PAA 2015 Annual Meeting, San Diego, April 29th 2015

The HFD user's guide: available data and indicators, examples and illustrations

Tomas Sobotka and Dmitri Jdanov

The Human Fertility Data Project

Human Fertility Database: Expanding research opportunities

Member-initiated meeting

MAX PLANCK INSTITUTE FOR DEMOGRAPHIC RESEARCH
MAX-PLANCK-INSTITUT FÜR DEMOGRAFISCHE FORSCHUNG

Vienna Institute of Demography
ÖAW Österreichische Akademie der Wissenschaften

Background

Navigating HFD complexity

- HFD already contains a huge wealth of data: by a rough estimate, tens of millions of number records, and counting
  - Only period fertility tables for one country, Czech Republic, have >95,000 records)
- Large array of dimensions and indicators, including those relatively little used
- Supporting data & materials: warnings, documentation, input data, graphical representations of source data

→ This has a great potential to enrich the fertility research and contribute to its expansion both in breadth (adding countries & regions) and depth (studying new dimensions, providing more accurate and detailed evidence)

Agenda

Discussing and illustrating HFD data potential & opportunities

The HFC user's guide: a quick tour

1 Database structure & dimensions
2 Quick 'n easy job: HFD lite
3 Country data page: structure, supplementary materials
4 Fertility tables
5 Cohort data in HFD: advantages & drawbacks
6 HFC

Empirical illustrations

7 Empirical illustrations: Fertility tables
8 Empirical illustrations: Topics in fertility research

9 Using HFD efficiently

1 Database structure & dimensions

Human Fertility Database: Main Page

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Technical Reports
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The Human Fertility Database

Directors: Vladimir M. Shkolnikov (MPIDR) and Tomas Sobotka (VID)

The Human Fertility Database (HFD) is a joint project of the Max Planck Institute for Demographic Research (MPIDR) in Rostock, Germany and the Vienna Institute of Demography (VID) in Vienna, Austria, based at MPIDR. We seek to provide free and user-friendly access to detailed and high-quality data on period and cohort fertility and thus to facilitate research on changes and inter-country differences in fertility in the past and in the modern era. The HFD is entirely based on official vital statistics and places a great emphasis on data checking and documentation and on warranting data comparability across time and countries by means of uniform methodology. Read more

The MPIDR and the VID also collaborate on the Human Fertility Collection (www.fertilitydata.org), which is supplementing the HFD. The HFC incorporates a variety of valuable fertility data from diverse, not necessarily official, data sources. The major responsibility for the quality of data entering the HFC rests with data producers/providers. Therefore, HFC data, unlike those in the HFD, might be of lower quality.

For users who seek fast access to the most commonly used summary indicators of period and cohort fertility, we provide excel tables comprising the following indicators for all the HFD countries:

HFD summary indicators				
Total fertility rate	Mean age at birth	Mean age at first birth	Completed cohort fertility	Cohort childlessness

We seek to provide open, international access to these data. At present, the database contains detailed period and cohort fertility data for the following countries:

Detailed data by country				
Austria	Estonia	Japan	Slovakia	U.S.A.
Belarus	Finland	Lithuania	Slovenia	Ukraine
Bulgaria	France	Netherlands	Sweden	
Canada	⊞Germany	Norway	Switzerland	
Chile	Hungary	Portugal	Taiwan	
Czech Republic	Iceland	Russia	⊞U.K.	

The HFD will be continually updated and more countries will be added with time. Below we present countries which are on our "coming next" list. For these countries we provide only age-specific fertility rates based on the original official data. Please be aware that these data have not been fully processed, checked, and corrected and may not be free of mistakes and biases.

Preliminary release				
Ireland	Spain			

For more information, please begin by reading an overview of the database. If you have comments or questions, or trouble gaining access to the data, please contact us.

MAX PLANCK INSTITUTE FOR DEMOGRAPHIC RESEARCH

Joint project of the MPIDR and the VID, based at the MPIDR

Vienna Institute of Demography ÖAW

Main data dimensions

- Main layers of fertility data: births & fertility rates by age of mother (12-55+), birth order of child (0-5+, Total), period vs. cohort
- Tempo vs. Quantum of fertility
- Female population (exposure) data: age (12-55+) & age + parity estimates (0-4+)
- Additional datasets: input data: live births by months, census and register data on parity distribution of mothers
  - Input categories as obtained from the source data (e.g., wider birth order/parity categories)

2 Quick ‘n easy job: HFD lite

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Belarus	Finland	Lithuania	Slovenia	Ukraine
Bulgaria	France	Netherlands	Sweden	
Canada	⊞Germany	Norway	Switzerland	
Chile	Hungary	Portugal	Taiwan	
Czech Republic	Iceland	Russia	⊞U.K.	

The HFD will be continually updated and more countries will be added with time. Below we present countries which are on our "coming next" list. For these countries we provide only age-specific fertility rates based on the original official data. Please be aware that these data have not been fully processed, checked, and corrected and may not be free of mistakes and biases.

Preliminary release				
Ireland	Spain			

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Joint project of the MPIDR and the VID, based at the MPIDR

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The “HFD-lite”

- For users who seek fast access to most commonly used indicators of period and cohort fertility.
- All countries & time series in one Excel file.
- Free access *without registration*.
- Five indicators at present:
  - ✓ total fertility rates;
  - ✓ mean age at birth;
  - ✓ mean age at first birth;
  - ✓ completed cohort fertility rate;
  - ✓ cohort childlessness

3 Country data page: Structure, materials

HFD country page

Human Fertility Database

U.S.A.

Summary Indicators | Age-Specific Data | Fertility Tables | Input Data

Background and Documentation PDF

Period summary indicators

	All birth orders combined	By birth order
Total number of live births	1933-2010	1933-2010
Crude birth rate	1933-2010	1933-2010
Total fertility rate	1933-2010	1933-2010
Mean age at birth	1933-2010	1933-2010
Standard deviation in mean age at birth	1933-2010	1933-2010

Cohort summary indicators

	All birth orders combined	By birth order
Completed cohort fertility	1918-1970	1918-1970
Parity progression ratios	-	1918-1960
Mean age at birth	1918-1970	1918-1970
Standard deviation in mean age at birth	1918-1970	1918-1970

Other synthetic indicators

	All birth orders combined	By birth order
Tempo-adjusted TFR	1934-2009	1934-2009

Data sources PDF

All country data in one zip file ZIP

Country page last updated: 2013-02-06

Pemanent URL for this dataset: http://www.humanfertility.org/cgi-bin/country.php?country=USA&update=20130206

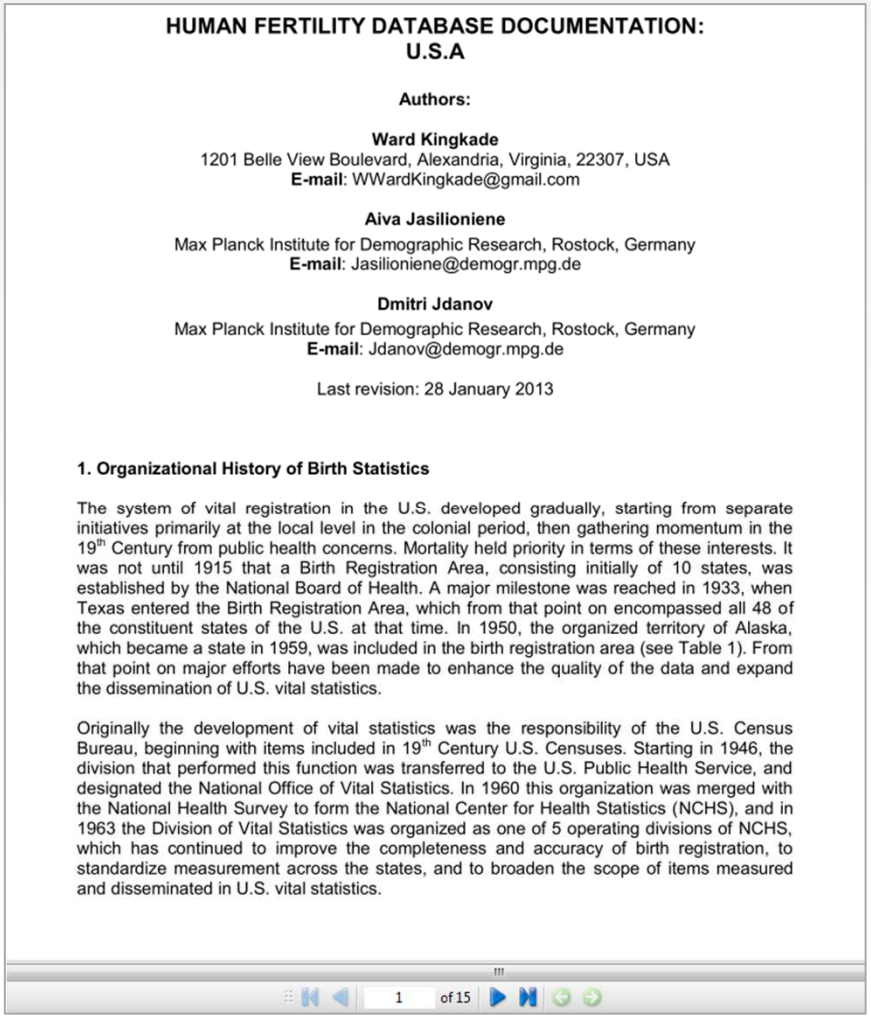
Background and Documentation

The HFD provides detailed data documentation for every country. It includes:

1) Background and documentation, providing information about data quality, coverage, specific data problems, territorial changes, historical peculiarities, and other important comments.

2) Notes, providing details about specific data points in the data files.

3) References to the data sources.



HUMAN FERTILITY DATABASE DOCUMENTATION:
U.S.A

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Last revision: 28 January 2013

1. Organizational History of Birth Statistics

The system of vital registration in the U.S. developed gradually, starting from separate initiatives primarily at the local level in the colonial period, then gathering momentum in the 19th Century from public health concerns. Mortality held priority in terms of these interests. It was not until 1915 that a Birth Registration Area, consisting initially of 10 states, was established by the National Board of Health. A major milestone was reached in 1933, when Texas entered the Birth Registration Area, which from that point on encompassed all 48 of the constituent states of the U.S. at that time. In 1950, the organized territory of Alaska, which became a state in 1959, was included in the birth registration area (see Table 1). From that point on major efforts have been made to enhance the quality of the data and expand the dissemination of U.S. vital statistics.

Originally the development of vital statistics was the responsibility of the U.S. Census Bureau, beginning with items included in 19th Century U.S. Censuses. Starting in 1946, the division that performed this function was transferred to the U.S. Public Health Service, and designated the National Office of Vital Statistics. In 1960 this organization was merged with the National Health Survey to form the National Center for Health Statistics (NCHS), and in 1963 the Division of Vital Statistics was organized as one of 5 operating divisions of NCHS, which has continued to improve the completeness and accuracy of birth registration, to standardize measurement across the states, and to broaden the scope of items measured and disseminated in U.S. vital statistics.

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Background and Documentation file for USA

HFD country page

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Period summary indicators

	All birth orders combined	By birth order
Total number of live births	1933-2010	1933-2010
Crude birth rate	1933-2010	1933-2010
Total fertility rate	1933-2010	1933-2010
Mean age at birth	1933-2010	1933-2010
Standard deviation in mean age at birth	1933-2010	1933-2010

Cohort summary indicators

	All birth orders combined	By birth order
Completed cohort fertility	1918-1970	1918-1970
Parity progression ratios	-	1918-1960
Mean age at birth	1918-1970	1918-1970
Standard deviation in mean age at birth	1918-1970	1918-1970

Other synthetic indicators

	All birth orders combined	By birth order
Tempo-adjusted TFR	1934-2009	1934-2009

Data sources PDF

All country data in one zip file ZIP

Country page last updated: 2013-02-06
Pemanent URL for this dataset: http://www.humanfertility.org/cgi-bin/country.php?country=USA&update=20130206

HFD data format

USAtfrRR - Notepad

File Edit Format View Help

United States, Period total fertility rates and period total fertility rates by age 40
Last modified: 25/01/2013

Year	TFR	TFR40
1933	2.012	1.911
1934	2.072	1.973
1935	2.038	1.944
1936	2.007	1.919
1937	2.038	1.955
1938	2.092	2.010
1939	2.050	1.974
1940	2.113	2.037
1941	2.226	2.152
1942	2.465	2.392
1943	2.566	2.489
1944	2.439	2.359
1945	2.380	2.297
1946	2.830	2.747
1947	3.161	3.077
1948	3.009	2.930
1949	3.022	2.945
1950	3.020	2.944
1951	3.203	3.124
1952	3.302	3.222
1953	3.372	3.292
1954	3.494	3.411
1955	3.538	3.456
1956	3.654	3.570
1957	3.738	3.654
1958	3.689	3.609
1959	3.689	3.609
1960	3.667	3.587
1961	3.626	3.545
1962	3.481	3.403
1963	3.354	3.280
1964	3.222	3.149
1965	2.926	2.858
1966	2.714	2.651
1967	2.564	2.507
1968	2.467	2.416
1969	2.457	2.410
1970	2.461	2.417
1971	2.268	2.230
1972	2.008	1.975
1973	1.871	1.842
1974	1.827	1.802
1975	1.769	1.744
1976	1.739	1.716

Ln 1, Col 1

HFD country page: age-specific data

Human Fertility Database

U.S.A.

Summary Indicators | Age-Specific Data | Fertility Tables | Input Data

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Birth counts, population exposures, and rates: period

	All birth orders combined			By birth order		
	year, age, cohort	year, age	year, cohort	year, age, cohort	year, age	year, cohort
Birth counts	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010
Female population exposure	1933-2010	1933-2010	1933-2010	-	-	-
Age-specific fertility rates	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010
Cumulative fertility rates	-	1933-2010	1933-2010	-	1933-2010	1933-2010

Birth counts, population exposures, and rates: cohort

	All birth orders combined	By birth order
Birth counts	1878-1997	1878-1997
Female population exposure	1878-1997	-
Age-specific fertility rates	1878-1997	1878-1997
Cumulative fertility rates	1918-1997	1918-1997

Data sources PDF

All country data in one zip file ZIP

Country page last updated: 2013-02-06

Pemanent URL for this dataset: http://www.humanfertility.org/cgi-bin/country.php?country=USA&update=20130206

HFD country page: input data

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Input data

	Years
Births	1931-2010
Births by month	1931-2010
Women by age and parity	1910, ... , 1970
Population size and deaths	Human Mortality Database
Notes	PDF
References	PDF

Lexis maps

	Map
Births	PDF
Population size	PNG
Death counts	PNG

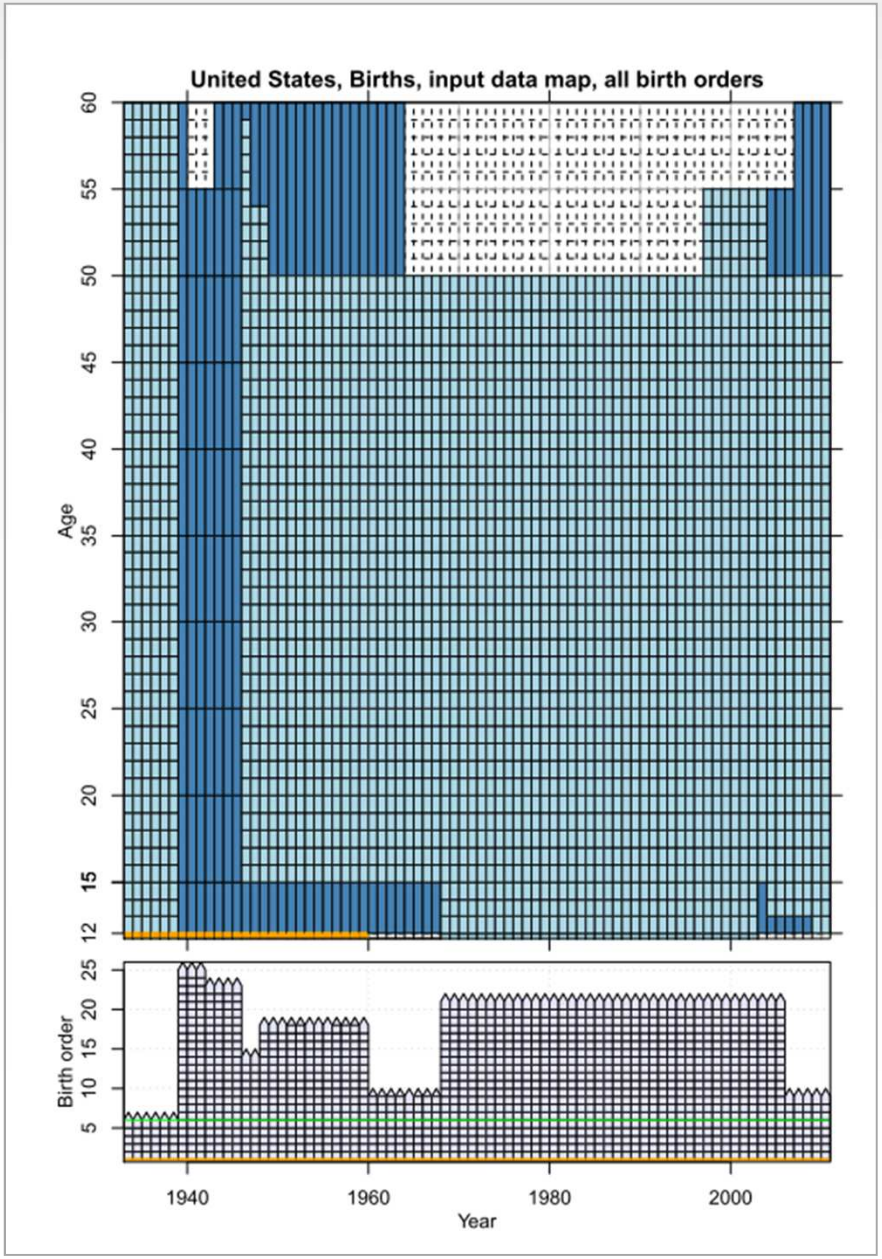
Data sources PDF

All country data in one zip file ZIP

Country page last updated: 2013-02-06

Pemanent URL for this dataset: http://www.humanfertility.org/cgi-bin/country.php?country=USA&update=20130206

Input Data Map



Notes

THE UNITED STATES Last revision: 17-01-2013

1
The system of vital registration developed gradually in the U.S. It was only from 1933, when Texas entered the birth registration area, that it encompassed all 48 of the constituent states of the U.S. at that time. Alaska and Hawaii were added in 1959 and 1960, respectively, when they became states. Prior to their inclusion as states, data for these "organized territories", including Puerto Rico and the Virgin Islands, were provided in supplements to the National Vital Statistics volumes.

2
Area=4. Birth counts by single years of age and birth order for 1931 and 1932 do not include the territories of Colorado, Maine, Massachusetts, New Hampshire, and Rhode Island. See Appendix 2 in the US Background and Documentation file for more information on area coding used in the input data files.

3
Area=5. Birth counts by single years of age and birth order for 1933 do not include the territories of Colorado, Massachusetts, and New Hampshire. See Appendix 2 in the US Background and Documentation file for more information on area coding used in the input data files.

4
Area=6. Birth counts by single years of age and birth order for 1934-1938 do not include the territories of Massachusetts and New Hampshire. See Appendix 2 in the US Background and Documentation file for more information on area coding used in the input data files.

5
Figures on birth order for Massachusetts for the period 1939-1959 are included in the “total” and “unknown” classifications only. The state of Massachusetts did not require the reporting of such information in the given period.

6
Data pertain to the total population of the U.S. (i.e., cover all races) and were obtained by summing up the data from two categories: “white” and “all other races” or “white” and “non-white” or “male” and “female”.

7
Figures on unknown age of the mother are distributed across all known ages.

8
Data pertain to ever married women only.

9
Data pertain to single women only. No information on parity of these is provided by the census.

4 Fertility tables

Fertility Tables

Human Fertility Database

U.S.A.

Summary Indicators | Age-Specific Data | Fertility Tables | Input Data

Background and Documentation PDF

Period fertility tables

	HFD parity estimates	Census- or register-based parity estimates
Fertility tables	1963-2010	no data
Female population exposure by parity	1963-2010	no data
Conditional age-specific fertility rates	1963-2010	no data
Parity- and age-adjusted TFR (PATFR)	1963-2010	no data
Table mean ages at birth	1963-2010	no data

Cohort fertility tables

	HFD parity estimates
Fertility tables	1918-1985

Data sources PDF

All country data in one zip file ZIP

Country page last updated: 2013-02-06

Pemanent URL for this dataset: http://www.humanfertility.org/cgi-bin/country.php?country=USA&update=20130206

Main purpose

- *Allowing in-depth analysis of parity-specific patterns of family building*
- Main advantage: controlling for the parity distribution of the female population at each age
- Building blocs: (conditional) age- and parity-specific fertility rates (*mi*) and probabilities (*qi*)

Period and Cohort Fertility Tables

- Increment-decrement life tables modeling the process of childbearing in female cohorts by age and parity

- A two-dimensional progression toward older age and higher parities.

- Fertility table functions are computed from the schedule of age- and parity-specific fertility rates as major input data; see details in the *HFD Methods protocol*

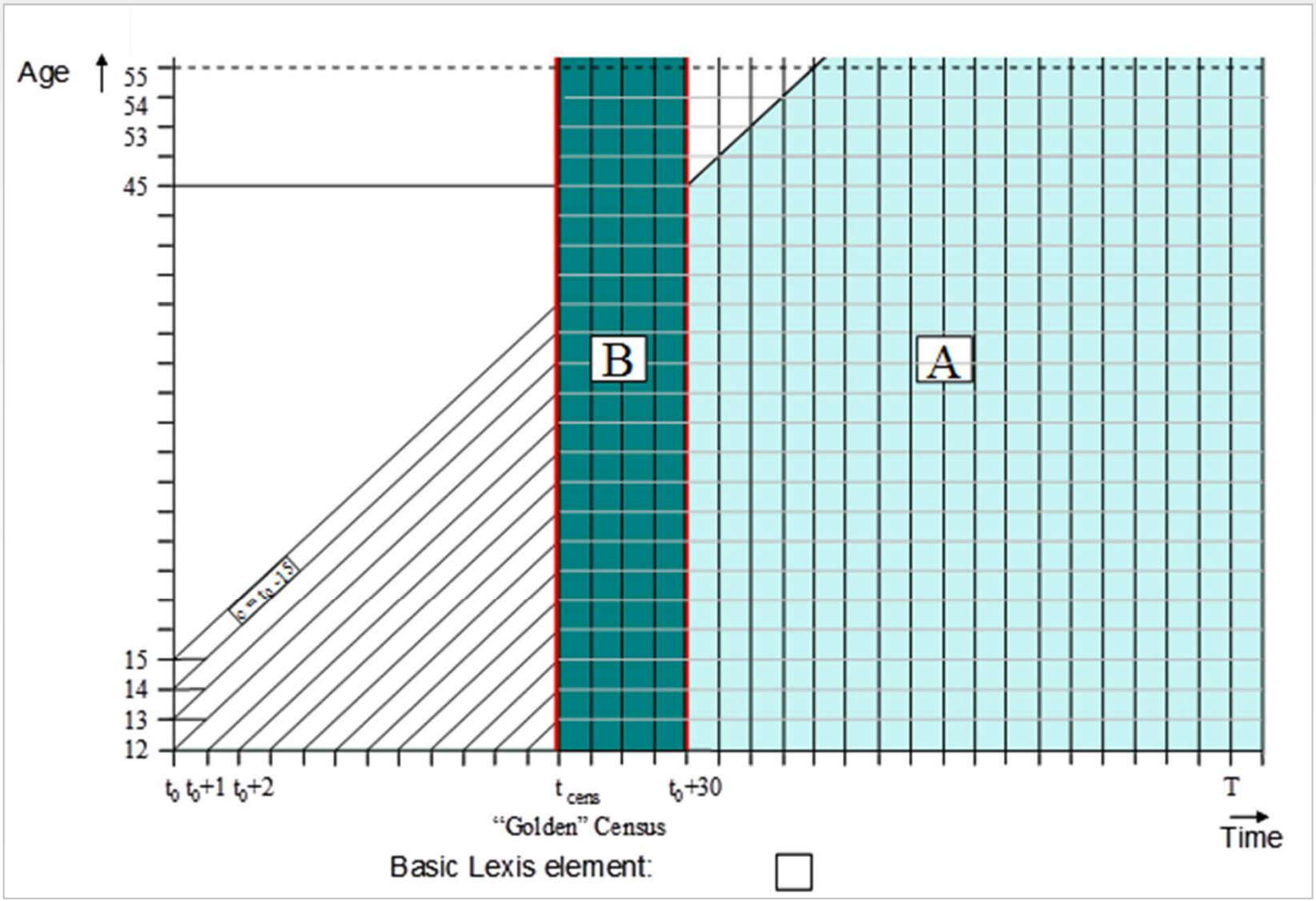
Period tables: Describe the fertility progression in a 'synthetic cohort' of women on the basis of conditional age- and parity-specific fertility rates observed during one calendar year.

Key output: summary index of period fertility controlling for age and parity, PATFR, and its order-specific components.

Examples of other indicators:

- (Conditional) probability of having a child before age 40 if childless at age 30
- Cumulative (lifetime) probability of having another child for women of parity 1 at age 25

Lexis regions for the period fertility tables



5 HFD cohort data: advantages & drawbacks

HFD cohort data: advantages & drawbacks

Cohort data: the “real picture” of family building, little affected by period ups and downs

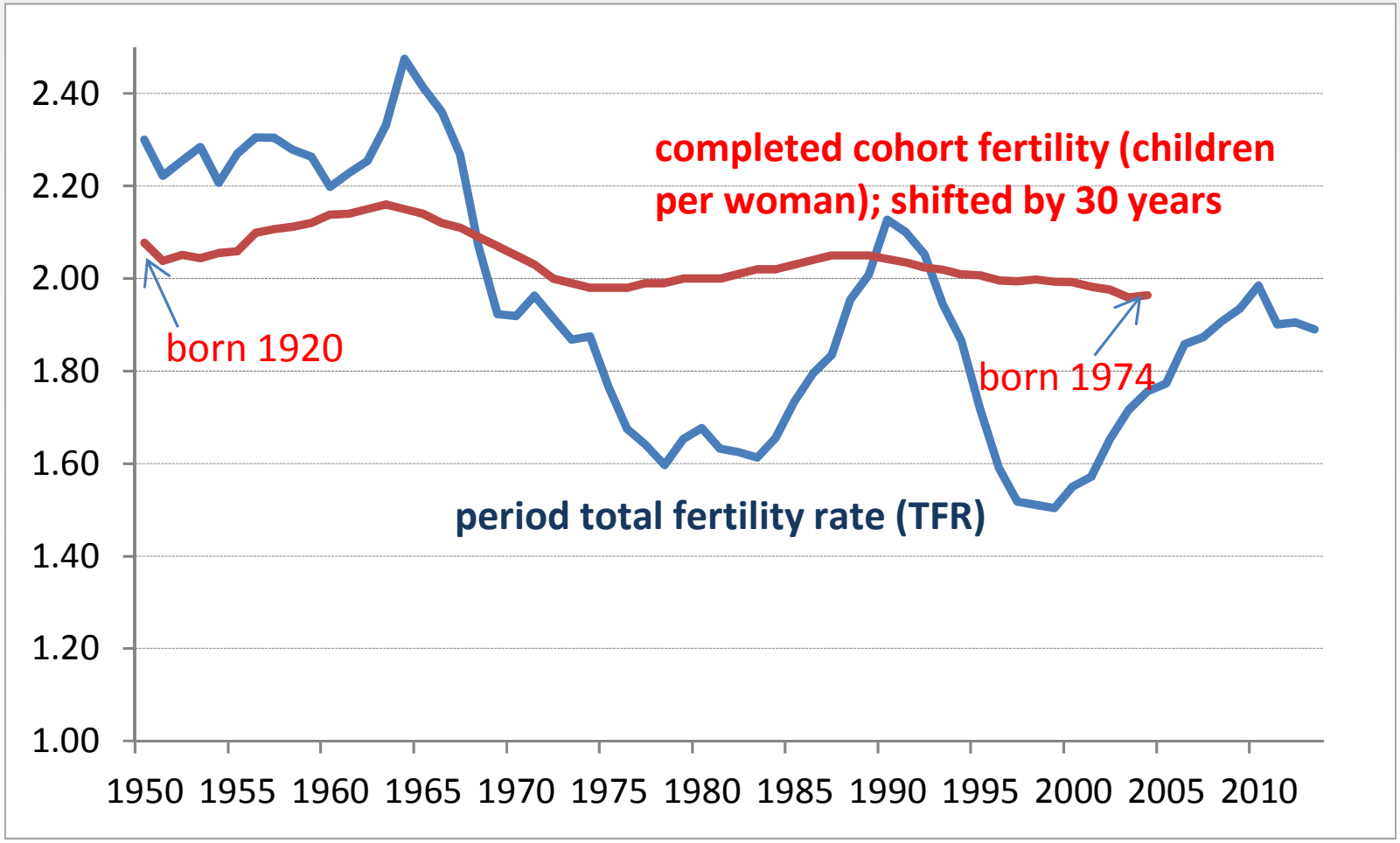
- No tempo effects
- No interpretation ambiguity
- Completed fertility can be disaggregated into parity components

HFD challenges in reconstructing cohort data

- Building blocs: period Lexis triangles & parallelograms
- Limited data availability: Long time series needed to reconstruct the whole reproductive history of one cohort: 31 years to cover ages 15-45
- Reconstructed cohort fertility does not reflect well migrants’ fertility histories → may distort national cohort data & estimates
- Sensitivity to birth order data, childlessness estimates particularly vulnerable and potentially unstable
- Cohort parity estimates might be distorted when the input data provided in a 5-year ages format (and split using standard HFD procedures)

→ *Caution needed, careful checking of documentation files recommended*

Period vs. cohort data: Sweden



How to obtain the “almost completed” fertility?

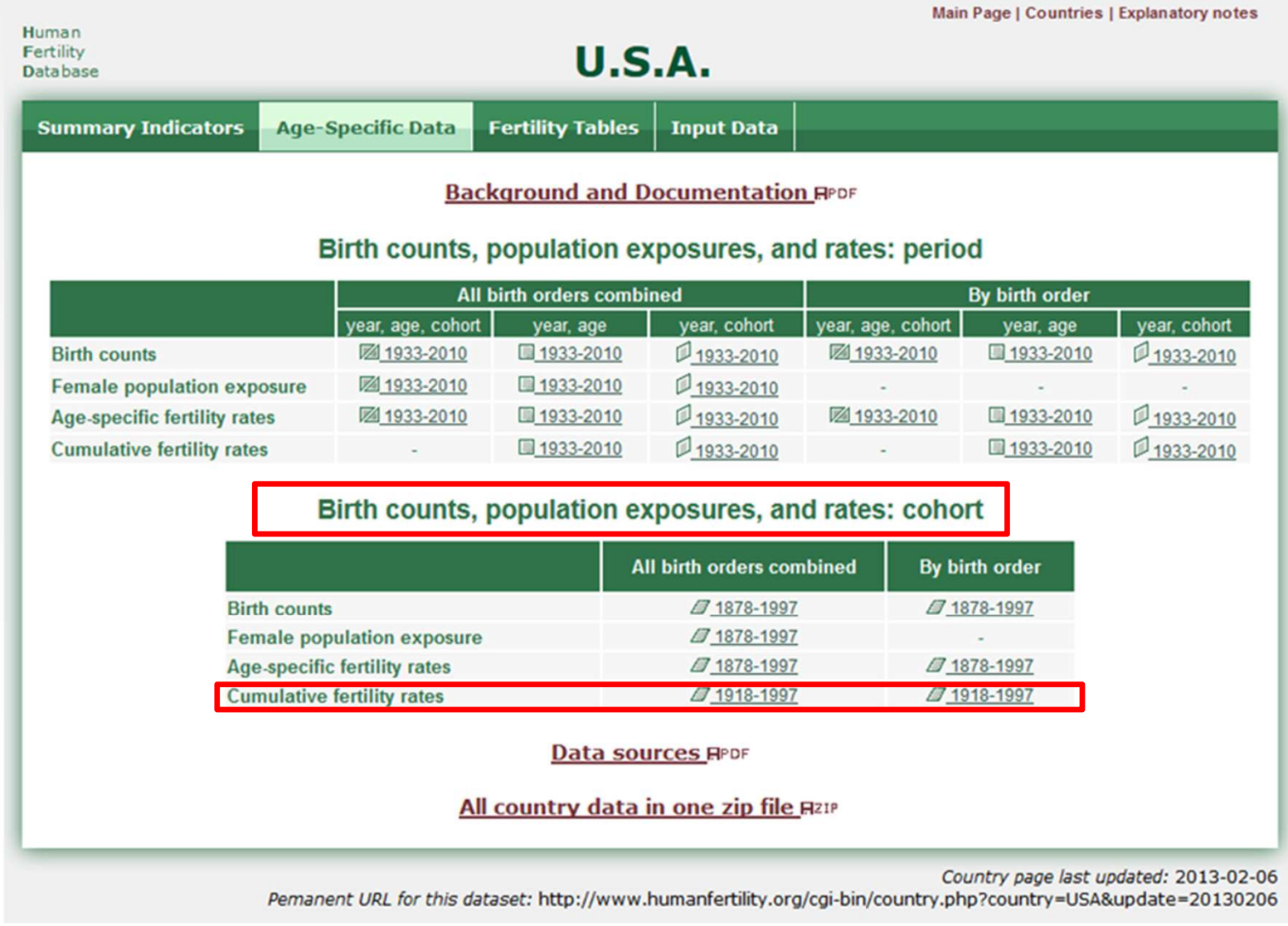
HFD summary indicators for each country

- Completed cohort fertility (by age 50) and cumulated cohort fertility at age 40
- The *HFD-lite* Excel file shows completed CTFR estimates by age 44

Users may analyse trends in (almost) completed fertility by studying cumulative data & choosing their own age categories

- *Additional long-term series found in census-based parity distributions in input data*

How to obtain the “almost completed” fertility?



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Birth counts, population exposures, and rates: period

	All birth orders combined			By birth order		
	year, age, cohort	year, age	year, cohort	year, age, cohort	year, age	year, cohort
Birth counts	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010
Female population exposure	1933-2010	1933-2010	1933-2010	-	-	-
Age-specific fertility rates	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010	1933-2010
Cumulative fertility rates	-	1933-2010	1933-2010	-	1933-2010	1933-2010

Birth counts, population exposures, and rates: cohort

	All birth orders combined	By birth order
Birth counts	1878-1997	1878-1997
Female population exposure	1878-1997	-
Age-specific fertility rates	1878-1997	1878-1997
Cumulative fertility rates	1918-1997	1918-1997

Data sources PDF

All country data in one zip file ZIP

Country page last updated: 2013-02-06

Pemanent URL for this dataset: http://www.humanfertility.org/cgi-bin/country.php?country=USA&update=20130206

How to obtain the “almost completed” fertility?

USAccfrVHbo - Notepad

File Edit Format View Help

United States, Cumulative cohort fertility rates by birth order (horizontal parallelograms
Last modified: 25/01/2013

Cohort	Age	CCFR	CCFR1	CCFR2	CCFR3	CCFR4	CCFR5p
1918	12	.	.	.	.	.	.
1918	13	.	.	.	.	.	.
1918	14	.	.	.	.	.	.
1918	15	0.000	0.000	0.000	0.000	0.000	0.000
1918	16	0.007	0.007	0.000	0.000	0.000	0.000
1918	17	0.027	0.025	0.002	0.000	0.000	0.000
1918	18	0.068	0.061	0.006	0.000	0.000	0.000
1918	19	0.137	0.115	0.019	0.002	0.000	0.000
1918	20	0.231	0.181	0.043	0.007	0.001	0.000
1918	21	0.344	0.250	0.075	0.016	0.003	0.001
1918	22	0.466	0.313	0.112	0.031	0.007	0.002
1918	23	0.598	0.376	0.152	0.050	0.015	0.005
1918	24	0.748	0.446	0.195	0.072	0.025	0.011
1918	25	0.914	0.514	0.246	0.097	0.037	0.019
1918	26	1.072	0.567	0.298	0.125	0.052	0.030
1918	27	1.206	0.605	0.341	0.150	0.066	0.044
1918	28	1.342	0.643	0.384	0.175	0.079	0.060
1918	29	1.494	0.685	0.433	0.202	0.094	0.079
1918	30	1.632	0.719	0.476	0.230	0.108	0.099
1918	31	1.757	0.743	0.514	0.257	0.123	0.121
1918	32	1.865	0.760	0.545	0.281	0.137	0.142
1918	33	1.968	0.773	0.571	0.306	0.152	0.166
1918	34	2.061	0.784	0.593	0.328	0.166	0.190
1918	35	2.145	0.793	0.610	0.348	0.180	0.215
1918	36	2.221	0.800	0.624	0.365	0.193	0.239
1918	37	2.286	0.805	0.634	0.379	0.205	0.263
1918	38	2.342	0.809	0.642	0.390	0.215	0.286
1918	39	2.391	0.813	0.648	0.399	0.223	0.308
1918	40	2.429	0.815	0.653	0.405	0.230	0.327
1918	41	2.457	0.816	0.656	0.410	0.234	0.341
1918	42	2.476	0.817	0.657	0.412	0.237	0.352
1918	43	2.490	0.818	0.658	0.414	0.239	0.361
1918	44	2.499	0.818	0.659	0.415	0.241	0.366
1918	45	2.504	0.818	0.659	0.416	0.241	0.369
1918	46	2.506	0.818	0.659	0.416	0.241	0.370
1918	47	2.507	0.819	0.660	0.416	0.242	0.371
1918	48	2.507	0.819	0.660	0.416	0.242	0.371
1918	49	2.507	0.819	0.660	0.416	0.242	0.372
1918	50	2.507	0.819	0.660	0.416	0.242	0.372
1918	51	2.507	0.819	0.660	0.416	0.242	0.372
1918	52	2.507	0.819	0.660	0.416	0.242	0.372
1918	53	2.507	0.819	0.660	0.416	0.242	0.372
1918	54	2.507	0.819	0.660	0.416	0.242	0.372
1918	55	2.507	0.819	0.660	0.416	0.242	0.372

6 Human Fertility Collection / HFC

Human Fertility Collection

The Human Fertility Collection (HFC) is a joint project of the Max Planck Institute for Demographic Research (MPIDR) in Germany and the Vienna Institute of Demography (VID) in Austria. The HFC has been designed to supplement the Human Fertility Database (HFD) and to incorporate a variety of international fertility data that are valuable for fertility research but do not meet all quality standards of the HFD.

The HFC features estimates from diverse, not necessarily official, data sources, including survey data and data reconstructions by individual researchers or research teams. Thus the HFC provides many alternative to official fertility indicators and is not limited to continuous time series. This flexibility allows to expand the geographical coverage of data to less developed parts of the world as well as to feature historical data and estimates. Due to variability in data origins and estimation methods used in the original data sources, the level of data comparability and reliability is sometimes lower than that of the HFD. Therefore, users must be cautious when using these data for their research.

At present, the HFC includes the following period fertility data specified for all the birth orders combined and by birth order (when available) provided in a standardized format: age-specific fertility rates, cumulative fertility rates, total fertility rates, and mean ages at birth. However, the process of data collection is not complete. More countries and additional fertility dimensions (region of residence, country of birth, marital status, sex, etc.) shall be added in the future. The database is being developed and updated on a rolling basis. Suggestions and submissions of new data to the HFC are very welcome.

MAX PLANCK INSTITUTE FOR DEMOGRAPHIC RESEARCH

Joint project of the MPIDR and the VID, based at the MPIDR

Vienna Institute of Demography OAW

Human Fertility Collection

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At present, data for **89 countries** are provided in the HFC. The HFC data can be downloaded either as a single zipped file for all countries or by country. Data for all birth orders combined and data by birth order are available for download separately. Please note that by downloading the HFC data you agree to be bound to *the terms of the user agreement*.

Zipped data files

Indicator	All birth orders combined	By birth order
ASFR and CPFR, standardized age scale	All HFC data (4.3Mb)	All HFC data (5.9Mb)
ASFR, original age scale	All HFC data (1.9Mb)	All HFC data (2.7Mb)
Total fertility rate and mean age at birth	All HFC data (99.6Kb)	All HFC data (116Kb)

References *Notes* *Codes used in HFC*

Data by country

Albania	Estonia	Luxembourg	Serbia and Montenegro
American Samoa	Faroe Island	Macedonia	Seychelles
Argentina	Finland	Malaysia	Singapore
Armenia	France	Malta	Slovakia
Aruba	Georgia	Mauritius	Slovenia
Australia	Germany	Micronesia	Spain
Austria	Germany, East	Moldova	Sri Lanka
Azerbaijan	Germany, West	Mongolia	Sweden
Bahamas	Greece	Montenegro	Switzerland
Bahrain	Greenland	Netherlands	Taiwan
Belarus	Hong Kong	New Zealand	Tunisia
Belgium	Hungary	Norway	Turkey
Bosnia and Herzegovina	Iceland	Pakistan	UK, England and Wales
Brazil	India	Palau	UK, Northern Ireland
Bulgaria	Ireland	Panama	UK, Scotland
Canada	Israel	Poland	Ukraine
Chile	Italy	Portugal	United Kingdom
Costa Rica	Japan	Qatar	Uruguay
Croatia	Kazakhstan	Republic of Korea	USA

Human Fertility Collection

UNITED STATES OF AMERICA

Pooled Data Files		
Indicator	**All birth orders combined**	**By birth order**
ASFR and CPFR, standardized age scale	1917-2013	1917-2006
Total fertility rate and mean age at birth	1917-2013	1917-2006

References *Notes*

Data by source		
Source	**All birth orders combined**	**By birth order**
European Demographic Observatory (ODE). Data collection submitted to the HFC by Jean-Paul Sardon, 2011.	1917-2006	1917-2006
Centers for Disease Control and Prevention (2005). *Vital Statistics of the United States, 2003, Volume I, Natality*. Hyattsville: National Center for Health Statistics. Data downloaded on 04.06.2013.	1940-2003	
Centers for Disease Control and Prevention (2011). Births: preliminary data for 2010. *National Vital Statistics Reports* 60(2): 1-20. Data downloaded on 04.06.2013.	2001-2010	
Centers for Disease Control and Prevention (2012). Births: preliminary data for 2011. *National Vital Statistics Reports* 61(5): 1-11. Data downloaded on 04.06.2013.	2011	
The Office of Population Research at Princeton University (2013). Age specific fertility rates by live birth order [electronic resource]. Data downloaded on 19.10.2013.	1917-1980	1917-1980
Centers for Disease Control and Prevention (2013). Births: final data for 2012. *National Vital Statistics Reports* 62(9). Data downloaded on 28.03.2014.	2012	
Centers for Disease Control and Prevention (2014). Births: preliminary data for 2013. *National Vital Statistics Reports* 63(2). Hyattsville, MD: National Center	2013	

HFC data format

http://www.fertilitydata.org/data/USA/USA_ASFRstand_TOT.txt

Country	Region	Residence	Ethnicity	Year1	Year2	Age	AgeInt	AgeDef	Vital	ASFR	CPFR	Collection	RefCode	Note	Split
USA	.	.	.	1917	1917	14	-99	ACY	1	0.00199	0.00000	ODE	USA_01	.	2
USA	.	.	.	1917	1917	15	1	ACY	1	0.01301	0.00199	ODE	USA_01	.	2
USA	.	.	.	1917	1917	16	1	ACY	1	0.02700	0.01500	ODE	USA_01	.	0
USA	.	.	.	1917	1917	17	1	ACY	1	0.05420	0.04200	ODE	USA_01	.	0
USA	.	.	.	1917	1917	18	1	ACY	1	0.08620	0.09620	ODE	USA_01	.	0
USA	.	.	.	1917	1917	19	1	ACY	1	0.12260	0.18240	ODE	USA_01	.	0
USA	.	.	.	1917	1917	20	1	ACY	1	0.14850	0.30500	ODE	USA_01	.	0
USA	.	.	.	1917	1917	21	1	ACY	1	0.16730	0.45350	ODE	USA_01	.	0
USA	.	.	.	1917	1917	22	1	ACY	1	0.17530	0.62080	ODE	USA_01	.	0
USA	.	.	.	1917	1917	23	1	ACY	1	0.18550	0.79610	ODE	USA_01	.	0
USA	.	.	.	1917	1917	24	1	ACY	1	0.18320	0.98160	ODE	USA_01	.	0
USA	.	.	.	1917	1917	25	1	ACY	1	0.18080	1.16480	ODE	USA_01	.	0
USA	.	.	.	1917	1917	26	1	ACY	1	0.17110	1.34560	ODE	USA_01	.	0
USA	.	.	.	1917	1917	27	1	ACY	1	0.17460	1.51670	ODE	USA_01	.	0
USA	.	.	.	1917	1917	28	1	ACY	1	0.17070	1.69130	ODE	USA_01	.	0
USA	.	.	.	1917	1917	29	1	ACY	1	0.16620	1.86200	ODE	USA_01	.	0
USA	.	.	.	1917	1917	30	1	ACY	1	0.14490	2.02820	ODE	USA_01	.	0
USA	.	.	.	1917	1917	31	1	ACY	1	0.13450	2.17310	ODE	USA_01	.	0
USA	.	.	.	1917	1917	32	1	ACY	1	0.12230	2.30760	ODE	USA_01	.	0
USA	.	.	.	1917	1917	33	1	ACY	1	0.12100	2.42990	ODE	USA_01	.	0
USA	.	.	.	1917	1917	34	1	ACY	1	0.11470	2.55090	ODE	USA_01	.	0
USA	.	.	.	1917	1917	35	1	ACY	1	0.10960	2.66560	ODE	USA_01	.	0
USA	.	.	.	1917	1917	36	1	ACY	1	0.10130	2.77520	ODE	USA_01	.	0
USA	.	.	.	1917	1917	37	1	ACY	1	0.09530	2.87650	ODE	USA_01	.	0
USA	.	.	.	1917	1917	38	1	ACY	1	0.08430	2.97180	ODE	USA_01	.	0
USA	.	.	.	1917	1917	39	1	ACY	1	0.07510	3.05610	ODE	USA_01	.	0
USA	.	.	.	1917	1917	40	1	ACY	1	0.05580	3.13120	ODE	USA_01	.	0
USA	.	.	.	1917	1917	41	1	ACY	1	0.04420	3.18700	ODE	USA_01	.	0
USA	.	.	.	1917	1917	42	1	ACY	1	0.03220	3.23120	ODE	USA_01	.	0
USA	.	.	.	1917	1917	43	1	ACY	1	0.02540	3.26340	ODE	USA_01	.	0
USA	.	.	.	1917	1917	44	1	ACY	1	0.01780	3.28880	ODE	USA_01	.	0
USA	.	.	.	1917	1917	45	1	ACY	1	0.01170	3.30660	ODE	USA_01	.	0
USA	.	.	.	1917	1917	46	1	ACY	1	0.00750	3.31830	ODE	USA_01	.	0
USA	.	.	.	1917	1917	47	1	ACY	1	0.00410	3.32580	ODE	USA_01	.	0
USA	.	.	.	1917	1917	48	1	ACY	1	0.00230	3.32990	ODE	USA_01	.	0
USA	.	.	.	1917	1917	49	1	ACY	1	0.00081	3.33220	ODE	USA_01	.	2
USA	.	.	.	1917	1917	50	99	ACY	1	0.00028	3.33301	ODE	USA_01	.	2
USA	.	.	.	1918	1918	14	-99	ACY	1	0.00201	0.00000	ODE	USA_01	.	2
USA	.	.	.	1918	1918	15	1	ACY	1	0.01299	0.00201	ODE	USA_01	.	2
USA	.	.	.	1918	1918	16	1	ACY	1	0.02650	0.01500	ODE	USA_01	.	0
USA	.	.	.	1918	1918	17	1	ACY	1	0.05240	0.04150	ODE	USA_01	.	0
USA	.	.	.	1918	1918	18	1	ACY	1	0.08400	0.09390	ODE	USA_01	.	0
USA	.	.	.	1918	1918	19	1	ACY	1	0.12110	0.17790	ODE	USA_01	.	0
USA	.	.	.	1918	1918	20	1	ACY	1	0.14820	0.29900	ODE	USA_01	.	0
USA	.	.	.	1918	1918	21	1	ACY	1	0.16710	0.44720	ODE	USA_01	.	0
USA	.	.	.	1918	1918	22	1	ACY	1	0.17450	0.61430	ODE	USA_01	.	0
USA	.	.	.	1918	1918	23	1	ACY	1	0.18420	0.78880	ODE	USA_01	.	0
USA	.	.	.	1918	1918	24	1	ACY	1	0.18160	0.97300	ODE	USA_01	.	0
USA	.	.	.	1918	1918	25	1	ACY	1	0.17870	1.15460	ODE	USA_01	.	0
USA	.	.	.	1918	1918	26	1	ACY	1	0.17020	1.33330	ODE	USA_01	.	0

References

Human Fertility Collection

References by reference code, United States of America

References by source...

Reference code	Reference
USA_01	European Demographic Observatory (ODE). Data collection submitted to the HFC by Jean-Paul Sardon, 2011.
USA_02	Centers for Disease Control and Prevention (2005). *Vital Statistics of the United States, 2003, Volume I, Natality*. Hyattsville: National Center for Health Statistics. Data downloaded on 04.06.2013. [Original URL]
USA_03	Centers for Disease Control and Prevention (2011). Births: preliminary data for 2010. *National Vital Statistics Reports* 60(2): 1-20. Data downloaded on 04.06.2013. [Original URL]
USA_04	Centers for Disease Control and Prevention (2012). Births: preliminary data for 2011. *National Vital Statistics Reports* 61(5): 1-11. Data downloaded on 04.06.2013. [Original URL]
USA_05	The Office of Population Research at Princeton University (2013). Age specific fertility rates by live birth order [electronic resource]. Data downloaded on 19.10.2013. [Original URL]
USA_06	Centers for Disease Control and Prevention (2013). Births: final data for 2012. *National Vital Statistics Reports* 62(9). Data downloaded on 28.03.2014. [Original URL]
USA_07	Centers for Disease Control and Prevention (2014). Births: preliminary data for 2013. *National Vital Statistics Reports* 63(2). Hyattsville, MD: National Center for Health Statistics. Data downloaded on 30.07.2014. [Original URL]

HFC Collections

Human Fertility Collection

Collections

Code	ODE
Title	European Demographic Observatory (L'Observatoire Démographique Européen)
Description	Fertility data from the database of the European Demographic Observatory (commonly called the ODE collection: L'Observatoire Démographique Européen) comprise a significant contribution to the HFC. The ODE collection was kindly given to the MPIDR by ODE co-founder Jean-Paul Sardon for use in the Human Fertility Collection and the Human Fertility Database. It is an extensive collection of demographic data for a number of European and non-European countries that was assembled and continuously updated over many years through the late 2000s. At present, the HFC features one type of data from the ODE collection: smoothed period age-specific fertility rates for all the birth orders combined and by birth order. See full description for details...

Code	STAT
Title	Official statistical data
Description	Data that come from statistical publications and official websites of national statistical offices

Code	RE
Title	Research estimates
Description	Alternative, not official, fertility estimates published or directly submitted to the HFC by individual researchers, research teams, or research organizations

EMPIRICAL ILLUSTRATIONS

7 Empirical illustrations: Fertility tables

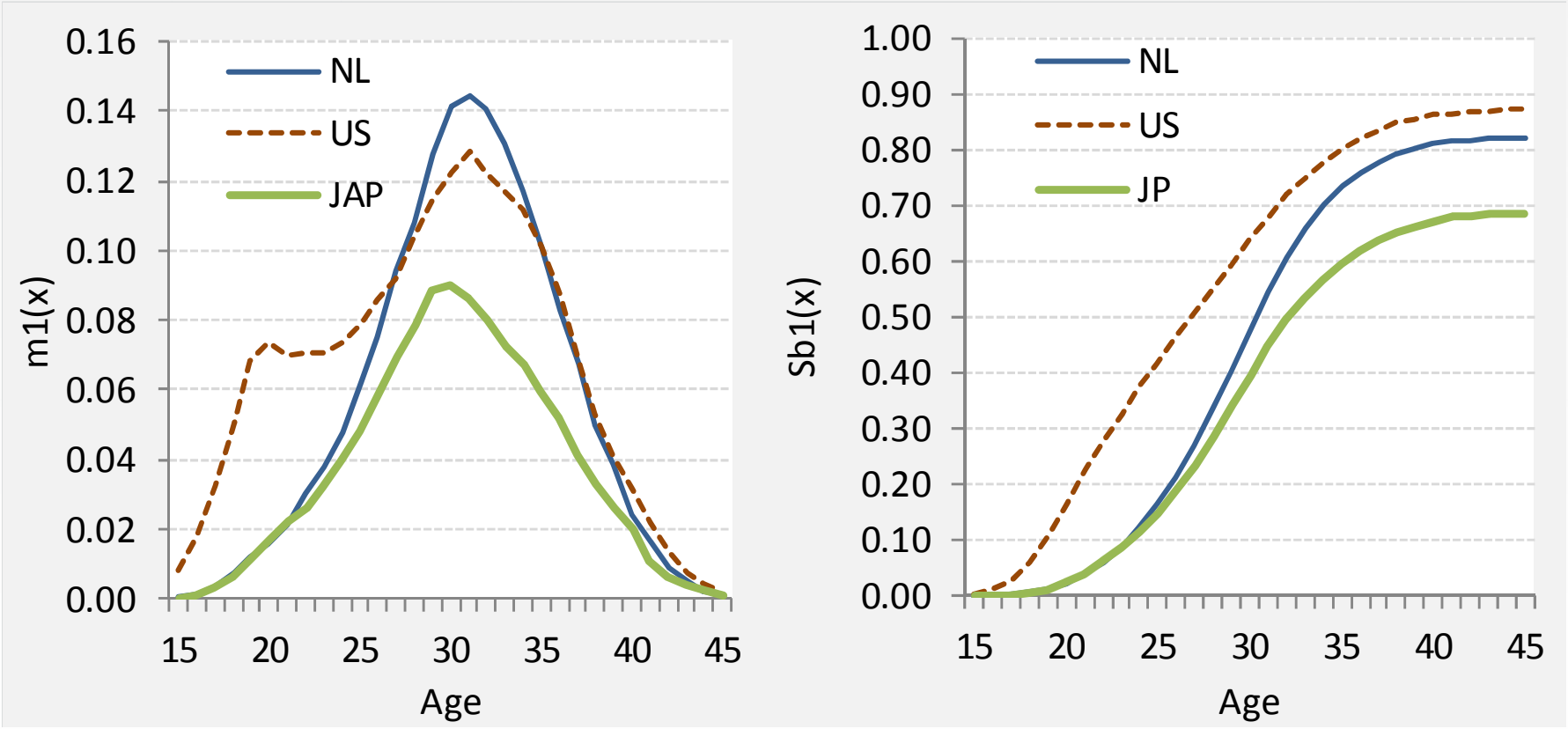
These illustrations based on paper in progress:

“Fertility tables in the Human Fertility Database: Construction and illustrations”

Tomáš Sobotka, Aiva Jasilioniene, Evgeny M. Andreev, Dmitri A. Jdanov, Kryštof Zeman, Vladimir M. Shkolnikov, and Joshua R. Goldstein

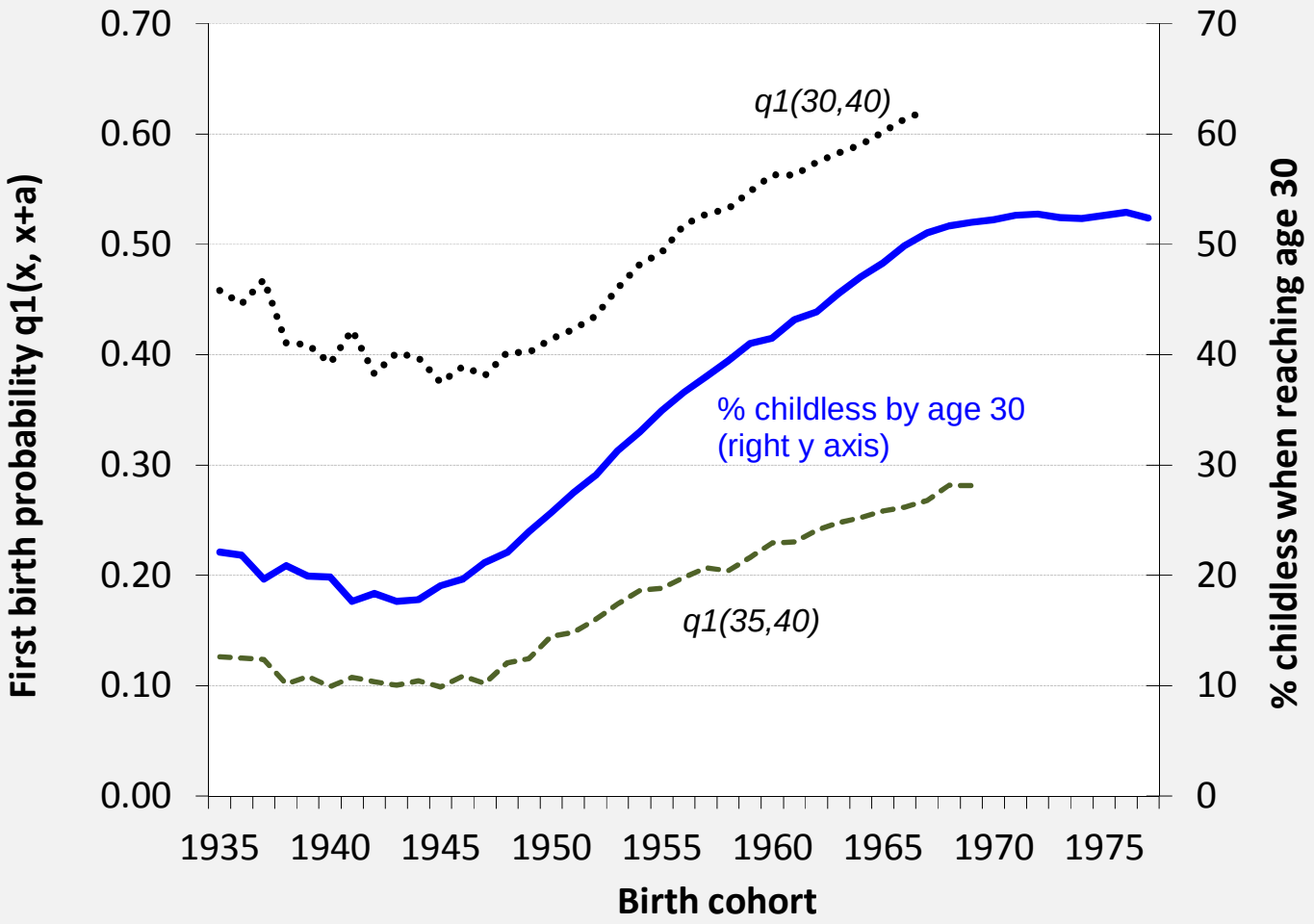
First births in the US, Netherlands and Japan

Parity-specific first birth rates by age ($m_1(x)$,left panel) and cumulative probability of having a first birth $sb_1(x)$ by a given age x in 2008, right panel



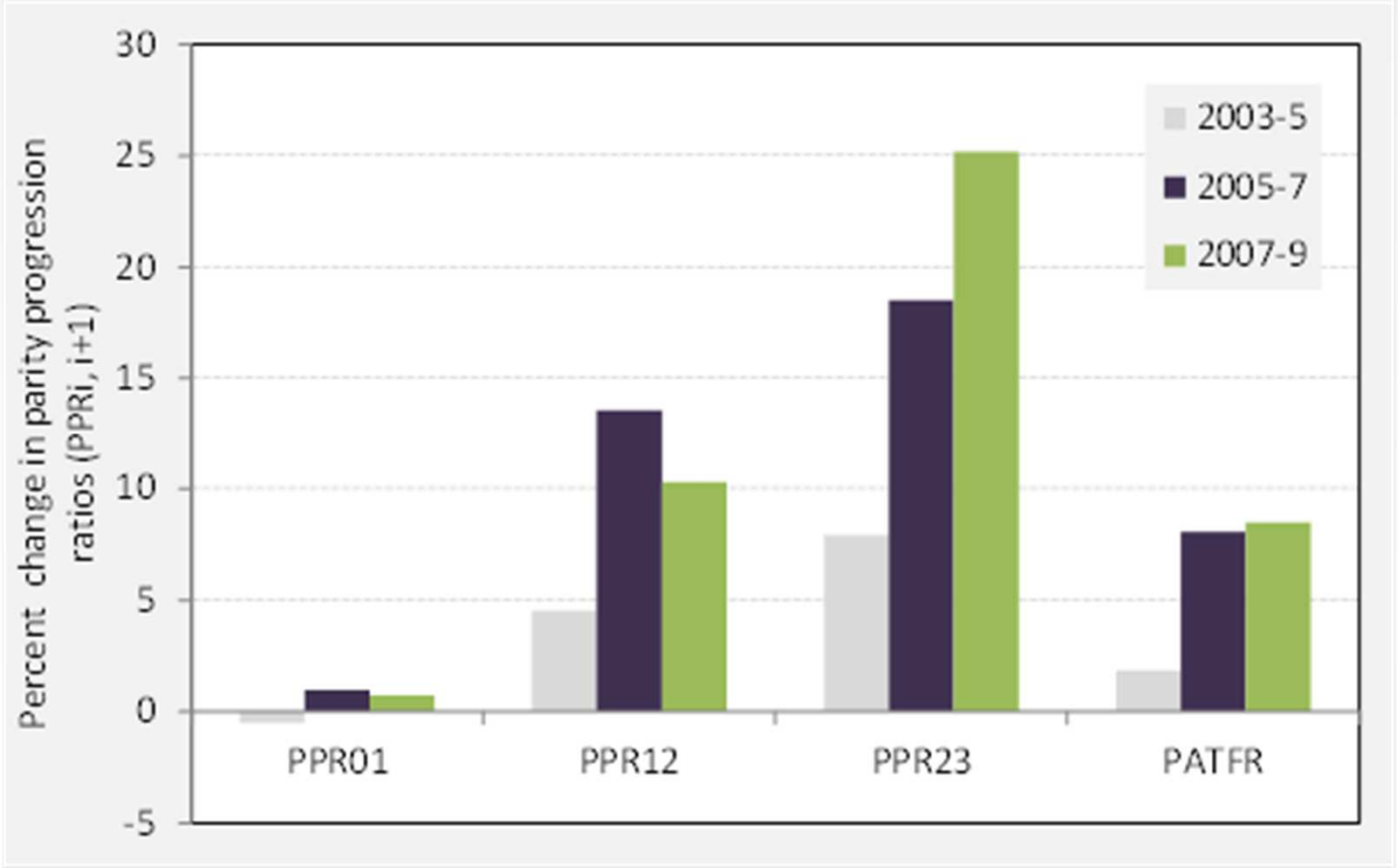
First birth postponement & "recuperation" in the Netherlands

Association between childlessness at age 30 and the conditional probability of having a first child at ages 30 to 40 and 35 to 40, women born 1935-77



Maternity benefits and parity-specific fertility changes in Ukraine, 2003-9

Parity-specific changes in fertility in Ukraine: link between expanding maternity benefits and table-based period parity progression ratios (PPRi,i+1)

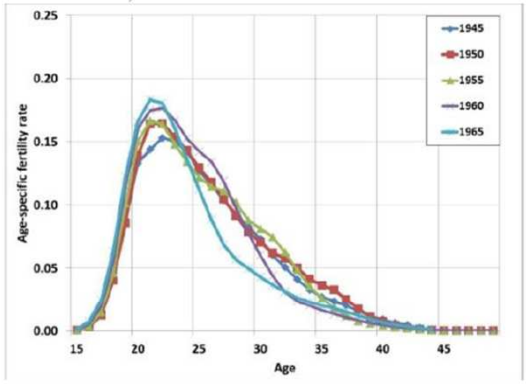


8 Illustrations: Topics in fertility research

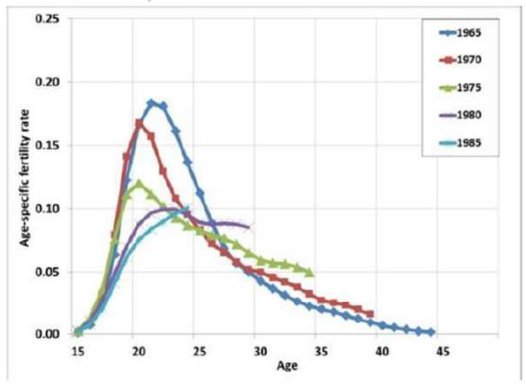
Comparative cross-country studies (1)

FIGURE 5 Cohort age-specific fertility rates, Russian Federation, Bulgaria, Czech Republic, Netherlands, Spain and Austria, birth cohorts 1945, 1950, 1955, 1960, 1965, 1970, 1975, 1980 and 1985
[2 pages]

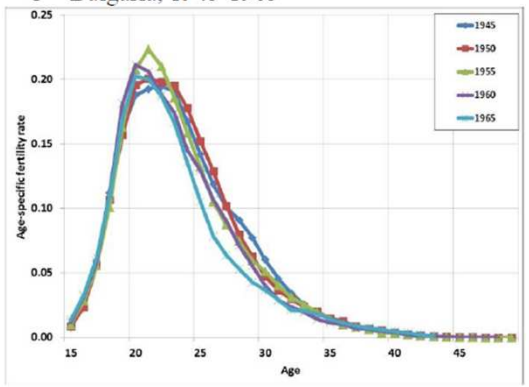
A - Russia, 1945-1965



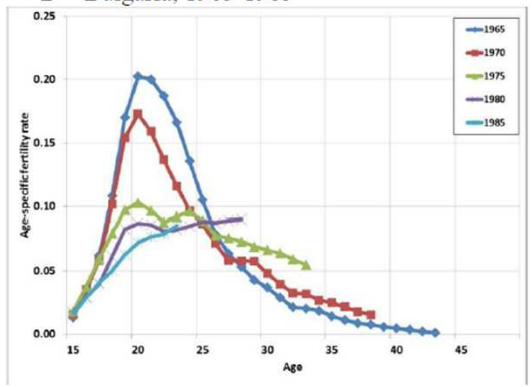
B - Russia, 1965-1985



C – Bulgaria, 1945-1965



D – Bulgaria, 1965-1985



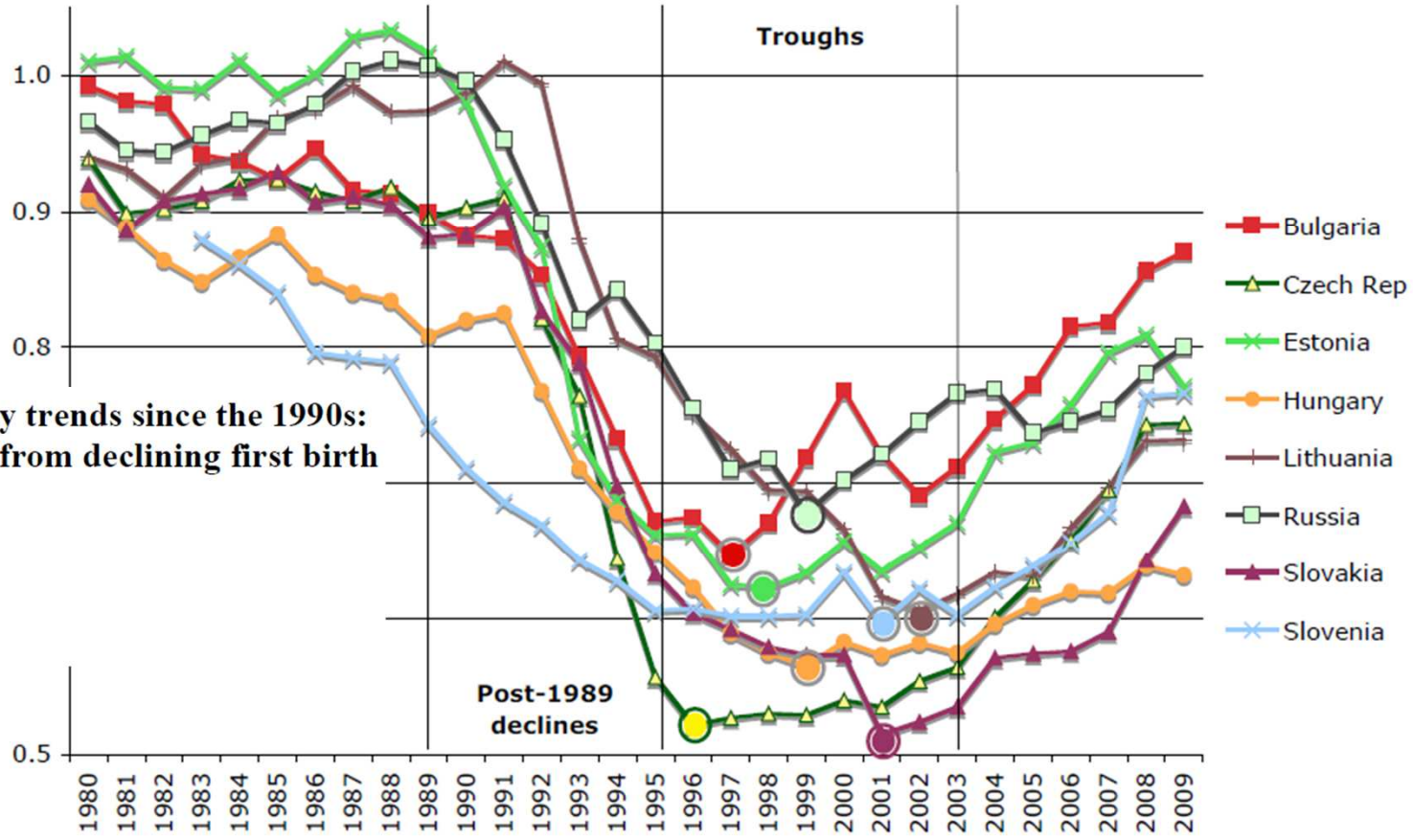
Source:
Frejka, Basten et al. 2015

Fertility and Family Policies in Central and Eastern Europe

Co-ordinating authors: Stuart Basten (University of Oxford), Tomas Frejka (University of Oxford)

Comparative cross-country studies (2)

Figure 2c: Trends in TFR1 1980–2009: Eastern European countries



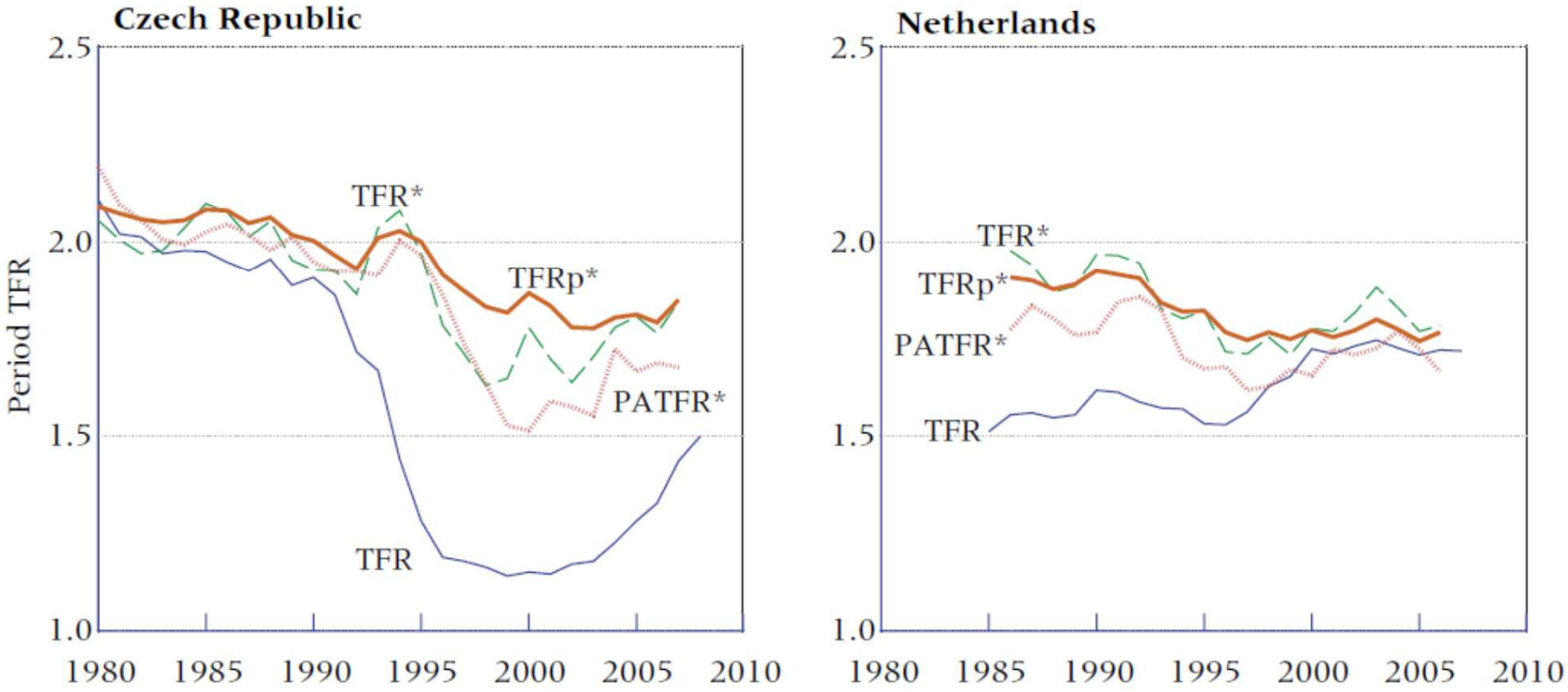
Europe-wide fertility trends since the 1990s: Turning the corner from declining first birth rates

Marion Burkimsher

Source:
Burkimsher 2015,
Demographic Research

Developing new indicators

FIGURE 10 Observed and tempo-adjusted total fertility indexes for all birth orders



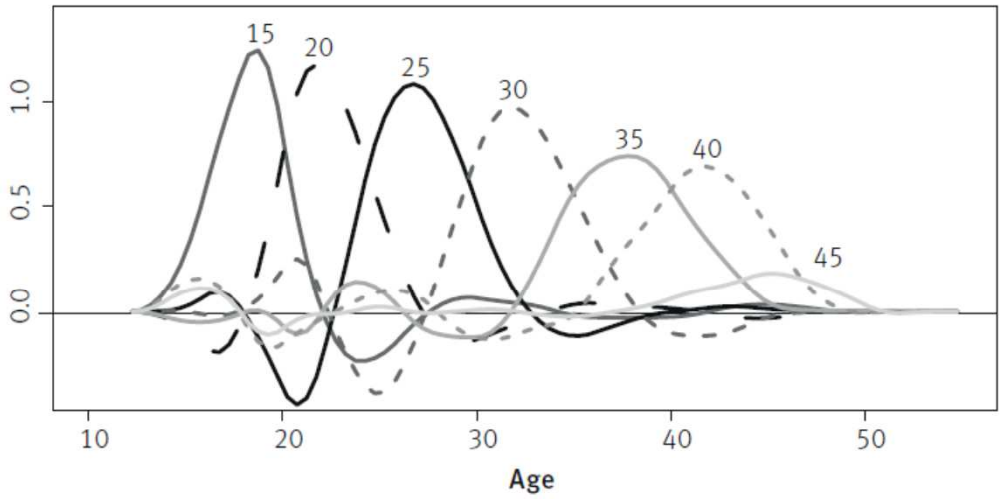
Source:
Bongaarts & Sobotka 2015,
Population and Development Review

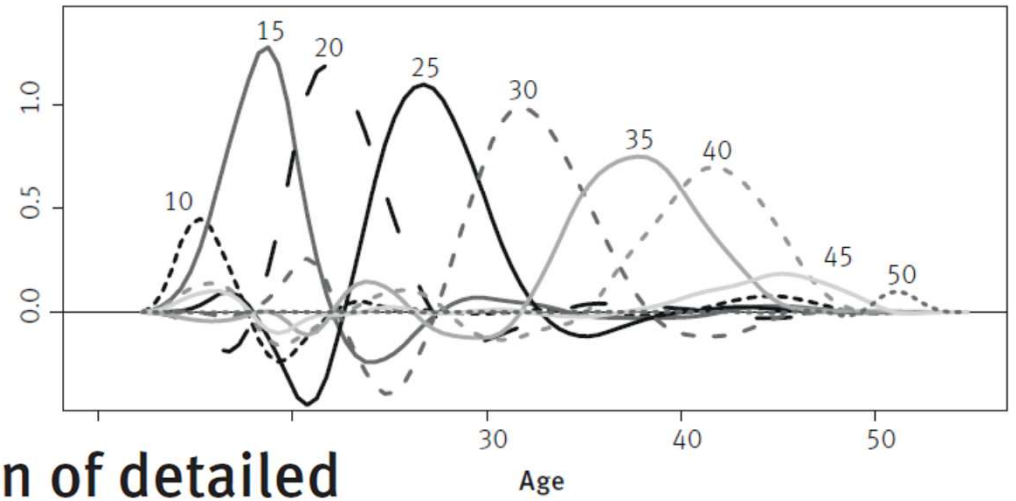
A Demographic Explanation for the Recent Rise in European Fertility

JOHN BONGAARTS
TOMÁŠ SOBOTKA

Developing new methodology (1)

GRAPH 1
Empirical basis functions for a fitted schedule at half-year intervals over [12,55





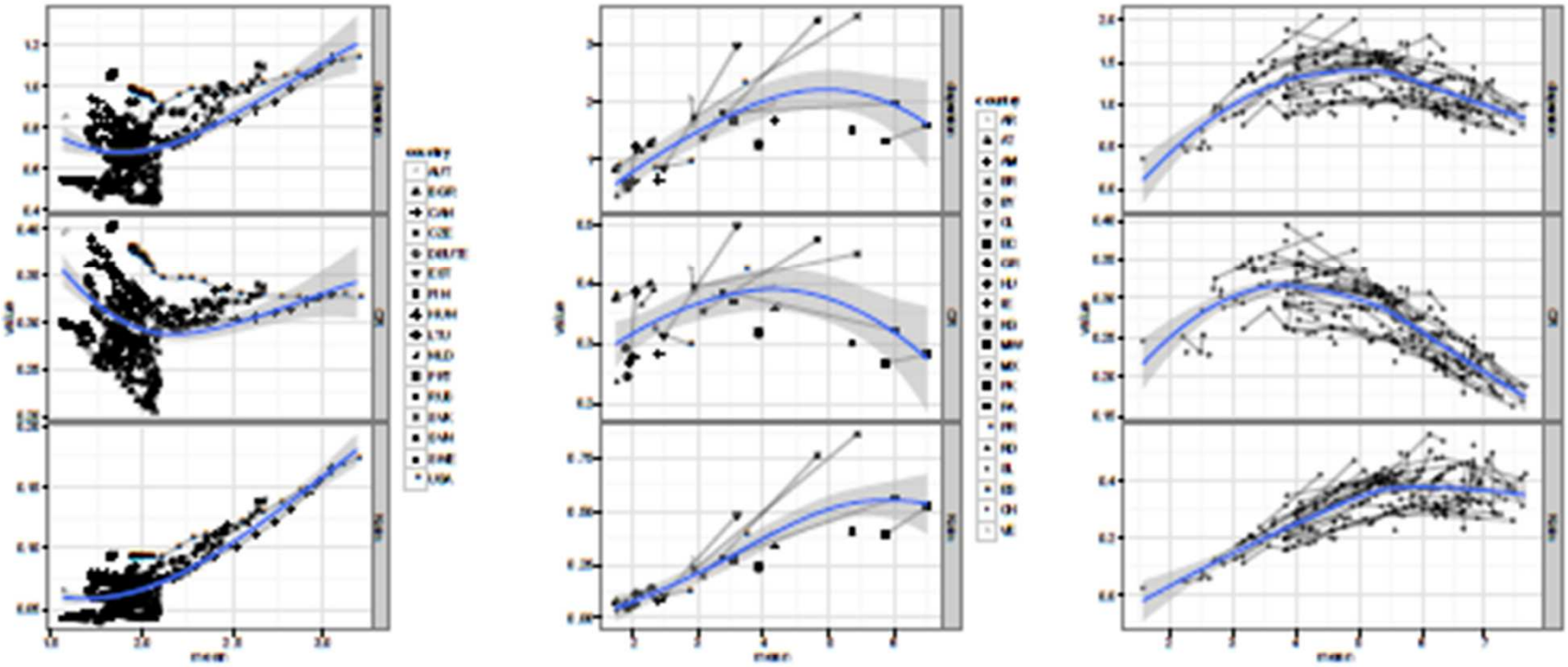
Source:
Schmertmann 2014
Rev. bras. Est. Pop.

http://schmert.net/calibrated-spline/REBEP/

Calibrated spline estimation of detailed fertility schedules from abridged data*

nities

Developing new methodology (2)



(a) HFD (b) IPUMS (c) DHS

Figure 4: Concentration by mean completed parity. Solid line: weighted regression smoother. Data: as labelled, women aged 40–44

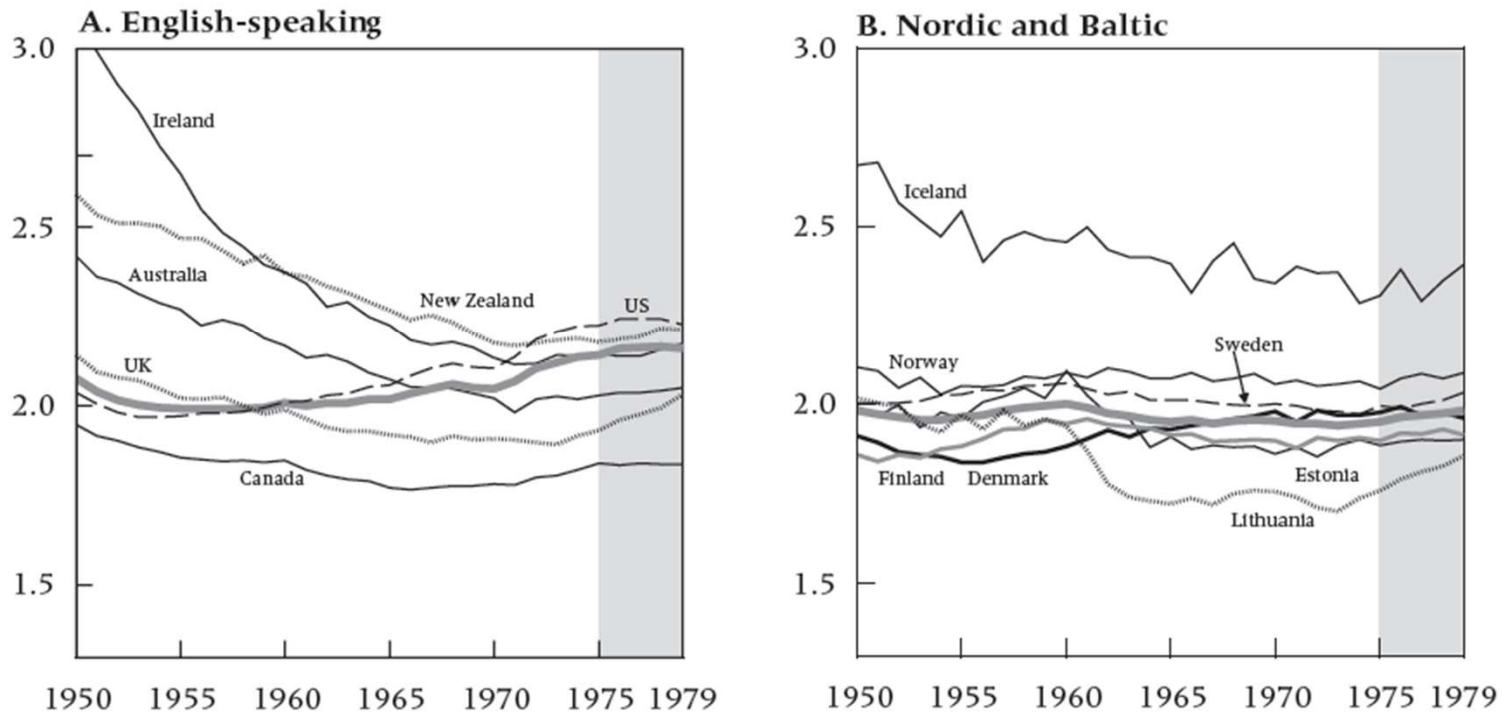
Bilal Barakat

Source:
Barakat 2014
VID WP 2014-1

Revisiting the History of Fertility Concentration and its Measurement

Projecting cohort fertility

FIGURE 1 Completed fertility, 1950–79 cohorts



Source:
Myrskyla, Goldstein & Cheng 2013
Population and Development Review

New Cohort Fertility Forecasts for the Developed World: Rises, Falls, and Reversals

MIKKO MYRSKYLÄ
JOSHUA R. GOLDSTEIN
YEN-HSIN ALICE CHENG

9 Using HFD efficiently (3 tips)

1: Downloading zipped files

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Vienna Institute of Demography
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1st HFD Symposium
Technical Reports
HFD Publications

The Human Fertility Database

Directors: Vladimir M. Shkolnikov (MPIDR) and Tomas Sobotka (VID)

The Human Fertility Database (HFD) is a joint project of the Max Planck Institute for Demographic Research (MPIDR) in Rostock, Germany and the Vienna Institute of Demography (VID) in Vienna, Austria, based at MPIDR. We seek to provide free and user-friendly access to detailed and high-quality data on period and cohort fertility and thus to facilitate research on changes and inter-country differences in fertility in the past and in the modern era. The HFD is entirely based on official vital statistics and places a great emphasis on data checking and documentation and on warranting data comparability across time and countries by means of uniform methodology. Read more

The MPIDR and the VID also collaborate on the Human Fertility Collection (www.fertilitydata.org), which is supplementing the HFD. The HFC incorporates a variety of valuable fertility data from diverse, not necessarily official, data sources. The major responsibility for the quality of data entering the HFC rests with data producers/providers. Therefore, HFC data, unlike those in the HFD, might be of lower quality.

For users who seek fast access to the most commonly used summary indicators of period and cohort fertility, we provide excel tables comprising the following indicators for all the HFD countries:

HFD summary indicators				
Total fertility rate	Mean age at birth	Mean age at first birth	Completed cohort fertility	Cohort childlessness

We seek to provide open, international access to these data. At present, the database contains detailed period and cohort fertility data for the following countries:

Detailed data by country				
Austria	Estonia	Japan	Slovakia	U.S.A.
Belarus	Finland	Lithuania	Slovenia	Ukraine
Bulgaria	France	Netherlands	Sweden	
Canada	⊞Germany	Norway	Switzerland	
Chile	Hungary	Portugal	Taiwan	
Czech Republic	Iceland	Russia	⊞U.K.	

The HFD will be continually updated and more countries will be added with time. Below we present countries which are on our "coming next" list. For these countries we provide only age-specific fertility rates based on the original official data. Please be aware that these data have not been fully processed, checked, and corrected and may not be free of mistakes and biases.

Preliminary release				
Ireland	Spain			

For more information, please begin by reading an overview of the database. If you have comments or questions, or trouble gaining access to the data, please contact us.

MAX PLANCK INSTITUTE FOR DEMOGRAPHIC RESEARCH

Joint project of the MPIDR and the VID, based at the MPIDR

Vienna Institute of Demography ÖAW

The whole HFD in one file

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The Human Fertility Database

Downloading the HFD in zipped data files

The Human Fertility Database has also been organized into zipped data files. This should facilitate rapid downloads of large amounts of HFD output data. Two series of these files are offered for different purposes.

For users who only want information of a given data type (e.g., birth counts) for all countries, zipped files "By data type" are recommended. Countries are presented here using standardized international country codes maintained by the International Organization for Standardization.

For users who want to obtain all available data for an individual country or for all countries, zipped data files labeled "By country" are recommended.

The file organization follows their internal organization in the HFD, and all publicly-available HFD data files are included in this set.

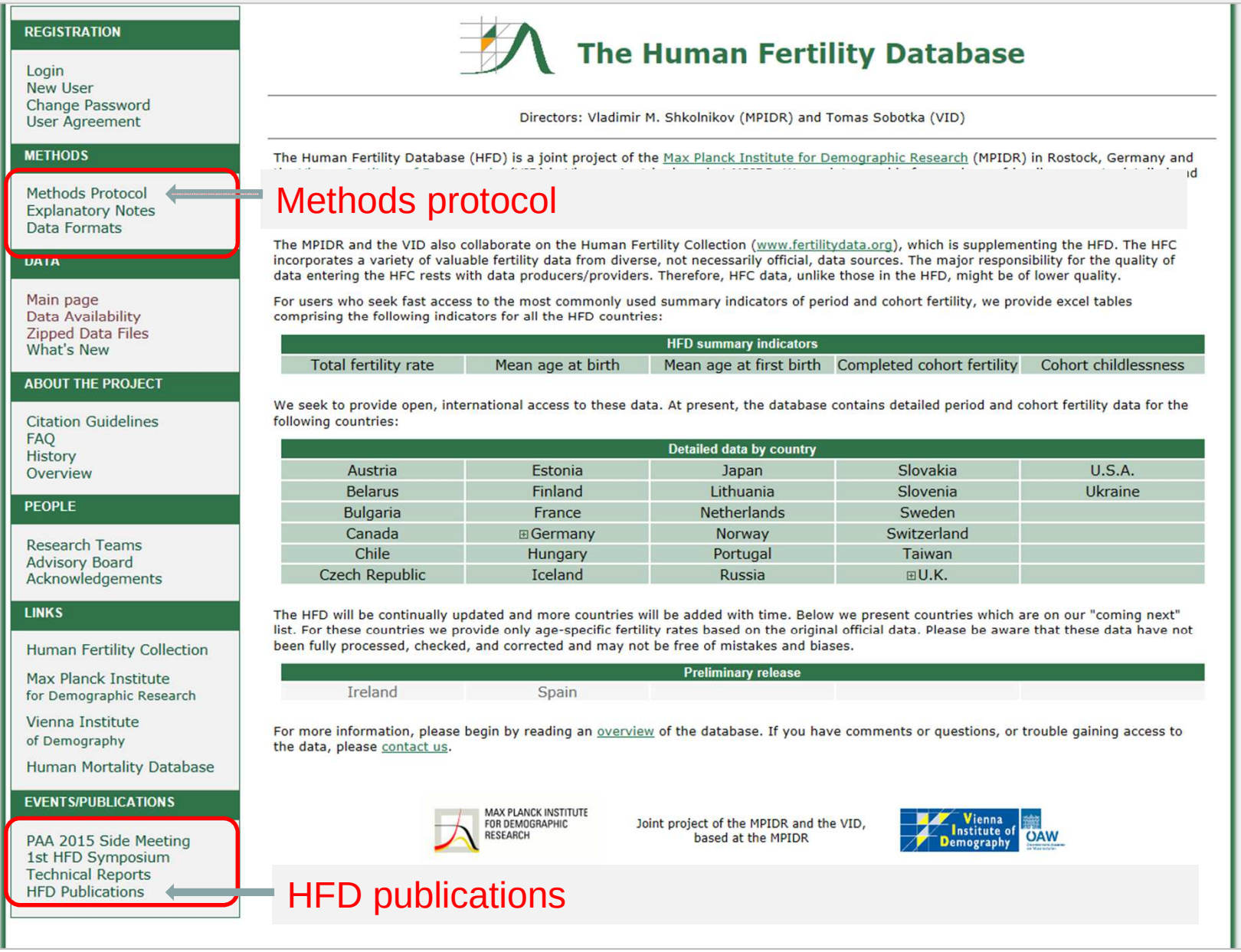
Data by type

Data type	Link to zip file
Births	births (7802Kb)
Female exposure	exposure (3250Kb)
Age-specific fertility rate	asfr (6084Kb)
Tempo-adjusted TFR	adjtfr (22Kb)
Mean age at birth	mab (63Kb)
Total fertility rate	tfr (63Kb)
Cumulative fertility rates	cfr (2604Kb)
Parity progression ratios	ppr (5Kb)
Fertility tables	ftables (3928Kb)
Population exposure by parity	parityexp (852Kb)
Conditional age-specific fertility rates	casfr (482Kb)
Table mean age at birth	pmab (14Kb)
Parity- and age-adjusted TFR (PATFR)	patfr (14Kb)
Crude birth rate	cbr (26Kb)
Standard deviation in mean age at birth	sdmab (55Kb)
All types of HFD data	HFD (25248Kb)

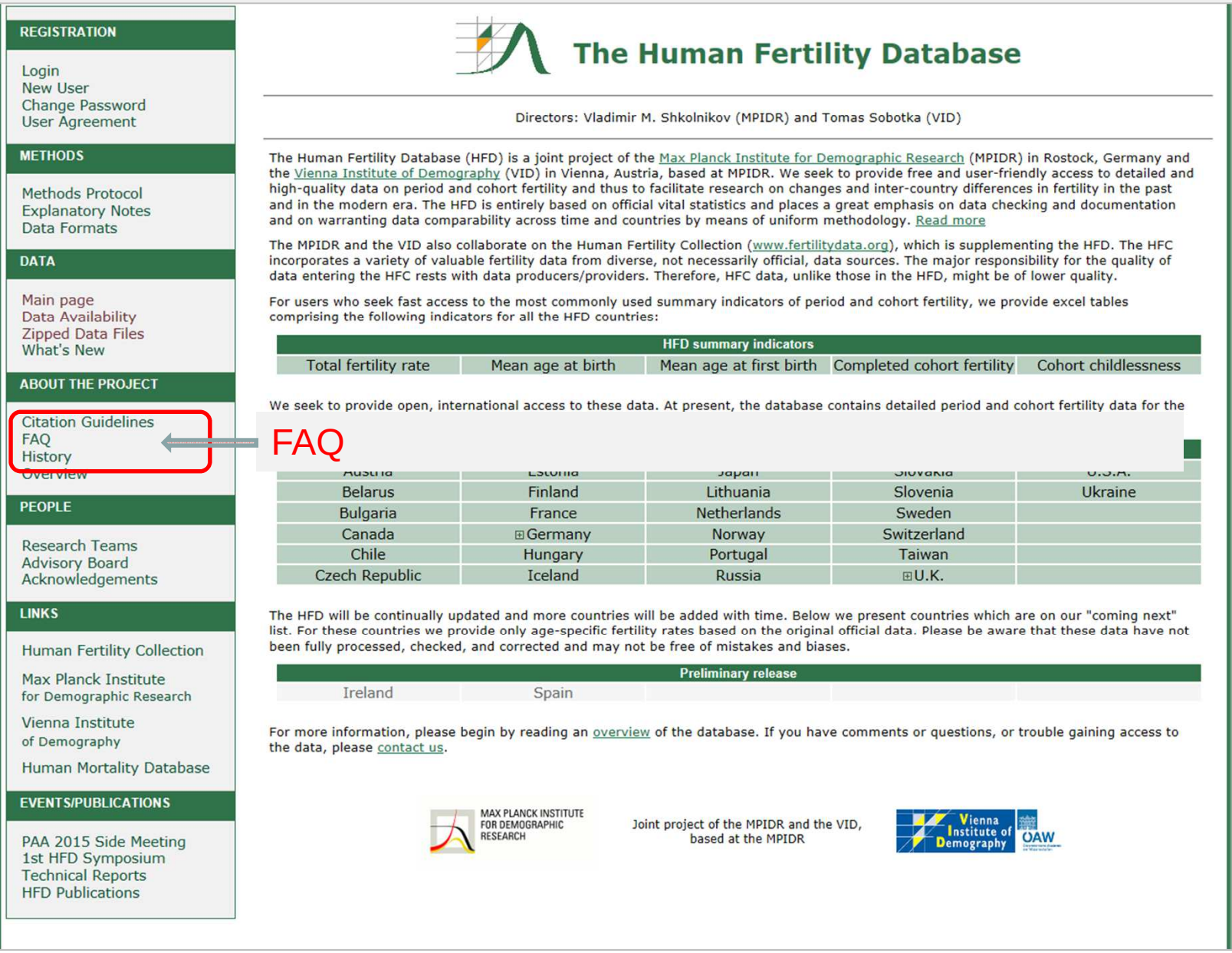
Data by country

Country	Link to zip file
Austria	AUT (648Kb)
Belarus	BLR (907Kb)
Bulgaria	BGR (1134Kb)
Canada	CAN (1466Kb)
Chile	CHL (268Kb)
Czech Republic	CZE (1317Kb)
Estonia	EST (956Kb)
Finland	FIN (839Kb)
France	FRATNP (339Kb)
Germany	DEUTNP (364Kb)
Germany, West	DEUTW (361Kb)

2: Consulting available HFD resources

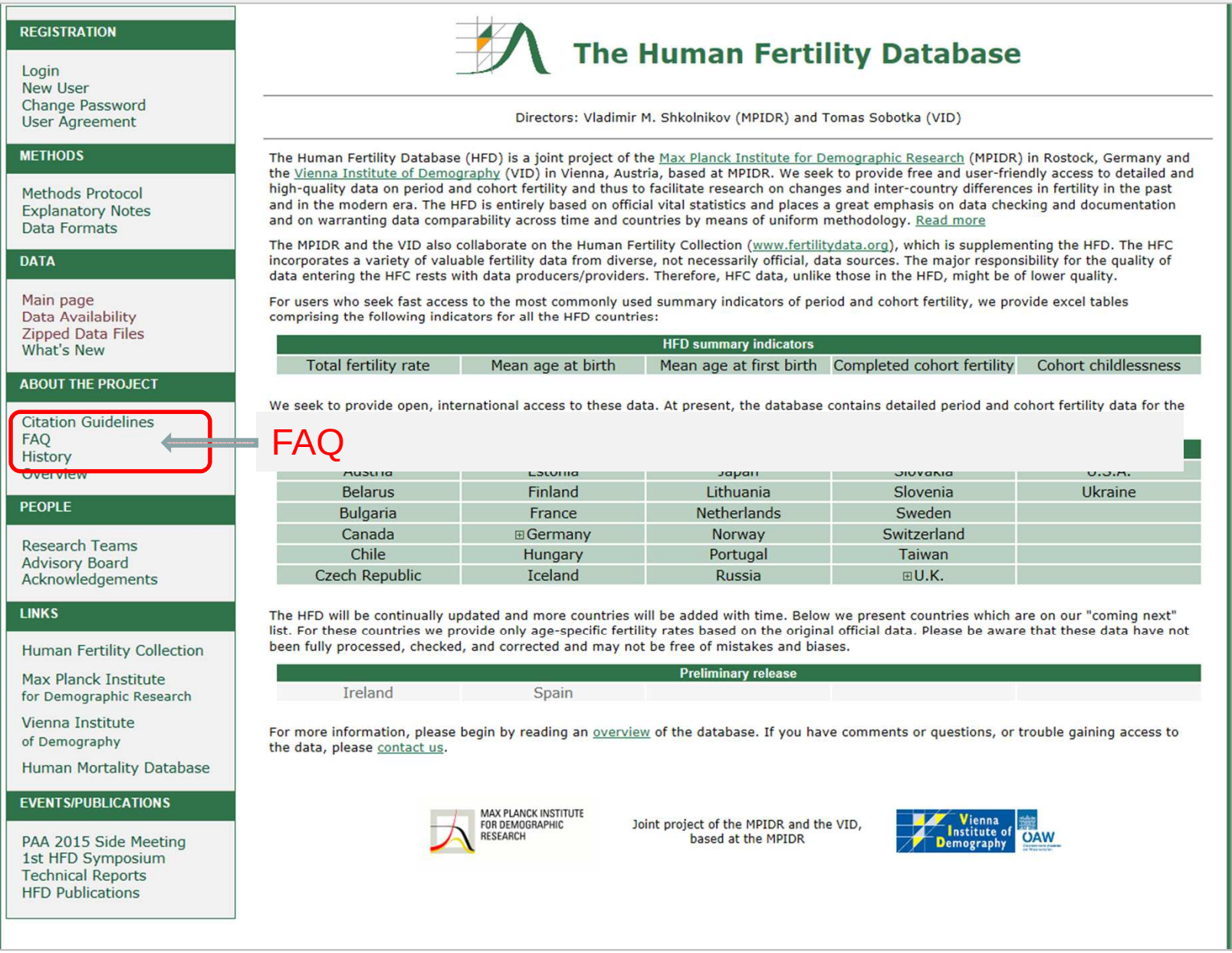


3: Consulting FAQ section



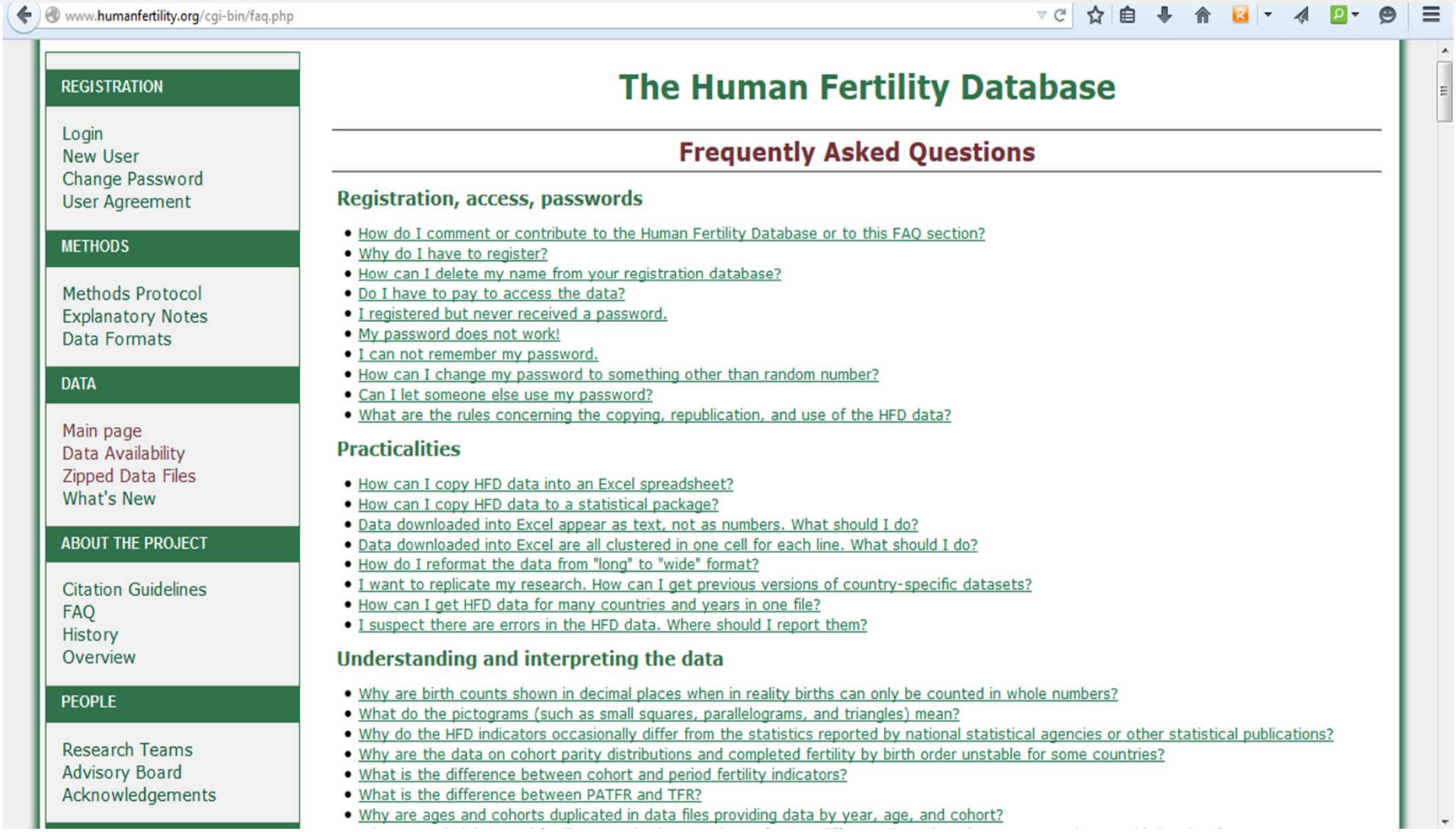
FAQ

3: Consulting FAQ section



FAQ

3: Consulting FAQ section



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