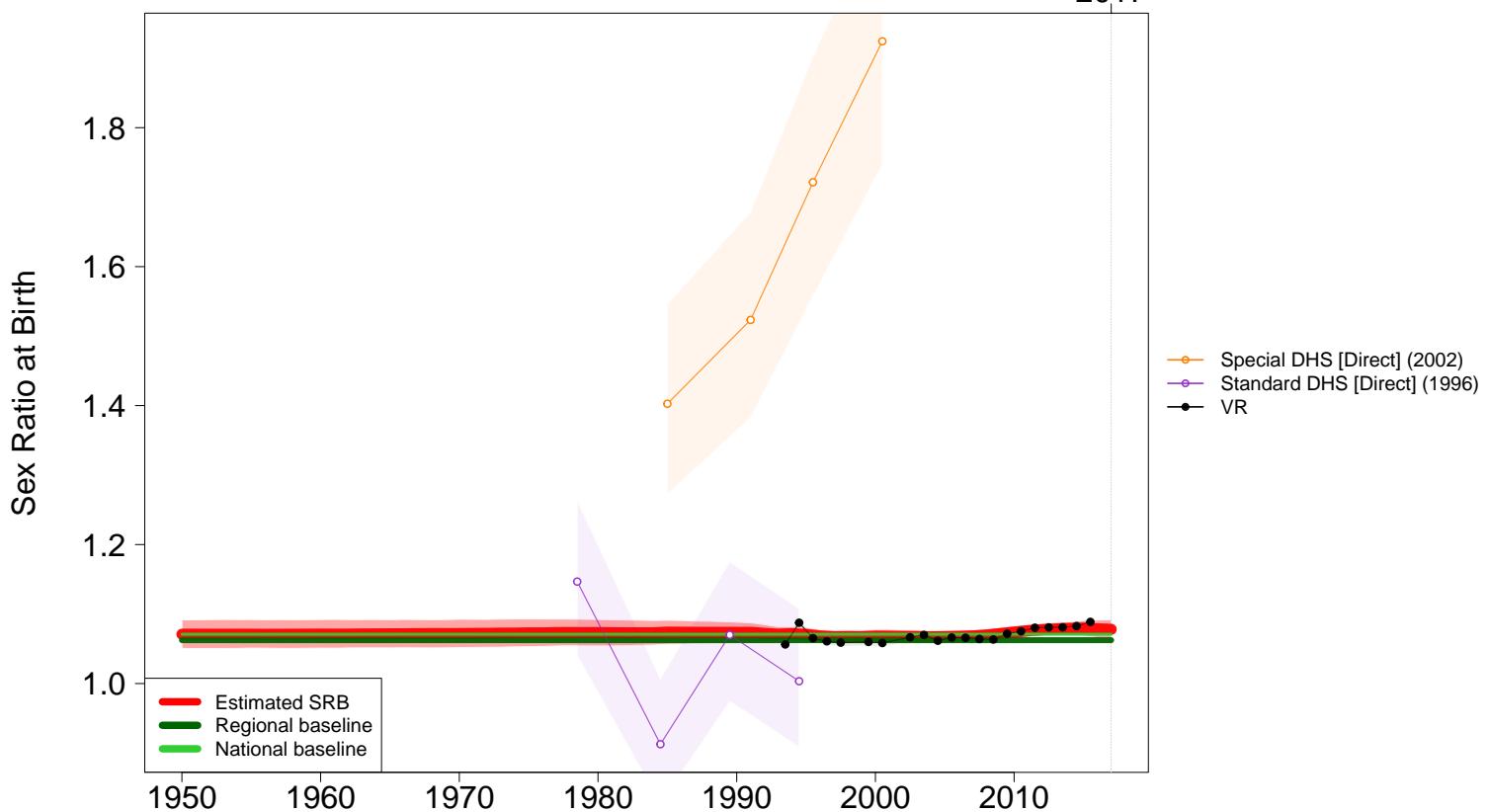
Uruguay

2017



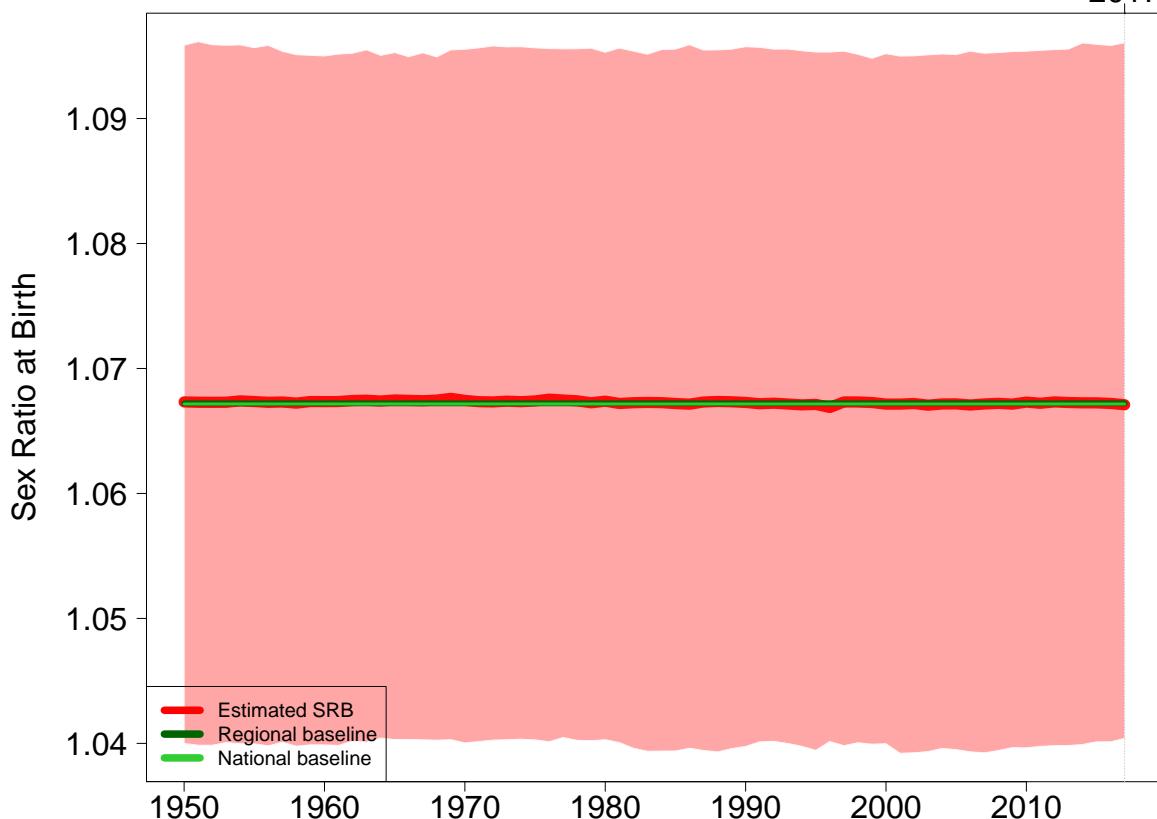
Uzbekistan

2017



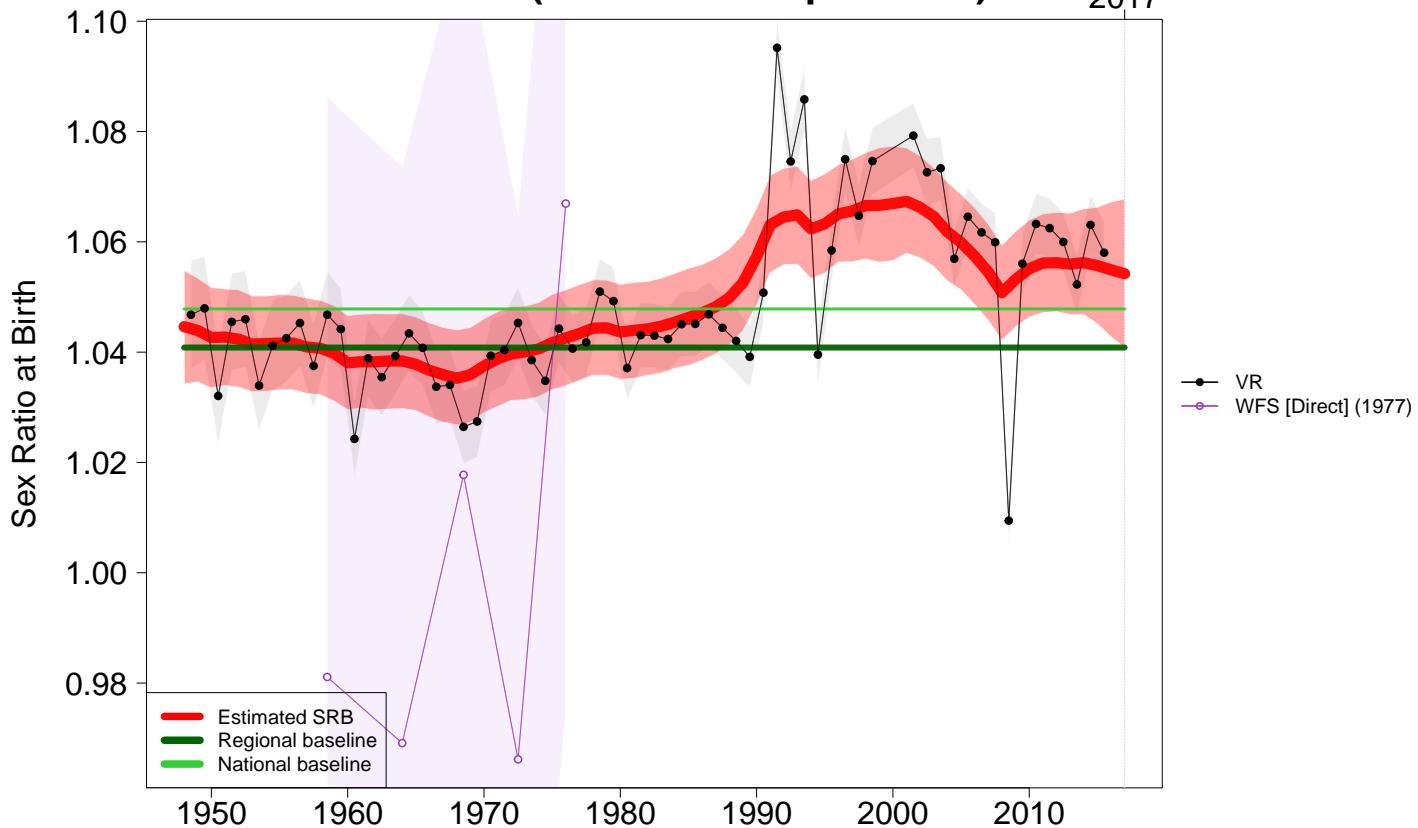
Vanuatu

2017



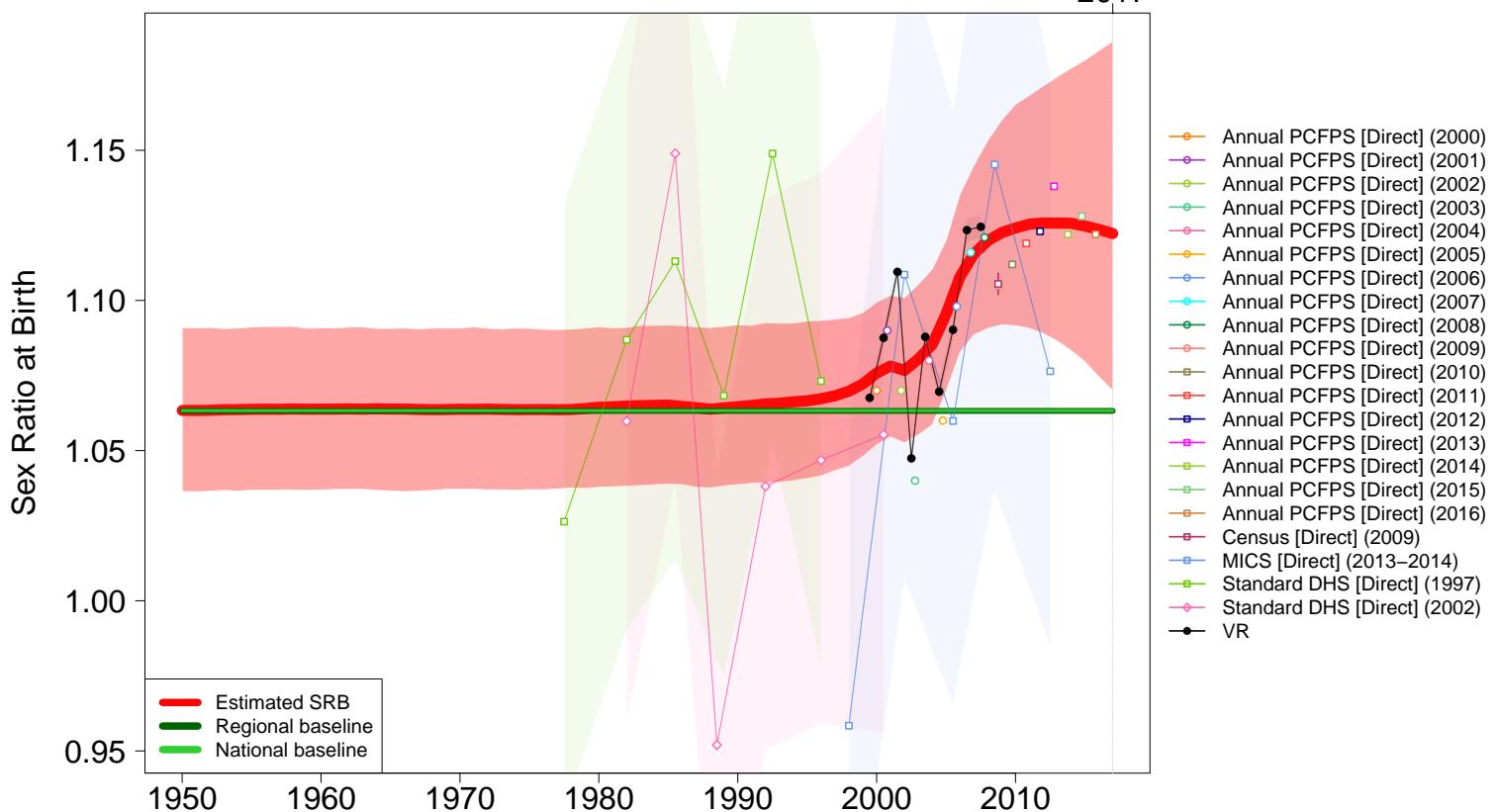
Venezuela (Bolivarian Republic of)

2017



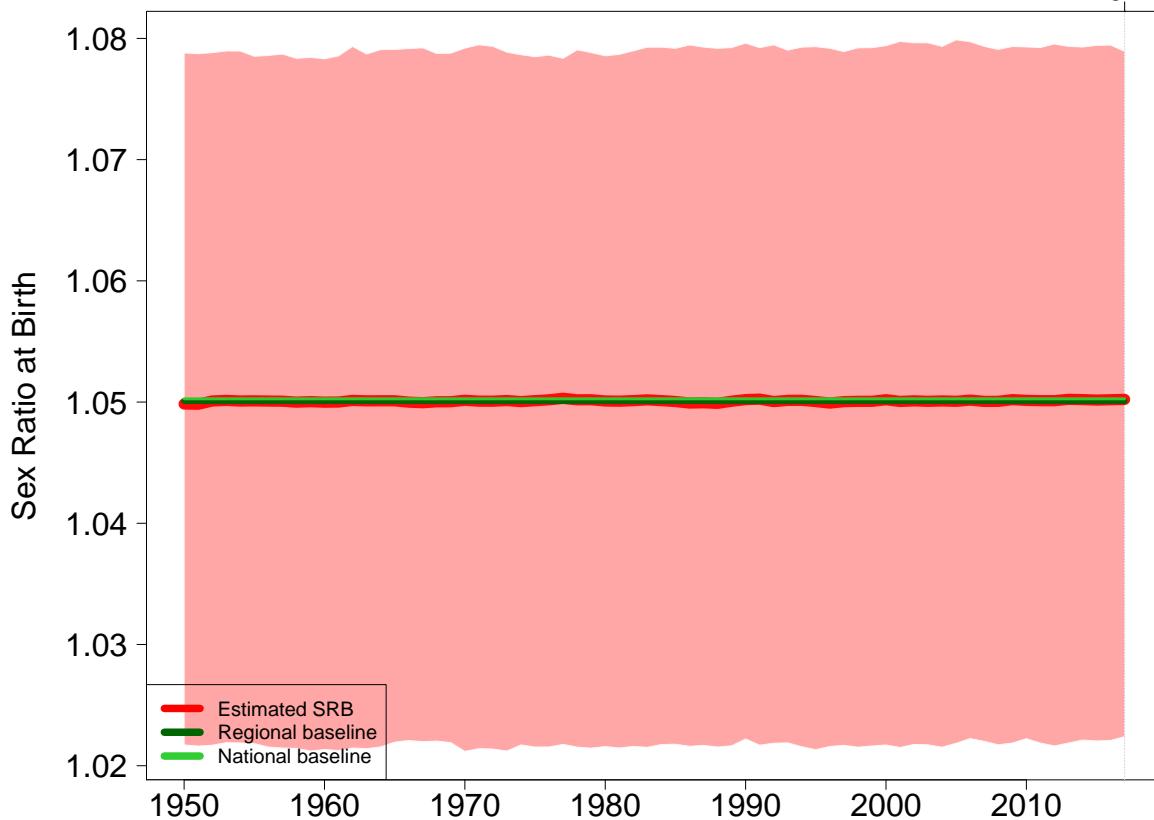
Vietnam

2017



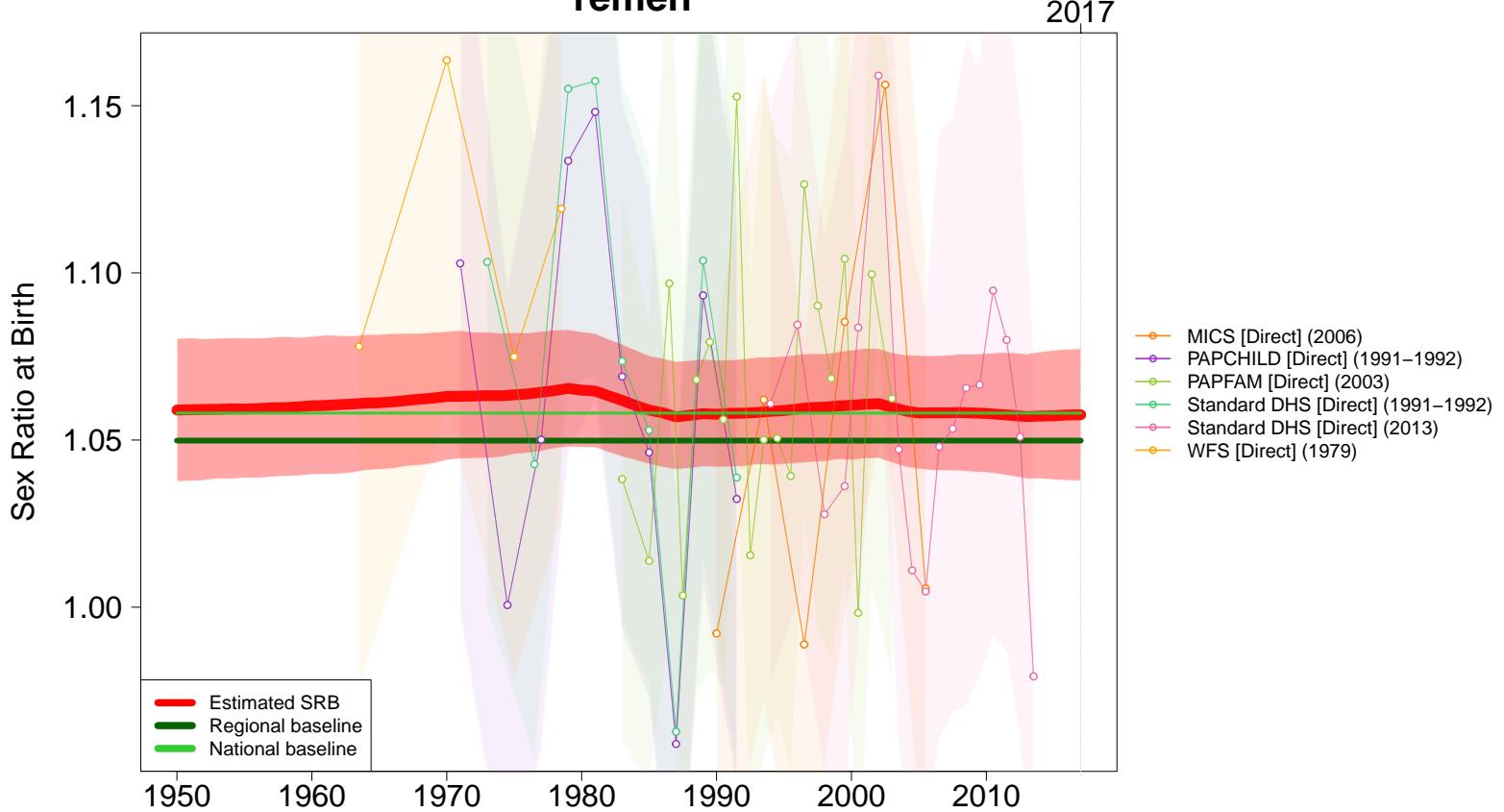
Western Sahara

2017



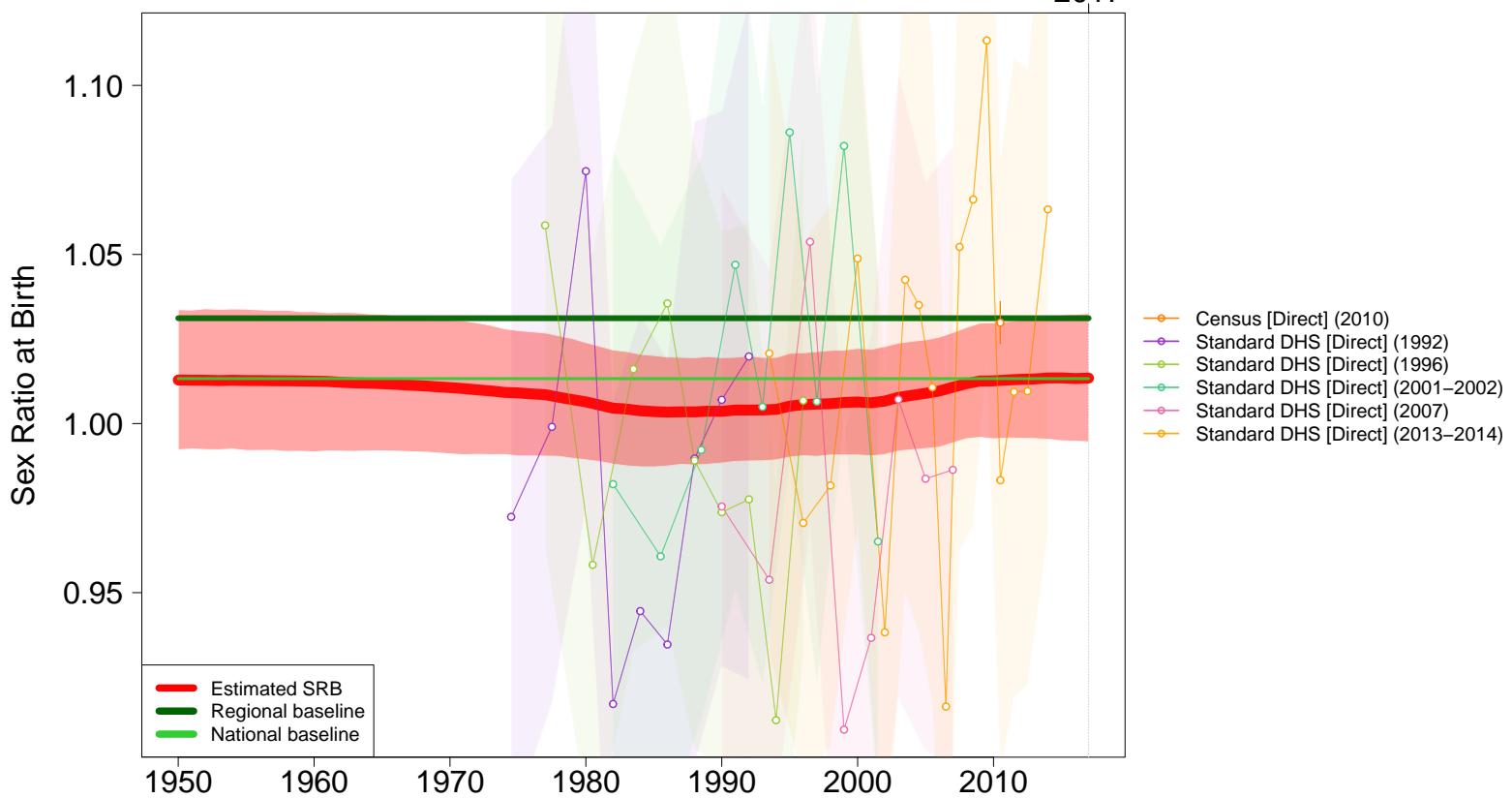
Yemen

2017



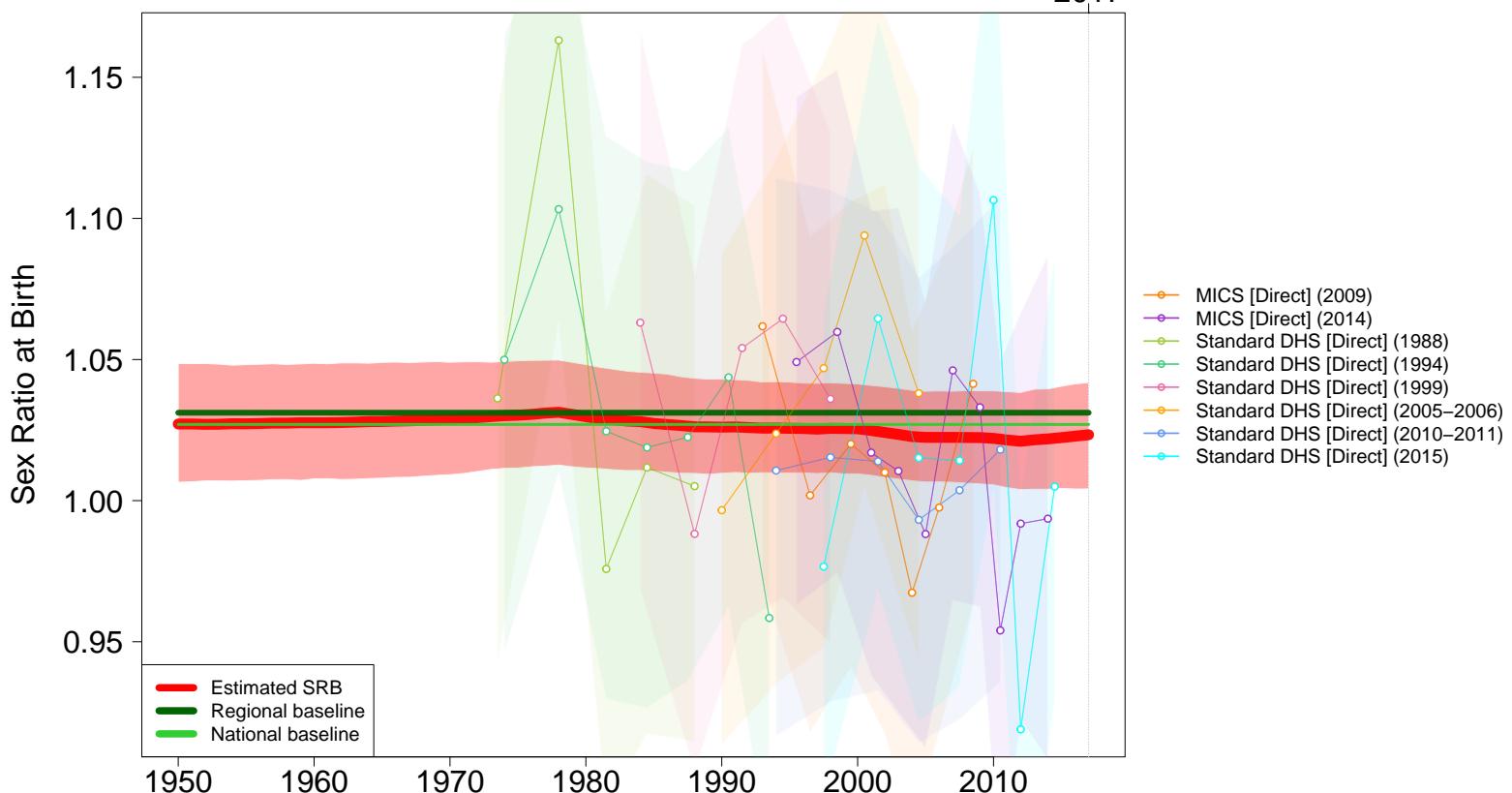
Zambia

2017



Zimbabwe

2017



— The End —