CREST
CENTER FOR RESEARCH
IN ECONOMICS AND STATISTICS

WORKING PAPER SERIES

CHILDLESSNESS AND THE MARIAGE MARKET

Pauline Rossi

N°7/July 2026

CREST
Center for Research in Economics and Statistics
UMR 9194

5 Avenue Henry Le Chatelier
TSA 96642
91764 Palaiseau Cedex
FRANCE

Phone: +33 (0)1 70 26 67 00
Email: info@crest.science
https://crest.science/

Childlessness and the marriage market

Pauline Rossi (CREST - Ecole Polytechnique)*

July 7, 2026

Invited article for the 80th anniversary issue of *Population*

Abstract

Long overlooked, childlessness is set to become a crucial topic in demography. It is linked to heated debates about ultra-low fertility among women and involuntary celibacy among men. In this article, I present key facts on female and male childlessness using large-scale surveys in 117 countries. The proportion of men who never have children is higher than that of women in most contexts. To understand why, I explore the role of general equilibrium effects on the marriage market: can a man be involuntarily childless due to a relative shortage of female partners? I summarize the results of three projects examining skewed sex ratios in Asia, polygamy in Africa and serial monogamy (divorce and remarriage) in Europe. I conclude that market features are quantitatively important drivers of gender gaps in childlessness, supporting the premise that the marriage market shapes reproductive inequalities in ways that deserve more exploration.

Keywords: Fertility, Childlessness, Marriage Market, Sex ratio, Polygamy, Divorce

*This research was funded by the European Union (ERC project P3OPLE). Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Research Council. Neither the European Union nor the granting authority can be held responsible for them. I am grateful to Zeynep Doga Bulamac for excellent research assistance. The replication package is available at: https://doi.org/10.3886/E250195V1

Fertility studies tend to focus on the average number of children per woman. This is important to predict population growth, but not enough to speak to two questions likely to shape the field of demography in the coming years: how low will fertility drop and who will have children? To answer these questions, we have to study the extensive margin of fertility – childlessness.

On the one hand, the global decline of birth rates has recently renewed the public interest in fertility. In a majority of countries, the average number of children per woman has fallen below the replacement level, triggering debates about the causes of ultra-low fertility. Are low birth rates driven by a high fraction of women who do not have children or by a low number of children among those who do have children? The answer is both, but with different weights in different countries. Figure 1 plots the share of childless women against the average number of children per woman across countries. While high average fertility rates are systematically associated with low childlessness rates, average rates below the replacement level can coexist with a share of childless women as low as 5% or as high as 30% depending on the country. Understanding this heterogeneity is important because what causes childlessness to be high might be quite different from what causes sibship size to be small. Having children or not, and how many to have conditional on having some, are not determined by the exact same factors. This implies that pro-natalist policies effective in one country might be ineffective somewhere else because they target a margin which is irrelevant in the other context.[1]

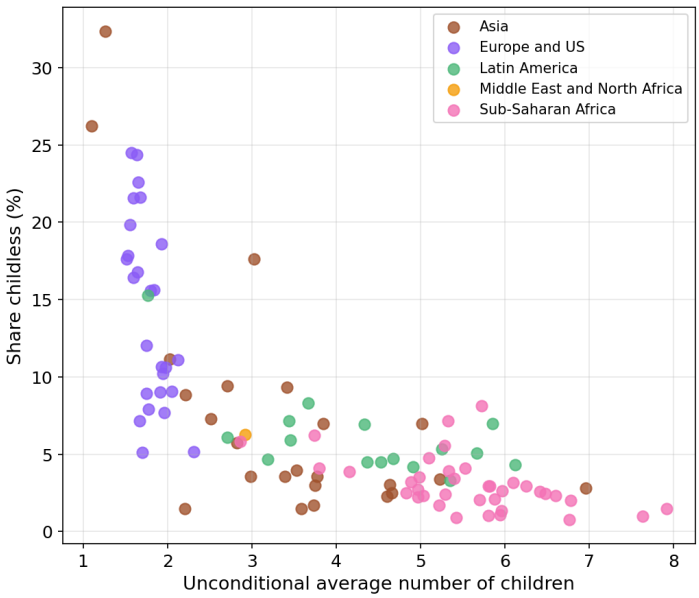


Figure 1: Childlessness *versus* average number of children

Notes: The figure plots the average number of children per woman on the x-axis and the share of childless women on the y-axis. Each dot is a country and the color indicates the world region. The sample consists of women aged 40 to 49 in the most recent survey available. See section 1 for details about the data. Source: Table A1.

On the other hand, a new topic has started to attract attention: single men known as "bare branches" in Asia and "incels" (involuntary celibates) in the Western world. There is a rapidly growing concern that men's inability to form a family could provoke mental health disorders and social unrest (Case & Deaton, 2017; Hudson & Den Boer, 2002). A major challenge in studying male childlessness is the paucity of consolidated data on male fertility.[2] Social scientists usually analyze fertility data at the woman level, because they implicitly assume that men and women are two sides of the same coin. However, this is only true if marriage is monogamous, stable and universal, which is not the case in

[1] In the aggregate, across high-income countries, Geruso and Spears (2025) estimate that close to 40% of the change in average completed cohort fertility is due to increased childlessness and the remaining 60% is due to declining number of children among mothers.

[2] An exception is Schoumaker (2019). The author computes the male age-specific fertility rates across the world circa 2010 and shows that they differ from female ones. These rates are obtained by dividing the numbers of births over a one-year period by the number of men, for each age group. They are informative about the mean, but not about other moments of the distribution such as the share of childless men.

most contexts as we will see. As a result, simple questions regarding the levels, trends and correlates of male childlessness across the world are hard to answer.

In the first part of this article, I produce a systematic analysis of female and male childlessness using data on individuals aged 40 to 49 in 117 countries. I establish three important facts. In most countries, (i) the fraction of childless men is systematically higher than the fraction of childless women, (ii) childlessness has increased more for men than for women, and (iii) the correlation between childlessness and socio-economic status is negative among men and positive among women. The levels, trends and/or correlates of female and/or male childlessness have been documented in a variety of case studies (for more details, see references in Skirbekk (2022) in the chapter on childlessness in the twenty-first century). My goal here is to provide a unified analysis drawing from several series of large-scale surveys in a substantial number of countries covering all world regions and all levels of economic development. The consolidated dataset is available in Rossi (2026) and reproduced in Table A1.

How to explain these facts? The literature on the causes of childlessness usually distinguishes between voluntary childlessness (individuals choosing to remain "childfree") and involuntary childlessness driven by biological infertility. More recently, the concept of "circumstantial" childlessness has been forged to account for the fact that a sizable share of individuals end up childless without explicitly intending to do so and without being hindered by health problems. One of the key circumstances is the inability to find the right partner at the right time. This inability is not only driven by individual characteristics but also by general equilibrium effects on the marriage market. Indeed, at the aggregate level, an equation relates the fraction of single men, the fraction of single women, the number of partners of non-single men relative to non-single women, and the sex ratio among singles – which itself depends on the sex ratio at birth, on age gaps between husbands and wives and on population growth. Note that I use the term "marriage" as a shorthand (admittedly reductive but convenient) to refer to all forms of heterosexual relationships, including marriage in the strict sense, as well as civil partnership and cohabitation. Similarly, the term "singles" refers to people who are not in a relationship with a potential reproductive partner.

In the second part of this article, I hypothesize that marriage markets shape gender gaps in childlessness. In particular, I study the role of gender imbalances in the population structure (sex ratio), in preferences (hypergamy), in rules (polygamy, divorce) and in reproductive capacity (men can procreate with several partners at the same time and for a longer period than women). I present a methodology to produce counterfactual scenarios that predict who would have matched with whom if a specific feature of the market had been different. I review three research projects using this methodology to quantify the effect of (i) the deterioration of sex ratios in China, (ii) changes in the drivers of polygamy in Sub-Saharan Africa, and (iii) the liberalization of divorce in France. I find that features of the marriage market making women relatively more scarce than men have a non-negligible effect on male childlessness. This suggests that the concept of "involuntary childless men" is empirically relevant.

1 Facts about female and male childlessness in the world

1.1 Data

I compiled data from five distinct sources: the Demographic and Health Surveys (DHS) covering low-and-middle income countries, the Generations and Gender Surveys (GGS) covering high income countries, the Arab Barometer, the Survey of Income and Program Participation (SIPP) in the United States and IPUMS in China. The final dataset covers 117 countries. I restrict the sample to men and women aged 40-49 (inclusive) at the time of the survey. A respondent's childlessness status is determined from their answer to a question of the form *"How many children do you have?"*. The exact formulation of the question depends on the source: number of children ever born in DHS, SIPP and IPUMS, number of biological and adopted children with current and past partners in GGS, and whether you have had any child in the Arab Barometer.[3] In IPUMS, this question is not posed to men; I infer their childlessness status from their wife's reported number of children which is a reasonable approximation in the Chinese context. Table 1 lists the data source, survey year, and method used to calculate the share of childlessness for each country and Table A1 reports the country-specific statistics.

[3] As for the number, the Arab Barometer only reports how many children live in the same household as the respondent, not how many were born. This is why these countries cannot be represented in Figure 1.

Table 1: Data sources and survey years by country

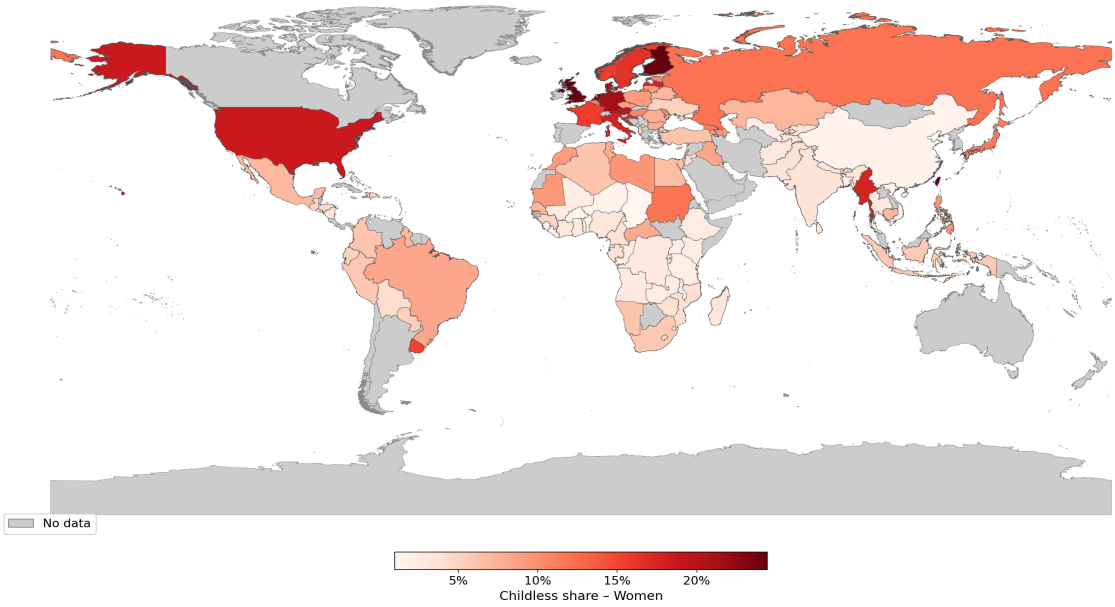
Country	Source	M.	Year(s)	Country	Source	M.	Year(s)	Country	Source	M.	Year(s)
Sub Saharan Africa				*Asia*				*Europe and US*			
Angola	DHS	a	2006, 2015	Afghanistan	DHS	a	2015	Albania	DHS	a	2009, 2017
Benin	DHS	a	2006, 2018	Armenia	DHS	a	2005, 2016	Austria	GGS I, II	a,b	2008, 2012, 2022
Burkina Faso	DHS	a	2003, 2010	Azerbaijan	DHS	a	2006	Belarus	GGS-II	a	2017
Burundi	DHS	a	2010, 2016	Bangladesh	DHS	a	2007, 2017	Belgium	GGS I	a	2008
Cameroon	DHS	a	2011, 2018	Cambodia	DHS	a	2005, 2014	Bulgaria	GGS I	a	2004, 2007
Central African Rep.	DHS	a	1994	China	IPUMS	c	2000	Croatia	GGS-II	b	2023
Chad	DHS	a	2004, 2015	Georgia	GGS I	a	2006, 2009	Czech Rep.	GGS I, II	a,b	2005, 2008, 2022, 2025
Comoros	DHS	a	2012	Hong Kong	GGS-II	b	2023	Denmark	GGS-II	b	2021
Congo	DHS	a	2005, 2011	India	DHS	a	2006, 2019	Estonia	GGS I, II	a,b	2005, 2021, 2025
Congo, DRC	DHS	a	2007, 2013	Indonesia	DHS	a	2007, 2017	Finland	GGS-II	b	2021
Cote d'Ivoire	DHS	a	2005, 2012	Japan	GGS I	c	2005	France	GGS I, II	a,b	2005, 2008, 2011, 2024
Ethiopia	DHS	a	1997, 2011	Kazakhstan	GGS-II	l	2018	Germany	GGS-II	a	2021
Gabon	DHS	a	2000, 2012	Kyrgyzstan	DHS	a	2012	Hungary	GGS I	a	2004, 2008, 2012
Ghana	DHS	a	2008, 2014	Maldives	DHS	a	2009, 2017	Italy	GGS I	a	2003
Guinea	DHS	a	2005, 2018	Myanmar	DHS	a	2016	Latvia	GGS-II	a	2018
Kenya	DHS	a	2003, 2014	Nepal	DHS	a	2007, 2017	Lithuania	GGS I	a	2006
Lesotho	DHS	a	2004, 2014	Pakistan	DHS	a	2006, 2018	Moldova	GGS-II	b	2020
Liberia	DHS	a	2007, 2019	Philippines	DHS	a	2008, 2017	Netherlands	GGS I, II	a,b	2003, 2023
Madagascar	DHS	a	2009, 2021	Sri Lanka	DHS	a	1987	Norway	GGS-II	b	2020, 2024
Malawi	DHS	a	2004, 2015	Taiwan	GGS-II	b	2024	Poland	GGS I	a	2010
Mali	DHS	a	2006, 2018	Tajikistan	DHS	i	2012, 2017	Romania	GGS I	a	2005
Mozambique	DHS	a	2003, 2011	Thailand	DHS	a	1987	Russia	GGS I	a	2004, 2007
Namibia	DHS	a	2007, 2013	Timor Leste	DHS	a	2009, 2016	Sweden	GGS I, II	a,b	2012, 2021
Niger	DHS	a	2006, 2012	Uzbekistan	DHS	a	1996	Ukraine	DHS	a	2007
Nigeria	DHS	a	2008, 2018	Vietnam	DHS	a	2002	United Kingdom	GGS-II	b	2023
Rwanda	DHS	a	2010, 2020	*MENA*				United States	SIPP	a	2021
Sao Tome & Principe	DHS	a	2008	Algeria	ArabBar	d	2020, 2022	*Latin America*			
Senegal	DHS	a	2011, 2019	Egypt	ArabBar	d	2022	Bolivia	DHS	a	2008
Sierra Leone	DHS	a	2008, 2019	Iraq	ArabBar	d	2021, 2022, 2024	Brazil	DHS	a	1996
South Africa	DHS	a	2016	Jordan	ArabBar	d	2020, 2022, 2023	Colombia	DHS	a	2005, 2015
Swaziland	DHS	a	2006	Kuwait	ArabBar	d	2022, 2024	Dominican Rep.	DHS	a	2002, 2013
Tanzania	DHS	a	2004, 2015	Lebanon	ArabBar	d	2020, 2021, 2024	Ecuador	DHS	a	1987
The Gambia	DHS	a	2013, 2020	Libya	ArabBar	d	2020, 2022	El Salvador	DHS	a	1985
Togo	DHS	a	2014	Mauritania	ArabBar	d	2022, 2024	Guatemala	DHS	a	2015
Uganda	DHS	a	2006, 2016	Morocco	ArabBar	d	2020, 2022, 2023	Guyana	DHS	a	2009
Zambia	DHS	a	2007, 2018	Palestine	ArabBar	d	2021, 2023	Haiti	DHS	a	2006, 2017
Zimbabwe	DHS	a	2005, 2015	Sudan	ArabBar	d	2022	Honduras	DHS	a	2006, 2012
				Tunisia	ArabBar	d	2020, 2021, 2023	Mexico	DHS	a	1987
				Turkey	DHS	a	2004, 2013	Nicaragua	DHS	a	2001
								Paraguay	DHS	a	1990
								Peru	DHS	a	2008, 2012
								Trinidad & Tobago	DHS	a	1987
								Uruguay	GGS-II	a	2022

Notes. "M." = method code. Sample restricted to respondents aged 40–49. **a** – Childlessness is assigned based on the respondent's reported number of children ever born. **b** – Childlessness is assigned based on the reported number of biological and adopted children from current and past partnerships. **c** – For women, childlessness is assigned based on the number of children ever born. For men, it is inferred by linking married respondents to their spouses and using the wife's reported number of children ever born. **d** – Childlessness is assigned based on the respondent's answer to binary do you have any children question.

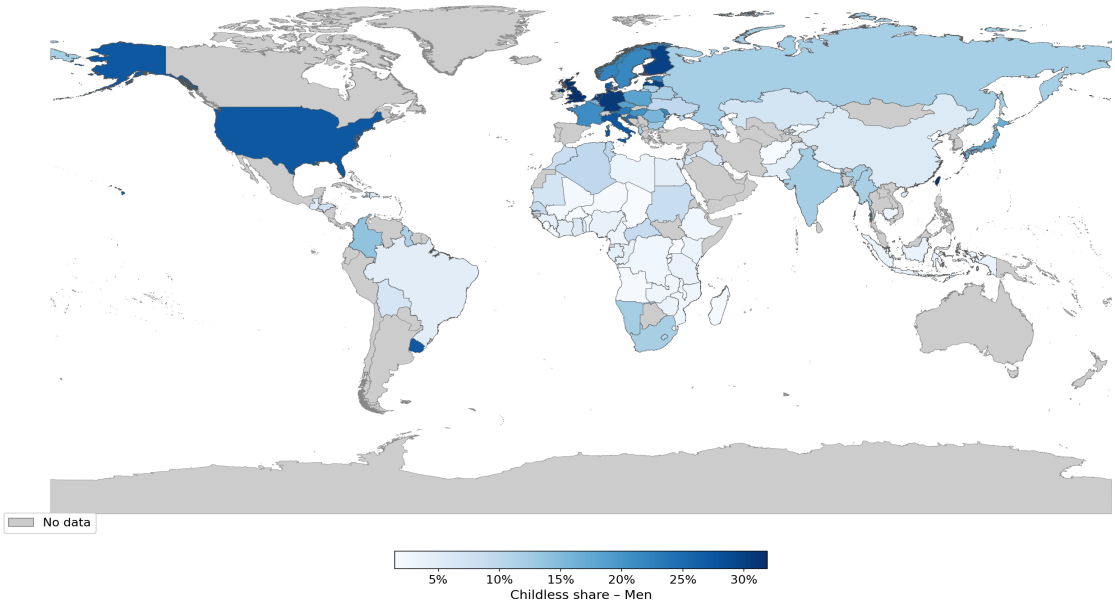
1.2 Maps

Figure 2: Share of childless women and childless men across the world

Panel A: Women



Panel B: Men



Notes: The maps show the share of childless individuals in age group 40-49 among women (Panel A in red) and men (Panel B in blue) for each country in the most recent survey available. Darker colors indicate higher shares. Source: Table A1.

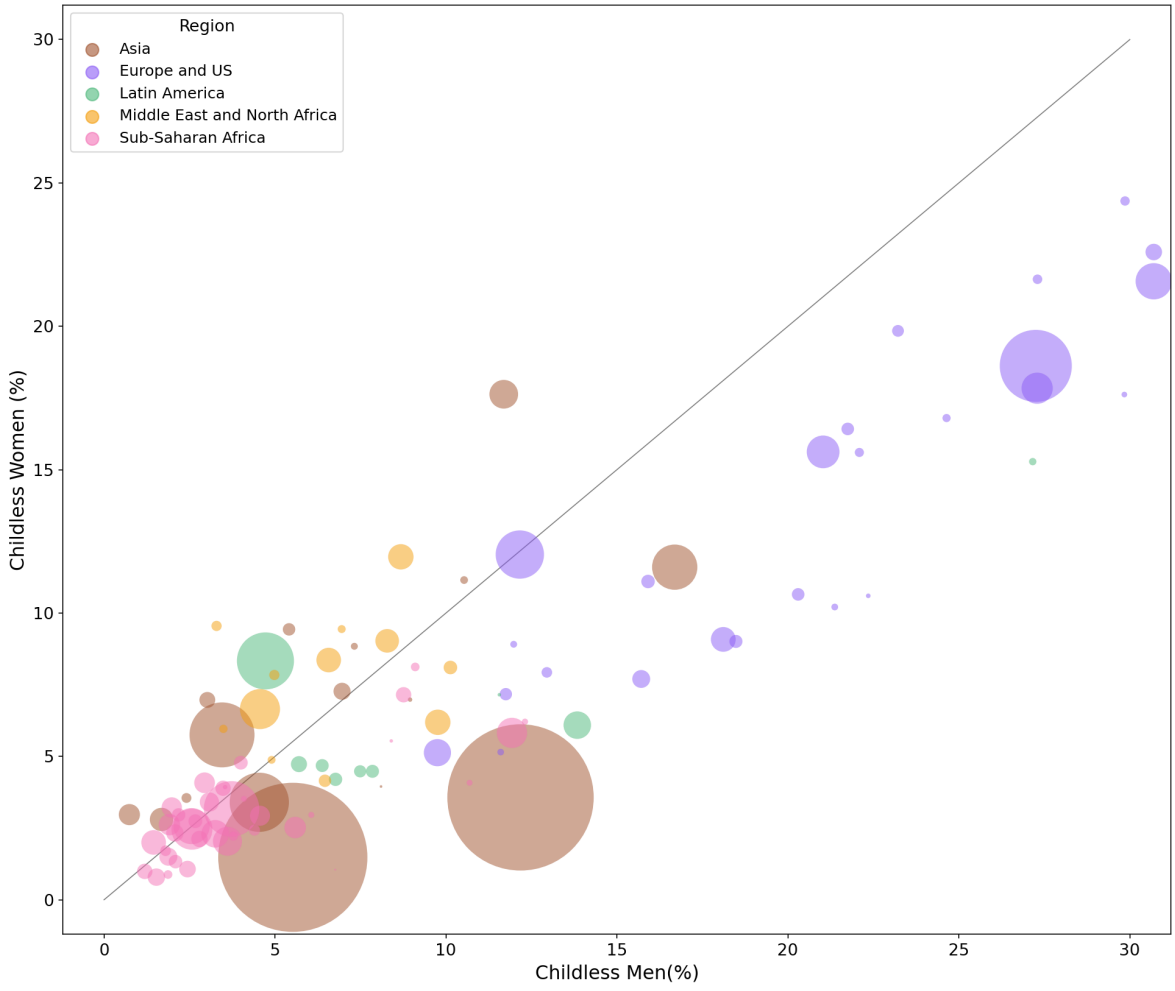
Figure 2 maps the share of childless women and men across the globe. There is a lot of heterogeneity. Among women, the share ranges from less than 1% in Burkina Faso and Liberia to around 30% in Hong Kong and Taiwan. Among men, rates close to 1% are found in Nepal, Uganda and Chad, while Hong Kong and Taiwan display again the highest values, over 30%. The (unweighted) cross-country mean is equal to 7.4% for women and 10.4% for men.

One extreme case is Sub-Saharan Africa (SSA), where both male and female childlessness are uniformly low, typically between 1.5% and 5%. At the other extreme, in high-income countries in Western Europe, America or East Asia, childlessness commonly exceeds 20% among women and 25% among men. Most countries in Eastern European, South and Southeast Asia, Latin America and Middle East and North Africa (MENA) occupy an intermediate position, with some heterogeneity within each region.

1.3 Gender gaps

To better compare women and men within a country, Figure 3 plots the male share on the x-axis and the female share on the y-axis, weighting each country by their population size. In the majority of the cases, the fraction of childless men is higher than the fraction of childless women. The gap widens markedly in high-income contexts, reaching 5 to 10 percentage points in Europe and the US. India and, to a smaller extent China, are characterized by very low levels of female childlessness combined with moderate levels of male childlessness. In a minority of countries, often located in MENA and South Asia, the male share is lower than the female share but the magnitude of the gap is relatively small.

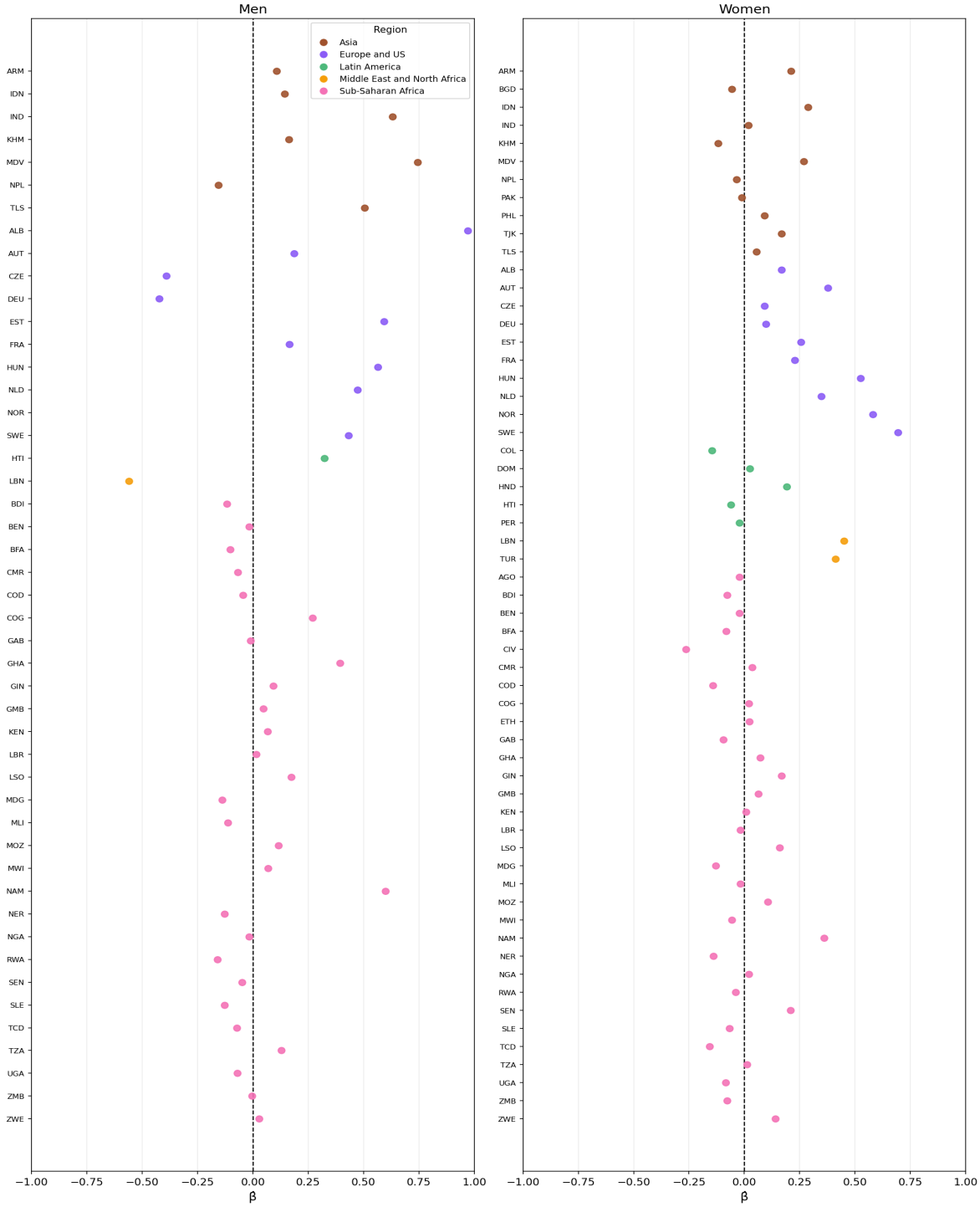
Figure 3: Gap between female and male childlessness



Notes: The x axis plots the share of childless men whereas the y axis plots the share of childless women for each country using the same data as in Figure 2. The size of the bubbles are proportional to each country's population and the color indicates the world region. Outliers Hong-Kong and Taiwan are not represented on the plot. Source: Table A1.

1.4 Trends

Figure 4: Trends in female and male childlessness, by country



Notes: Each dot shows the country-specific linear trend in childlessness among adults aged 40–49, estimated separately for men and women. The trend coefficient $\hat{\beta}_c$, interpreted as the annual change in percentage points, is obtained from a linear regression at the country-year level of the childlessness rate on country fixed effects and country-specific annual trends. Countries with fewer than two waves separated by at least four years are excluded. Countries are ordered by region and alphabetically by ISO code within region; color indicates world region. The dashed vertical line marks zero (no trend). A positive value indicates rising childlessness over time; a negative value indicates decline. Source: Table A1.

To look at trends, I keep countries with at least two survey waves that are at least four years apart and I estimate country-specific linear time trends. Specifically, I regress childlessness in a given country

in a given year on the year interacted with a country fixed effect, for each gender separately. Figure 4 plots the estimated annual trend country by country. Among men, positive trends are observed across most European countries and across South and Southeast Asia, ranging between 0.2 and 0.8 percentage points per year. In contrast, many Sub-Saharan African countries cluster around zero. Among women, the rise tends to be smaller in magnitude. Some countries display negative trends for men and/or women, but the magnitude is rarely larger than 0.2 percentage points per year.

Figure A1 in Appendix plots the distribution of these country-specific trends. The histogram confirms that male childlessness is changing more quickly than female childlessness. For women, the distribution is concentrated near zero with a median of +0.02 percentage points per year and few countries experiencing changes larger than 0.2 percentage points. For men, the distribution is more widespread, with a median of +0.06 percentage points per year and a fat right tail.

1.5 Correlates

Finally, I investigate how childlessness varies with socio-economic status proxied by education. In each country,[4] I use the median of the education distribution to partition individuals into the top half and the bottom half, and I compute the childlessness rate in each group. Then I estimate a weighted least squares regression at the country-education level, regressing the childlessness rate on the top-half indicator, including country fixed effects. I weigh each country according to their population size to ensure that the overall sample is representative.[5] The coefficient can be interpreted as the difference in the childlessness rate (in percentage points) between the above median and below median education groups. The sample is restricted to respondents aged 40–49 in the most recent available survey for each country, and regressions are estimated separately by sex.

Table 2: Correlation between education and childlessness, by gender and region

Specification	All	Asia	Europe and US	Latin America	MENA	Sub-Saharan Africa
Panel A: Men						
Above (country-specific) median education	−1.23	−1.02	−3.02**	0.48	−1.93	−0.47
	(1.12)	(1.89)	(1.44)	(0.42)	(1.42)	(0.41)
Mean dep. var.	9.7	8.1	22.8	6.8	6.4	3.9
N countries	99	18	25	8	12	36
Panel B: Women						
Above (country-specific) median education	1.77***	1.18***	3.46**	4.55***	0.10	1.61***
	(0.49)	(0.45)	(1.32)	(0.53)	(2.06)	(0.44)
Mean dep. var.	5.9	3.8	16.2	7.2	7.9	3.2
N countries	116	25	25	16	13	37

Notes: Each cell represents a separate regression and reports the estimated difference in childlessness rate between the groups above and below country and sex specific median level of education. Standard errors are in parentheses. The specification is aggregated at the country level, weighting each country according to their population size. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source: Table A1.

Results are reported in Table 2. The first column shows the average correlation in the whole sample and reveals opposite signs for men and women. Moving from the bottom half to the top half education group within a country is associated with a 1.8 percentage points *increase* in the fraction childless from a mean of 5.9% among women as opposed to a 1.2 percentage points *decrease* from a mean of 9.7% among men. Thus, childless women are disproportionately concentrated among the more educated, whereas childless men are disproportionately concentrated among the less educated. The female correlation is more precisely estimated than the male one. Results are then disaggregated by region. For women, the correlation is positive, large and significant everywhere, except in MENA.

[4] Except Latvia, for which I could not find the education variable in the pilot GGS survey.

[5] Alternative specifications without reweighting and/or using education terciles instead of the median give the same result: education is positively correlated with childlessness for women and negatively correlated for men.

For men, the correlation is strongly negative and significant in Europe and the US, more modest in MENA and Asia, and much closer to zero in SSA and Latin America.

Overall, the analysis reveals that the levels, trends and correlates of childlessness are different for men and women, and vary markedly across contexts. In the next section, I explore whether the structure of marriage markets can partly account for these patterns.

2 How marriage markets shape gender gaps in childlessness

2.1 Methodology

Choo and Siow (2006) propose an empirical model of the marriage market that can be used to explain how matches are formed given the population structure and people's preferences. In other words, the model rationalizes who marries whom given who is available and who likes whom. Separating out both forces allows us to study whether variations in matching patterns, e.g. assortative matching on education, are driven by variations in population structure, e.g. the relative supply of educated men and women, or by variations in preferences, e.g. the taste for homogamy. Importantly, we can build on this model to compute counterfactual scenarios predicting who would have married whom if one characteristic of the market had been different, holding all the other characteristics constant. In this section, I briefly explain how to infer the preferences based on observed matches and how to predict counterfactual matches.

Estimating preferences. Men and women are split into "types" (e.g. age, education). m_i is the number of men of type i and f_j is the number of women of type j who are available on the marriage market in a given period. Suppose that we observe who is matched with whom at the end of the period: μ_{ij} denotes the number of matches between a man of type i and a woman of type j; μ_{i0} and μ_{0j} are the number of men of type i and women of type j who remained unmatched, respectively. The key result in Choo and Siow (2006) is the following relationship:

$$\pi_{ij} = \ln\left(\frac{\mu_{ij}}{\sqrt{\mu_{i0}\mu_{0j}}}\right)$$

where π_{ij} is the *marital surplus*, defined as the per-capita systematic net gains to marriage (relative to remaining single) for couples consisting of i-type men and j-type women. The intuition behind this result is the following: if we observe many marriages between type i and type j, these unions must be valuable. However, it can also be that there are lots of men of type i and lots of women of type j. We need to "control for" the scale dimension in order to isolate the value dimension. We use the number of unmatched individuals of both types to do so. The value of a match is high if these matches are often observed relative to the frequency of types in the available population.[6]

Predicting counterfactuals. Once we have estimated the surplus π using observed matches μ, we can predict counterfactual matches μ' keeping π constant and changing population vectors to m' and f'. In practice, we use the algorithm developed by Qu, Galichon, Gao, and Ugander (2025) to solve:

$$\mu'_{i,j} = exp(\pi_{i,j}) \cdot \sqrt{\mu'_{i,0}} \cdot \sqrt{\mu'_{0,j}}$$

$$\text{subject to} \quad \mu'_{i,0} + \sum_j \mu'_{i,j} = m'_i \quad \text{and} \quad \mu'_{0,j} + \sum_i \mu'_{i,j} = f'_j$$

This allows us to answer questions such as: what would happen if the gender/age/education composition among available individuals was different? Who would match with whom and who would remain unmatched in this alternative world? Allowing for general equilibrium effects is an important contribution of this framework compared to previous quantitative models of the marriage market: matching outcomes between i-type men and j-type women are affected not only by the quantities of i-type men and j-type women but also by the quantities of men and women of all other types.

One limitation of the original model is to be static. It cannot address dynamic questions such as: what would have happened in the past 20 years if the sex ratio among cohorts entering the

[6] Technically, Choo and Siow (2006) derive this equation from a structural matching model with transferable utility and no search friction. The identification relies on assumptions regarding the distribution and the separability of unobserved heterogeneity in matching payoffs.

market during that period had been different? Or what will happen in the next 50 years if population growth slows down? Or what would happen if the rules governing remarriage changed? To answer these dynamic questions, we need to extend the original model to include the sequential entry of new cohorts, the potential re-entry of individuals already matched, and the accumulation of singles over time.

In the next sections, I present three applications studying the role of sex ratio, polygamy and divorce. These applications are described in detail in three research papers: *Left over or opting out? Squeeze, mismatch and surplus in Chinese marriage markets* (Rossi & Xiao, 2025), *Polygamy as a Ponzi scheme: how population growth shapes marriage markets in Africa* (Meier & Rossi, 2026), and *The serial monogamist and the involuntary celibate: how divorce shapes gender gaps in childlessness* (Rossi & Vallette, 2026). While the first paper is published, the other two are work-in-progress and the results presented here are susceptible to change during the revision process. The goal is to illustrate how the methodology can be used to study open questions rather than providing definitive answers to these questions.

2.2 In China: the role of imbalanced sex ratios

The Chinese marriage market is characterized by imbalanced sex ratios, monogamy, low divorce rates and very rare out-of-wedlock births. In these conditions, gender gaps in childlessness are mainly driven by gender gaps in being ever married. Using 2000 census data, we estimate that, among singles, the probability to marry within a year is 18% for women against 11% for men. As a consequence, men marry later than women and they are more likely to never marry. In the 40-49 age group, 1.5% of Chinese women and 5.5% of Chinese men are childless.

Since 2000, the marriage market has experienced three profound transformations. First, the sex ratio among incoming cohorts has deteriorated, leading to a marriage squeeze and fueling concerns about "leftover men". Second, education has risen faster for women than for men which, coupled with hypergamous preferences, has generated a shortage of suitable husbands for highly educated women who end up as "leftover women". Third, the perceived benefits of being married versus being single have decreased, prompting more individuals to "opt out" of marriage. As a result, marriage has declined. Among singles, the annual probability of marrying in 2019 was 9% for women and 6% for men, roughly half that of marrying in 1999.

We use our methodology to quantify the relative roles of each factor in a unified framework. We find that the deterioration of female-to-male ratio contributed to 13% of the decline for men, while *offsetting* 7% of the decline for women; in other words, men would have been more likely to marry and women less likely to marry if the sex ratio had not changed. The increase in the supply of educated people explains 45% of the decline in marriage for men and 55% of the decline for women, partly due to a mismatch between educated women and less-educated men. The decrease in the value of marriage (marital surplus) explains the rest. We conclude that imbalanced sex ratios in China contribute substantially to gender gaps in celibacy, and hence to gender gaps in childlessness.[7]

2.3 In Sub-Saharan Africa: the role of polygamy

In SSA, sex ratios are balanced and polygamy[8] is very prevalent: 5 to 35% of men have more than one wife depending on the country. Intuitively, we expect that many men can never marry because, every time a man takes a second wife, another man must remain single if there are as many men as women. This intuition is at odds with the very low levels of male childlessness in SSA and the weak correlation with education documented above.

In fact, the fraction of men who never marry has historically been low in Sub-Saharan African markets. This is possible because men marry younger women and the population is growing rapidly; once we consider the relevant age groups, there are more women than men on the marriage market. Just like in a Ponzi scheme, all men can marry and some men can marry twice as long as the bottom

[7] Unfortunately, we cannot compute the fraction of childless men and women in 2019 because the 2020 census data is not publicly available yet. For the analysis, we use aggregate statistics: they are enough to estimate the model but not enough to estimate childlessness.

[8] Polygamy is a marriage that includes more than two partners. It encompasses polygyny, in which a man has several wives, and polyandry, in which a woman has several husbands. I use the term polygamy to refer to the former situation, which is by far the most practiced form of polygamy.

of the population pyramid is constantly expanding. However, population growth in SSA is projected to slow down. The demographic conditions necessary to sustain high levels of polygamy while ensuring that all men eventually marry are therefore less likely to hold in the future.

We use our methodology to predict how marriage markets will respond to the decline in population growth: will polygamy disappear or will male celibacy explode? In theory, we find that the response (i) is stronger in markets with a high taste for age hypergamy and (ii) affects singles more than polygamists in markets with a low marital surplus. We provide an empirical application in Senegal, where we have rich data on marital trajectories. We consider two scenarios: what would happen by 2080 if the Senegalese population grows according to the UN projections? And what would happen in a world with no population growth at all? We predict that the share of never-married men, historically low at 3%, would double in the projected-growth scenario and quadruple in the zero-growth scenario. Polygamy would decline but would not disappear. Therefore, even though very low levels of male childlessness could coexist with polygamy in the past, this is unlikely to be sustainable if population growth slows down in SSA.

2.4 In France: the role of divorce and remarriage

In Western countries, gender gaps in childlessness have become remarkably salient over the past 50 years. This evolution coincides with the emergence of "serial monogamy", meaning that divorces and remarriages have become more frequent in these markets. In France, childlessness used to be similar for men and women, around 13% for cohorts born in 1945. While the fraction has barely changed for women, it has increased substantially for men, reaching 21% for the most recent cohort. This increase is concentrated at the bottom of the education distribution. Since 1975, divorce laws have been liberalized, with asymmetric effects on men and women: divorced men are more likely to remarry than divorced women, and they remarry (much) younger wives. In our data, 30% of men remarry versus 12% of women; the age gap is larger than 10 years in one third of male remarriages.

We use our methodology to investigate whether the liberalization of divorce can exacerbate the gender gap in childlessness. In theory, allowing divorcees to reenter the market has two opposite effects on younger generations: there are more potential reproductive partners available, but also more potential competitors. The *choice effect* dominates for young women while the *competition effect* dominates for young men under two conditions: (i) the taste for age hypergamy is sufficiently strong and (ii) female fertility decreases sufficiently quickly with age. This model can theoretically explain how the liberalization of divorce may lead to a polarization among men – between those who have children with multiple women and those who have none at all – whereas such a polarization is not observed among women. It can also explain why socioeconomic status is increasingly strongly associated with childlessness among men. Quantitatively, we estimate that the rise of divorce in the 1970s-80s accounts for a 1 percentage point increase in the childlessness gender gap. This is sizable but not enough to fully explain the trend observed in France.

3 Conclusion

This article provides a dataset and a methodology to study childlessness in the world. These tools should open the way to a more systematic analysis across countries and over time, a better understanding of the causes, and a more accurate forecast of the future. I present three applications illustrating the potential of quantitative models of the marriage market to push the research frontier. The conclusion is that individual childlessness is shaped by aggregate demographic forces, such as sex ratio and population growth, as well as marital institutions, such as polygamy and divorce. This result confirms that childlessness is at least partly circumstantial in the sense that some individuals would be able to find a reproductive partner in one marriage market but not in another. Understanding who gains and who loses in different markets is becoming a pressing question as childlessness makes the headlines. The possibility to form a family is a crucial dimension of welfare; inequalities between men and women, but also across men and across women, are likely to be hotly debated in the near future.

References

Case, A., & Deaton, A. (2017). Mortality and morbidity in the 21st century. *Brookings Papers on Economic Activity*, *2017*, 397.

Choo, E., & Siow, A. (2006). Who marries whom and why. *Journal of Political Economy*, *114*(1), 175–201.

Geruso, M., & Spears, D. (2025). *Childless or child-fewer? childlessness and parity progression where fertility is below replacement* (Tech. Rep.). National Bureau of Economic Research.

Hudson, V. M., & Den Boer, A. (2002). A surplus of men, a deficit of peace: Security and sex ratios in asia's largest states. *International Security*, *26*(4), 5–38.

Meier, L., & Rossi, P. (2026). *Polygamy as a ponzi scheme: how population growth shapes marriage markets in africa.* (Mimeo)

Qu, Z., Galichon, A., Gao, W., & Ugander, J. (2025). *On sinkhorn's algorithm and choice modeling.* Retrieved from https://arxiv.org/abs/2310.00260

Rossi, P. (2026). *Data and code for: Childlessness and the marriage market.* openICPSR. doi: 10.3886/E250195V1

Rossi, P., & Vallette, A. (2026). *The serial monogamist and the involuntary celibate: how divorce shapes gender gaps in childlessness.* (Mimeo)

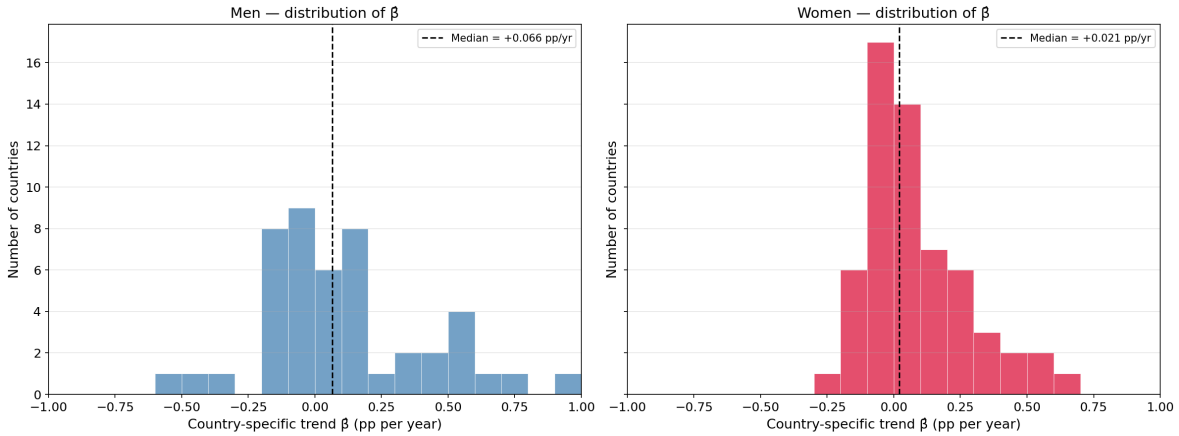
Rossi, P., & Xiao, Y. (2025). Left over or opting out? squeeze, mismatch and surplus in chinese marriage markets. *Journal of Development Economics*, 103629.

Schoumaker, B. (2019). Male fertility around the world and over time: How different is it from female fertility? *Population and Development Review*, 459–487.

Skirbekk, V. (2022). The new have-nots: childlessness in the twenty-first century. In *Decline and prosper! changing global birth rates and the advantages of fewer children* (pp. 105–140). Springer.

Appendix

Figure A1: Distribution of country-specific linear trends in childlessness



Notes: The histogram plots the distribution of country-specific linear trends estimated in Figure 4 for men (left panel) and women (right panel). Bin width is 0.1 pp per year. The dashed black line marks the cross-country median.

Table A1: Childlessness by country, survey year, sex and education level (ages 40–49)

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Afghanistan	2015	1.7	1.3	2.2	3,078	2.8	2.8	2.3	6,317	7.0
Albania	2009	3.8	3.5	6.4	1,046	3.8	3.2	4.5	2,300	2.8
Albania	2017	11.6	11.2	12.0	1,287	5.2	4.3	5.9	3,403	2.3
Algeria	2020	14.2	13.6	15.7	144	4.7	4.6	5.2	319	–
Algeria	2022	9.8	12.8	5.0	157	6.2	3.5	12.3	181	–
Angola	2006	–	–	–	–	2.8	4.3	1.8	478	6.6
Angola	2015	1.9	2.5	1.1	890	2.6	3.4	1.7	2,100	6.0
Armenia	2005	6.1	5.1	8.8	435	6.5	6.0	8.8	2,024	2.5
Armenia	2016	7.3	6.2	8.6	675	8.8	6.3	11.1	1,496	2.2
Austria	2008	20.1	20.7	18.7	528	14.8	12.9	19.0	789	1.9
Austria	2012	22.9	22.3	24.0	652	15.2	11.5	21.7	1,029	1.9
Austria	2022	23.2	22.1	25.0	750	19.8	18.3	21.6	1,156	1.6
Azerbaijan	2006	5.4	6.7	3.9	626	9.4	10.6	7.4	2,327	2.7
Bangladesh	2007	–	–	–	–	2.3	2.7	1.6	2,282	4.6
Bangladesh	2017	–	–	–	–	1.7	1.8	1.6	4,675	3.7
Belarus	2017	11.8	11.7	11.8	814	7.2	6.8	7.7	1,005	1.7
Belgium	2008	15.9	15.9	15.7	715	11.1	10.9	11.5	837	2.1
Benin	2006	2.3	2.0	2.6	838	1.6	1.0	3.9	3,049	6.4
Benin	2018	2.1	1.8	2.4	1,214	1.3	0.8	3.2	2,606	6.0
Bolivia	2008	6.8	5.6	8.1	1,081	4.2	3.1	5.7	3,403	4.9
Brazil	1996	4.7	4.4	5.2	491	8.3	5.9	11.4	2,547	3.7
Bulgaria	2004	12.6	12.2	15.0	1,024	6.9	5.8	8.7	1,297	1.8
Bulgaria	2007	12.9	13.5	10.7	799	7.9	5.8	12.4	1,135	1.8
Burkina Faso	2003	2.2	2.1	2.7	535	1.4	1.1	4.3	2,334	6.9
Burkina Faso	2010	1.5	1.0	3.4	1,322	0.8	0.5	2.7	2,986	6.8
Burundi	2010	2.9	2.3	3.7	653	3.4	3.6	2.9	1,429	6.6

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Burundi	2016	2.2	2.0	2.4	1,099	3.0	3.4	1.9	2,744	6.2
Cambodia	2005	1.6	1.2	1.9	1,375	8.0	7.5	8.7	3,771	4.9
Cambodia	2014	3.0	2.9	3.1	1,151	7.0	6.9	7.1	3,896	3.9
Cameroon	2011	3.5	3.6	3.5	1,082	3.2	4.1	2.0	2,461	5.9
Cameroon	2018	3.1	4.1	2.0	984	3.4	3.4	3.4	2,001	5.4
Central African Republic	1994	9.1	12.7	4.6	225	8.1	9.1	3.9	886	5.7
Chad	2004	2.0	0.2	4.8	296	2.7	3.1	0.3	1,043	7.1
Chad	2015	1.2	1.1	1.3	930	1.0	1.1	0.7	2,893	7.6
China	2000	5.5	6.5	2.3	737,389	1.5	1.4	1.7	793,716	2.2
Colombia	2005	–	–	–	–	7.6	4.3	10.8	8,693	3.1
Colombia	2015	13.8	14.5	13.3	6,162	6.1	3.0	8.7	8,588	2.7
Comoros	2012	8.4	4.4	13.5	344	5.5	4.1	7.6	757	5.3
Congo	2005	2.2	3.5	0.6	494	2.1	2.0	2.2	979	5.3
Congo	2011	3.8	4.3	3.4	1,029	2.2	1.2	3.1	1,927	5.0
Congo, DRC	2007	2.8	1.0	5.3	783	3.4	3.4	3.4	1,586	6.4
Congo, DRC	2013	2.6	3.7	1.2	1,478	2.6	2.2	2.9	2,918	6.4
Cote d'Ivoire	2005	–	–	–	–	4.8	4.5	5.3	1,554	5.7
Cote d'Ivoire	2012	4.6	3.9	5.1	827	2.9	2.5	3.7	1,594	5.8
Croatia	2023	24.6	25.1	23.1	967	16.8	13.8	23.0	1,195	1.6
Czech Rep.	2005	22.8	23.3	21.1	791	9.6	9.3	11.2	878	1.8
Czech Rep.	2008	25.3	26.4	19.1	222	8.1	8.1	8.1	295	1.8
Czech Rep.	2022	14.9	14.3	16.4	608	12.8	13.0	12.5	888	1.8
Czech Rep.	2025	18.5	19.0	17.2	385	9.0	4.3	0.0	639	1.9
Denmark	2021	27.3	28.5	20.5	1,298	21.6	22.7	14.7	1,405	1.7
Dominican Republic	2002	6.4	9.2	4.4	467	4.4	3.0	5.5	4,604	3.8
Dominican Republic	2013	–	–	–	–	4.7	3.2	6.2	2,074	3.2
Ecuador	1987	–	–	–	–	5.1	4.5	5.7	687	5.7
Egypt	2022	4.6	5.5	1.4	249	6.7	7.8	5.5	226	–
El Salvador	1985	–	–	–	–	4.3	3.7	4.8	842	6.1
Estonia	2005	10.6	13.7	7.0	541	6.3	6.1	6.6	935	2.1
Estonia	2021	20.4	22.2	16.1	1,027	12.0	11.2	12.6	1,299	1.9
Estonia	2025	22.4	41.8	8.6	709	10.6	3.7	10.2	822	2.0
Ethiopia	1997	2.6	2.4	2.9	916	2.2	1.8	5.1	2,261	6.9
Ethiopia	2011	–	–	–	–	2.5	1.8	4.3	1,252	6.5
Finland	2021	29.9	32.6	16.3	320	24.4	24.4	23.5	430	1.6
France	2005	18.8	–	–	834	11.2	–	–	1,062	2.1
France	2008	16.6	16.8	15.8	587	12.0	10.8	14.9	757	2.1
France	2011	19.9	16.8	23.5	538	13.0	13.4	12.4	737	1.9
France	2024	21.0	21.7	18.9	1,134	15.6	15.6	15.2	1,405	1.8
Gabon	2000	4.2	5.2	3.2	313	4.7	5.4	3.8	861	6.0
Gabon	2012	4.1	5.2	3.4	1,074	3.5	3.0	3.9	1,611	5.0
Georgia	2006	10.1	9.7	11.2	925	11.3	9.7	15.5	1,162	2.0
Georgia	2009	10.5	9.0	14.4	767	11.2	7.6	20.4	1,006	2.0
Germany	2005	42.5	44.5	38.2	951	24.4	25.2	22.3	1,240	1.4
Germany	2008	26.7	24.7	30.7	318	11.8	10.2	14.5	524	1.9
Germany	2021	30.7	31.5	29.5	2,892	21.6	21.8	18.1	3,568	1.6
Ghana	2008	3.2	2.9	4.7	759	2.1	0.8	3.2	920	5.2
Ghana	2014	5.6	4.9	6.2	800	2.5	1.9	3.0	1,902	4.8
Guatemala	2015	5.7	5.5	5.9	1,704	4.7	3.7	6.1	4,662	4.7
Guinea	2005	2.8	2.4	3.5	594	2.6	2.6	2.4	1,638	6.4
Guinea	2018	4.0	3.3	5.4	755	4.8	4.5	7.4	1,926	5.1

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Guyana	2009	11.6	11.8	11.5	876	7.2	7.2	7.1	1,189	3.4
Haiti	2006	4.3	4.3	4.3	748	5.1	2.7	8.6	1,924	5.5
Haiti	2017	7.8	8.0	7.8	1,398	4.5	2.1	7.0	2,525	4.5
Honduras	2006	–	–	–	–	3.3	2.2	4.4	3,496	5.1
Honduras	2012	7.5	8.6	6.4	1,263	4.5	3.1	5.5	4,007	4.4
Hong Kong	2023	34.4	34.6	33.2	477	26.2	22.7	37.0	631	1.1
Hungary	2004	15.8	18.5	10.9	1,051	6.5	5.8	9.4	1,300	2.0
Hungary	2008	16.6	17.7	11.5	740	5.8	5.3	6.8	1,017	2.4
Hungary	2012	20.3	20.3	20.5	570	10.7	8.1	15.2	800	1.9
India	2006	4.0	3.8	4.2	14,335	3.3	2.9	4.0	22,945	4.0
India	2019	12.2	10.9	13.5	21,671	3.6	3.1	4.0	165,439	3.0
Indonesia	2007	2.0	2.4	1.6	2,768	2.9	2.8	3.0	9,440	3.6
Indonesia	2017	3.5	3.6	3.3	3,594	5.8	4.4	8.5	13,275	2.8
Iraq	2021	9.5	9.5	9.6	78	1.2	1.9	0.0	90	–
Iraq	2022	13.3	14.6	11.5	149	10.6	8.6	12.6	193	–
Iraq	2024	6.6	7.0	5.8	159	8.4	6.2	10.9	207	–
Italy	2003	27.3	38.2	25.2	1,152	17.8	12.5	17.6	1,194	1.5
Japan	2005	16.7	19.5	14.1	811	11.6	10.6	13.1	977	–
Jordan	2020	3.1	2.8	4.4	366	3.1	3.7	1.7	274	–
Jordan	2022	6.3	6.2	6.4	247	2.2	3.1	0.0	239	–
Jordan	2023	6.5	6.4	6.5	227	4.2	4.1	4.3	267	–
Kazakhstan	2018	7.0	6.8	7.2	904	7.3	6.5	8.7	1,202	2.5
Kenya	2003	2.5	2.1	3.1	520	2.2	2.1	2.3	1,290	6.0
Kenya	2014	3.2	4.0	2.4	2,093	2.3	1.9	2.7	5,337	5.0
Kuwait	2022	1.0	1.1	0.0	105	2.5	1.7	13.2	113	–
Kuwait	2024	4.9	5.8	0.0	109	4.9	4.5	7.2	116	–
Kyrgyzstan	2012	2.4	2.4	2.4	569	3.5	2.9	4.3	1,825	3.4
Latvia	2018	29.8	–	–	124	17.6	–	–	193	1.5
Lebanon	2020	7.9	8.1	7.3	253	6.3	7.0	4.8	282	–
Lebanon	2021	5.0	4.5	5.8	194	5.9	5.4	7.4	228	–
Lebanon	2024	5.0	6.0	3.0	202	7.8	7.1	10.1	236	–
Lesotho	2004	8.9	8.2	9.7	336	2.5	2.5	2.5	1,305	4.7
Lesotho	2014	10.7	11.8	9.7	388	4.1	2.7	6.6	1,072	3.8
Liberia	2007	1.7	2.4	0.9	1,282	1.1	1.5	0.1	1,275	6.2
Liberia	2019	1.9	2.8	1.1	850	0.9	0.7	1.1	1,584	5.4
Libya	2020	6.4	6.8	6.0	298	8.7	7.8	10.2	193	–
Libya	2022	3.3	6.0	0.6	171	9.6	9.2	10.0	175	–
Lithuania	2006	12.0	14.8	9.1	904	8.9	8.1	11.0	915	1.8
Madagascar	2009	3.6	3.8	3.4	1,428	4.8	4.2	5.8	3,144	5.5
Madagascar	2021	2.0	1.9	2.0	1,468	3.2	2.4	4.6	3,399	4.9
Malawi	2004	1.7	3.1	0.3	474	1.7	2.3	1.1	1,710	6.5
Malawi	2015	2.4	2.1	3.0	1,071	1.1	1.2	0.8	3,583	6.0
Maldives	2009	2.1	2.3	1.6	461	1.8	1.6	2.1	1,740	5.1
Maldives	2017	8.1	7.5	9.2	883	4.0	3.5	4.3	1,623	3.5
Mali	2006	3.4	1.6	7.5	781	2.5	2.4	3.6	2,535	7.0
Mali	2018	2.1	2.1	2.0	860	2.3	2.3	2.3	1,525	6.6
Mauritania	2022	8.7	8.5	8.8	240	2.5	2.7	2.2	253	–
Mauritania	2024	7.0	5.2	9.9	119	9.4	5.0	13.8	108	–
Mexico	1987	–	–	–	–	7.0	5.6	9.2	1,487	5.8
Moldova	2020	21.4	22.2	19.2	580	10.2	11.1	8.5	825	1.9
Morocco	2020	8.7	11.6	1.6	207	3.2	1.0	9.9	286	–

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Morocco	2022	6.2	4.6	9.4	178	6.6	6.5	6.9	215	–
Morocco	2023	8.3	6.6	9.9	177	9.0	12.6	2.1	184	–
Mozambique	2003	2.0	3.0	0.3	424	3.2	3.8	2.4	2,071	6.1
Mozambique	2011	2.9	4.0	1.2	531	4.1	3.7	4.9	2,206	5.5
Myanmar	2016	11.7	9.7	14.5	1,247	17.6	14.4	24.6	3,388	3.0
Namibia	2007	8.7	12.2	5.2	603	4.0	2.6	5.6	1,664	4.4
Namibia	2013	12.3	12.1	12.5	713	6.2	3.6	9.2	1,696	3.7
Nepal	2007	2.3	3.3	1.3	821	3.3	3.1	4.9	1,964	4.9
Nepal	2017	0.7	0.4	1.0	896	3.0	2.0	5.1	2,467	3.8
Netherlands	2003	21.2	20.0	22.8	771	15.7	12.4	23.1	1,027	2.0
Netherlands	2023	30.7	34.9	24.8	687	22.6	22.4	23.3	1,018	1.7
Nicaragua	2001	–	–	–	–	3.3	1.7	4.7	2,245	5.3
Niger	2006	2.6	2.5	3.2	681	2.3	2.3	2.5	1,554	7.8
Niger	2012	1.9	1.0	4.7	803	1.5	1.2	3.5	1,744	7.9
Nigeria	2008	3.9	2.9	5.1	2,598	3.0	2.6	3.3	5,948	6.5
Nigeria	2018	3.7	3.8	3.6	2,683	3.2	2.0	5.5	7,948	6.1
Norway	2020	17.9	18.4	15.6	650	13.3	12.9	14.1	788	1.9
Norway	2024	22.1	16.7	1.4	445	15.6	11.9	12.0	586	1.8
Pakistan	2006	–	–	–	–	3.5	3.7	3.1	2,510	6.1
Pakistan	2018	4.5	5.7	2.9	1,176	3.4	3.8	2.7	3,383	5.2
Palestine	2021	2.1	3.2	0.0	170	3.5	2.5	4.1	194	–
Palestine	2023	3.5	2.0	6.0	119	6.0	4.8	9.7	133	–
Paraguay	1990	–	–	–	–	5.3	3.0	7.5	1,040	5.2
Peru	2008	–	–	–	–	6.0	2.8	8.4	9,449	3.8
Peru	2012	–	–	–	–	5.9	3.0	8.5	5,672	3.5
Philippines	2008	–	–	–	–	8.5	6.0	13.8	2,974	4.0
Philippines	2017	–	–	–	–	9.3	8.0	12.2	5,776	3.4
Poland	2010	18.1	18.3	17.0	1,225	9.1	7.6	13.1	1,527	2.0
Romania	2005	15.7	15.9	14.8	1,046	7.7	7.2	10.6	950	2.0
Russia	2004	5.5	6.5	4.0	880	4.3	4.3	0.0	1,462	2.0
Russia	2007	12.2	14.0	9.0	570	12.0	11.5	14.1	1,091	1.8
Rwanda	2010	4.3	3.9	4.8	840	3.1	2.4	4.1	2,257	5.9
Rwanda	2020	2.7	2.3	3.1	1,010	2.7	2.7	2.8	2,717	5.0
Sao Tome & Principe	2008	6.8	10.5	3.8	379	1.1	0.7	1.6	506	5.8
Senegal	2011	9.1	4.6	15.3	696	5.5	3.0	13.1	2,313	5.7
Senegal	2019	8.8	5.4	12.1	513	7.2	5.1	10.6	1,267	5.3
Sierra Leone	2008	3.2	3.7	2.5	666	2.5	2.5	2.3	1,178	5.5
Sierra Leone	2019	1.8	1.1	2.6	1,327	1.7	1.6	2.3	2,679	5.2
South Africa	2016	11.9	14.0	10.1	605	5.8	5.0	6.6	1,877	2.9
Sri Lanka	1987	–	–	–	–	3.0	2.7	3.5	1,559	4.6
Sudan	2022	8.7	8.9	8.4	167	12.0	12.1	11.6	159	–
Swaziland	2006	3.5	4.7	2.2	538	3.9	3.9	4.0	825	5.3
Sweden	2012	17.9	19.1	15.4	859	10.2	11.1	9.1	968	2.3
Sweden	2021	21.8	21.9	21.0	966	16.4	17.5	11.3	1,172	1.6
Taiwan	2024	40.0	40.5	37.0	869	32.4	30.4	41.9	1,012	1.3
Tajikistan	2012	–	–	–	–	2.7	2.9	2.0	1,932	4.5
Tajikistan	2017	–	–	–	–	3.6	3.2	3.7	2,176	3.8
Tanzania	2004	2.2	2.5	0.1	448	1.9	2.3	1.5	1,655	6.4
Tanzania	2015	3.6	3.4	4.8	621	2.0	2.0	2.0	2,382	5.7
Thailand	1987	–	–	–	–	2.5	2.0	8.2	1,652	4.7
The Gambia	2013	5.7	1.1	11.1	535	2.5	2.2	3.7	1,336	6.0

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
The Gambia	2020	6.1	4.7	7.0	725	3.0	2.2	4.3	1,791	5.8
Timor Leste	2009	5.4	5.1	5.8	868	6.6	7.2	5.6	2,494	5.8
Timor Leste	2016	8.9	10.3	7.2	935	7.0	6.7	7.3	2,545	5.0
Togo	2014	4.4	3.9	5.0	784	2.4	1.3	3.6	1,751	5.3
Trinidad & Tobago	1987	–	–	–	–	6.9	3.8	10.5	649	4.3
Tunisia	2020	9.0	9.0	5.7	260	12.3	12.2	12.7	275	–
Tunisia	2021	7.2	6.6	8.0	201	3.7	4.8	2.1	223	–
Tunisia	2023	10.1	7.6	19.3	175	8.1	7.2	9.0	245	–
Turkey	2004	–	–	–	–	2.6	2.6	2.6	2,323	3.6
Turkey	2013	–	–	–	–	6.3	4.4	10.9	2,356	2.9
Uganda	2006	2.1	3.0	1.3	380	2.9	2.7	3.0	1,324	7.3
Uganda	2016	1.4	2.5	0.2	855	2.0	1.7	2.4	2,805	6.8
Ukraine	2007	9.8	12.5	6.8	904	5.1	4.4	5.9	2,028	1.7
United Kingdom	2023	31.9	33.1	27.1	707	24.5	23.1	29.7	1,114	1.6
United States	2021	27.2	27.0	27.5	1,589	18.6	15.5	22.1	1,622	1.9
Uruguay	2022	27.2	26.3	28.4	445	15.3	12.2	18.0	824	1.8
Uzbekistan	1996	–	–	–	–	2.3	1.8	3.2	761	4.6
Vietnam	2002	–	–	–	–	1.5	1.4	1.6	1,877	3.6
Zambia	2007	2.8	3.2	2.4	868	3.0	2.6	3.4	995	6.5
Zambia	2018	2.8	3.2	2.3	1,989	2.1	1.1	3.2	2,232	5.9
Zimbabwe	2005	3.2	3.5	2.9	878	2.5	2.8	2.1	1,338	5.2
Zimbabwe	2015	3.5	3.4	3.6	1,375	3.9	3.1	4.8	1,561	4.2

Notes: The table shows the share of childless men and women, for high, low education and the combined sample. High and low education categories are determined by splitting the total sample of ages 40–49 for each gender into two groups based on the median level of education. The median value is gender-, country-, and year-specific. Respondents whose education level is greater than or equal to the median are classified as high education, and those with below-median education are classified as low education. Italy is an exception, since the distribution of education values did not allow for the creation of two groups, as the median level is the maximum education value. Thus, for Italy, two groups are created instead: less than or equal to the median, or strictly above the median. N is the size of the 40–49 age group, used as the denominator for each gender. Avg. no. kids/woman is the total number of children divided by the total number of women in the 40–49 age group. Source: See Table 1 for details about each country's data source.

CREST
CENTER FOR RESEARCH
IN ECONOMICS AND STATISTICS

CREST
Center for Research in Economics and Statistics
UMR 9194

5 Avenue Henry Le Chatelier
TSA 96642
91764 Palaiseau Cedex
FRANCE

Phone: +33 (0)1 70 26 67 00
Email: info@crest.science
https://crest.science/

The Center for Research in Economics and Statistics (CREST) is a leading French scientific institution for advanced research on quantitative methods applied to the social sciences.

CREST is a joint interdisciplinary unit of research and faculty members of CNRS, ENSAE Paris, ENSAI and the Economics Department of Ecole Polytechnique. Its activities are located physically in the ENSAE Paris building on the Palaiseau campus of Institut Polytechnique de Paris and secondarily on the Ker-Lann campus of ENSAI Rennes.

cnrs

GENES Groupe des écoles nationales d'économie et statistique

Childlessness and the marriage market

Pauline Rossi (CREST - Ecole Polytechnique)*

July 7, 2026

Invited article for the 80th anniversary issue of *Population*

Abstract

Long overlooked, childlessness is set to become a crucial topic in demography. It is linked to heated debates about ultra-low fertility among women and involuntary celibacy among men. In this article, I present key facts on female and male childlessness using large-scale surveys in 117 countries. The proportion of men who never have children is higher than that of women in most contexts. To understand why, I explore the role of general equilibrium effects on the marriage market: can a man be involuntarily childless due to a relative shortage of female partners? I summarize the results of three projects examining skewed sex ratios in Asia, polygamy in Africa and serial monogamy (divorce and remarriage) in Europe. I conclude that market features are quantitatively important drivers of gender gaps in childlessness, supporting the premise that the marriage market shapes reproductive inequalities in ways that deserve more exploration.

Keywords: Fertility, Childlessness, Marriage Market, Sex ratio, Polygamy, Divorce

*This research was funded by the European Union (ERC project P3OPLE). Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Research Council. Neither the European Union nor the granting authority can be held responsible for them. I am grateful to Zeynep Doga Bulamac for excellent research assistance. The replication package is available at: https://doi.org/10.3886/E250195V1

Fertility studies tend to focus on the average number of children per woman. This is important to predict population growth, but not enough to speak to two questions likely to shape the field of demography in the coming years: how low will fertility drop and who will have children? To answer these questions, we have to study the extensive margin of fertility – childlessness.

On the one hand, the global decline of birth rates has recently renewed the public interest in fertility. In a majority of countries, the average number of children per woman has fallen below the replacement level, triggering debates about the causes of ultra-low fertility. Are low birth rates driven by a high fraction of women who do not have children or by a low number of children among those who do have children? The answer is both, but with different weights in different countries. Figure 1 plots the share of childless women against the average number of children per woman across countries. While high average fertility rates are systematically associated with low childlessness rates, average rates below the replacement level can coexist with a share of childless women as low as 5% or as high as 30% depending on the country. Understanding this heterogeneity is important because what causes childlessness to be high might be quite different from what causes sibship size to be small. Having children or not, and how many to have conditional on having some, are not determined by the exact same factors. This implies that pro-natalist policies effective in one country might be ineffective somewhere else because they target a margin which is irrelevant in the other context.[1]

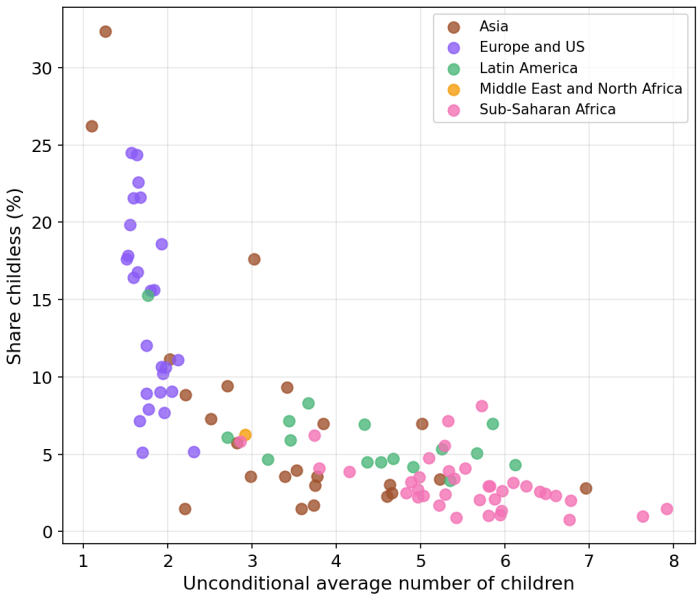


Figure 1: Childlessness *versus* average number of children

Notes: The figure plots the average number of children per woman on the x-axis and the share of childless women on the y-axis. Each dot is a country and the color indicates the world region. The sample consists of women aged 40 to 49 in the most recent survey available. See section 1 for details about the data. Source: Table A1.

On the other hand, a new topic has started to attract attention: single men known as "bare branches" in Asia and "incels" (involuntary celibates) in the Western world. There is a rapidly growing concern that men's inability to form a family could provoke mental health disorders and social unrest (Case & Deaton, 2017; Hudson & Den Boer, 2002). A major challenge in studying male childlessness is the paucity of consolidated data on male fertility.[2] Social scientists usually analyze fertility data at the woman level, because they implicitly assume that men and women are two sides of the same coin. However, this is only true if marriage is monogamous, stable and universal, which is not the case in

[1] In the aggregate, across high-income countries, Geruso and Spears (2025) estimate that close to 40% of the change in average completed cohort fertility is due to increased childlessness and the remaining 60% is due to declining number of children among mothers.

[2] An exception is Schoumaker (2019). The author computes the male age-specific fertility rates across the world circa 2010 and shows that they differ from female ones. These rates are obtained by dividing the numbers of births over a one-year period by the number of men, for each age group. They are informative about the mean, but not about other moments of the distribution such as the share of childless men.

most contexts as we will see. As a result, simple questions regarding the levels, trends and correlates of male childlessness across the world are hard to answer.

In the first part of this article, I produce a systematic analysis of female and male childlessness using data on individuals aged 40 to 49 in 117 countries. I establish three important facts. In most countries, (i) the fraction of childless men is systematically higher than the fraction of childless women, (ii) childlessness has increased more for men than for women, and (iii) the correlation between childlessness and socio-economic status is negative among men and positive among women. The levels, trends and/or correlates of female and/or male childlessness have been documented in a variety of case studies (for more details, see references in Skirbekk (2022) in the chapter on childlessness in the twenty-first century). My goal here is to provide a unified analysis drawing from several series of large-scale surveys in a substantial number of countries covering all world regions and all levels of economic development. The consolidated dataset is available in Rossi (2026) and reproduced in Table A1.

How to explain these facts? The literature on the causes of childlessness usually distinguishes between voluntary childlessness (individuals choosing to remain "childfree") and involuntary childlessness driven by biological infertility. More recently, the concept of "circumstantial" childlessness has been forged to account for the fact that a sizable share of individuals end up childless without explicitly intending to do so and without being hindered by health problems. One of the key circumstances is the inability to find the right partner at the right time. This inability is not only driven by individual characteristics but also by general equilibrium effects on the marriage market. Indeed, at the aggregate level, an equation relates the fraction of single men, the fraction of single women, the number of partners of non-single men relative to non-single women, and the sex ratio among singles – which itself depends on the sex ratio at birth, on age gaps between husbands and wives and on population growth. Note that I use the term "marriage" as a shorthand (admittedly reductive but convenient) to refer to all forms of heterosexual relationships, including marriage in the strict sense, as well as civil partnership and cohabitation. Similarly, the term "singles" refers to people who are not in a relationship with a potential reproductive partner.

In the second part of this article, I hypothesize that marriage markets shape gender gaps in childlessness. In particular, I study the role of gender imbalances in the population structure (sex ratio), in preferences (hypergamy), in rules (polygamy, divorce) and in reproductive capacity (men can procreate with several partners at the same time and for a longer period than women). I present a methodology to produce counterfactual scenarios that predict who would have matched with whom if a specific feature of the market had been different. I review three research projects using this methodology to quantify the effect of (i) the deterioration of sex ratios in China, (ii) changes in the drivers of polygamy in Sub-Saharan Africa, and (iii) the liberalization of divorce in France. I find that features of the marriage market making women relatively more scarce than men have a non-negligible effect on male childlessness. This suggests that the concept of "involuntary childless men" is empirically relevant.

1 Facts about female and male childlessness in the world

1.1 Data

I compiled data from five distinct sources: the Demographic and Health Surveys (DHS) covering low-and-middle income countries, the Generations and Gender Surveys (GGS) covering high income countries, the Arab Barometer, the Survey of Income and Program Participation (SIPP) in the United States and IPUMS in China. The final dataset covers 117 countries. I restrict the sample to men and women aged 40-49 (inclusive) at the time of the survey. A respondent's childlessness status is determined from their answer to a question of the form *"How many children do you have?"*. The exact formulation of the question depends on the source: number of children ever born in DHS, SIPP and IPUMS, number of biological and adopted children with current and past partners in GGS, and whether you have had any child in the Arab Barometer.[3] In IPUMS, this question is not posed to men; I infer their childlessness status from their wife's reported number of children which is a reasonable approximation in the Chinese context. Table 1 lists the data source, survey year, and method used to calculate the share of childlessness for each country and Table A1 reports the country-specific statistics.

[3] As for the number, the Arab Barometer only reports how many children live in the same household as the respondent, not how many were born. This is why these countries cannot be represented in Figure 1.

Table 1: Data sources and survey years by country

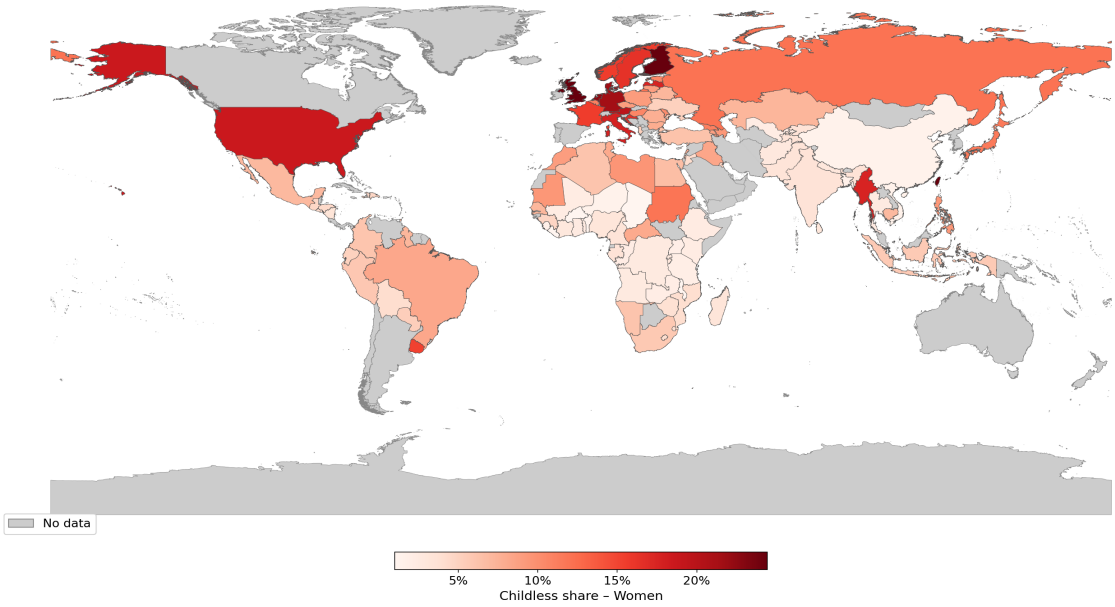
Country	Source	M.	Year(s)	Country	Source	M.	Year(s)	Country	Source	M.	Year(s)
Sub Saharan Africa				*Asia*				*Europe and US*			
Angola	DHS	a	2006, 2015	Afghanistan	DHS	a	2015	Albania	DHS	a	2009, 2017
Benin	DHS	a	2006, 2018	Armenia	DHS	a	2005, 2016	Austria	GGS I, II	a,b	2008, 2012, 2022
Burkina Faso	DHS	a	2003, 2010	Azerbaijan	DHS	a	2006	Belarus	GGS-II	a	2017
Burundi	DHS	a	2010, 2016	Bangladesh	DHS	a	2007, 2017	Belgium	GGS I	a	2008
Cameroon	DHS	a	2011, 2018	Cambodia	DHS	a	2005, 2014	Bulgaria	GGS I	a	2004, 2007
Central African Rep.	DHS	a	1994	China	IPUMS	c	2000	Croatia	GGS-II	b	2023
Chad	DHS	a	2004, 2015	Georgia	GGS I	a	2006, 2009	Czech Rep.	GGS I, II	a,b	2005, 2008, 2022, 2025
Comoros	DHS	a	2012	Hong Kong	GGS-II	b	2023	Denmark	GGS-II	b	2021
Congo	DHS	a	2005, 2011	India	DHS	a	2006, 2019	Estonia	GGS I, II	a,b	2005, 2021, 2025
Congo, DRC	DHS	a	2007, 2013	Indonesia	DHS	a	2007, 2017	Finland	GGS-II	b	2021
Cote d'Ivoire	DHS	a	2005, 2012	Japan	GGS I	c	2005	France	GGS I, II	a,b	2005, 2008, 2011, 2024
Ethiopia	DHS	a	1997, 2011	Kazakhstan	GGS-II	l	2018	Germany	GGS-II	a	2021
Gabon	DHS	a	2000, 2012	Kyrgyzstan	DHS	a	2012	Hungary	GGS I	a	2004, 2008, 2012
Ghana	DHS	a	2008, 2014	Maldives	DHS	a	2009, 2017	Italy	GGS I	a	2003
Guinea	DHS	a	2005, 2018	Myanmar	DHS	a	2016	Latvia	GGS-II	a	2018
Kenya	DHS	a	2003, 2014	Nepal	DHS	a	2007, 2017	Lithuania	GGS I	a	2006
Lesotho	DHS	a	2004, 2014	Pakistan	DHS	a	2006, 2018	Moldova	GGS-II	b	2020
Liberia	DHS	a	2007, 2019	Philippines	DHS	a	2008, 2017	Netherlands	GGS I, II	a,b	2003, 2023
Madagascar	DHS	a	2009, 2021	Sri Lanka	DHS	a	1987	Norway	GGS-II	b	2020, 2024
Malawi	DHS	a	2004, 2015	Taiwan	GGS-II	b	2024	Poland	GGS I	a	2010
Mali	DHS	a	2006, 2018	Tajikistan	DHS	i	2012, 2017	Romania	GGS I	a	2005
Mozambique	DHS	a	2003, 2011	Thailand	DHS	a	1987	Russia	GGS I	a	2004, 2007
Namibia	DHS	a	2007, 2013	Timor Leste	DHS	a	2009, 2016	Sweden	GGS I, II	a,b	2012, 2021
Niger	DHS	a	2006, 2012	Uzbekistan	DHS	a	1996	Ukraine	DHS	a	2007
Nigeria	DHS	a	2008, 2018	Vietnam	DHS	a	2002	United Kingdom	GGS-II	b	2023
Rwanda	DHS	a	2010, 2020	*MENA*				United States	SIPP	a	2021
Sao Tome & Principe	DHS	a	2008	Algeria	ArabBar	d	2020, 2022	*Latin America*			
Senegal	DHS	a	2011, 2019	Egypt	ArabBar	d	2022	Bolivia	DHS	a	2008
Sierra Leone	DHS	a	2008, 2019	Iraq	ArabBar	d	2021, 2022, 2024	Brazil	DHS	a	1996
South Africa	DHS	a	2016	Jordan	ArabBar	d	2020, 2022, 2023	Colombia	DHS	a	2005, 2015
Swaziland	DHS	a	2006	Kuwait	ArabBar	d	2022, 2024	Dominican Rep.	DHS	a	2002, 2013
Tanzania	DHS	a	2004, 2015	Lebanon	ArabBar	d	2020, 2021, 2024	Ecuador	DHS	a	1987
The Gambia	DHS	a	2013, 2020	Libya	ArabBar	d	2020, 2022	El Salvador	DHS	a	1985
Togo	DHS	a	2014	Mauritania	ArabBar	d	2022, 2024	Guatemala	DHS	a	2015
Uganda	DHS	a	2006, 2016	Morocco	ArabBar	d	2020, 2022, 2023	Guyana	DHS	a	2009
Zambia	DHS	a	2007, 2018	Palestine	ArabBar	d	2021, 2023	Haiti	DHS	a	2006, 2017
Zimbabwe	DHS	a	2005, 2015	Sudan	ArabBar	d	2022	Honduras	DHS	a	2006, 2012
				Tunisia	ArabBar	d	2020, 2021, 2023	Mexico	DHS	a	1987
				Turkey	DHS	a	2004, 2013	Nicaragua	DHS	a	2001
								Paraguay	DHS	a	1990
								Peru	DHS	a	2008, 2012
								Trinidad & Tobago	DHS	a	1987
								Uruguay	GGS-II	a	2022

Notes. "M." = method code. Sample restricted to respondents aged 40–49. **a** – Childlessness is assigned based on the respondent's reported number of children ever born. **b** – Childlessness is assigned based on the reported number of biological and adopted children from current and past partnerships. **c** – For women, childlessness is assigned based on the number of children ever born. For men, it is inferred by linking married respondents to their spouses and using the wife's reported number of children ever born. **d** – Childlessness is assigned based on the respondent's answer to binary do you have any children question.

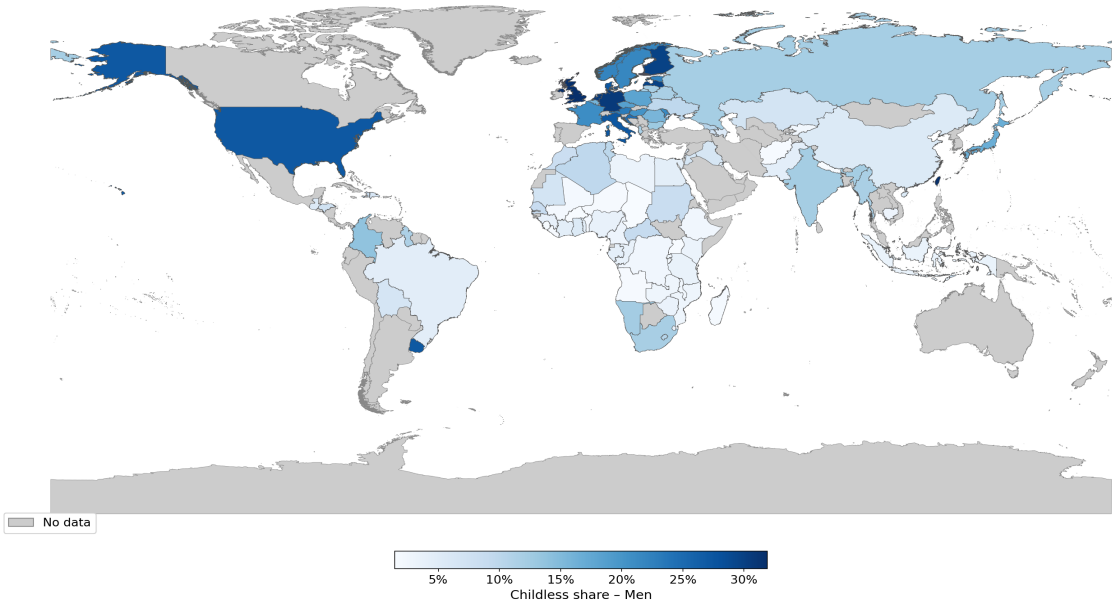
1.2 Maps

Figure 2: Share of childless women and childless men across the world

Panel A: Women



Panel B: Men



Notes: The maps show the share of childless individuals in age group 40-49 among women (Panel A in red) and men (Panel B in blue) for each country in the most recent survey available. Darker colors indicate higher shares. Source: Table A1.

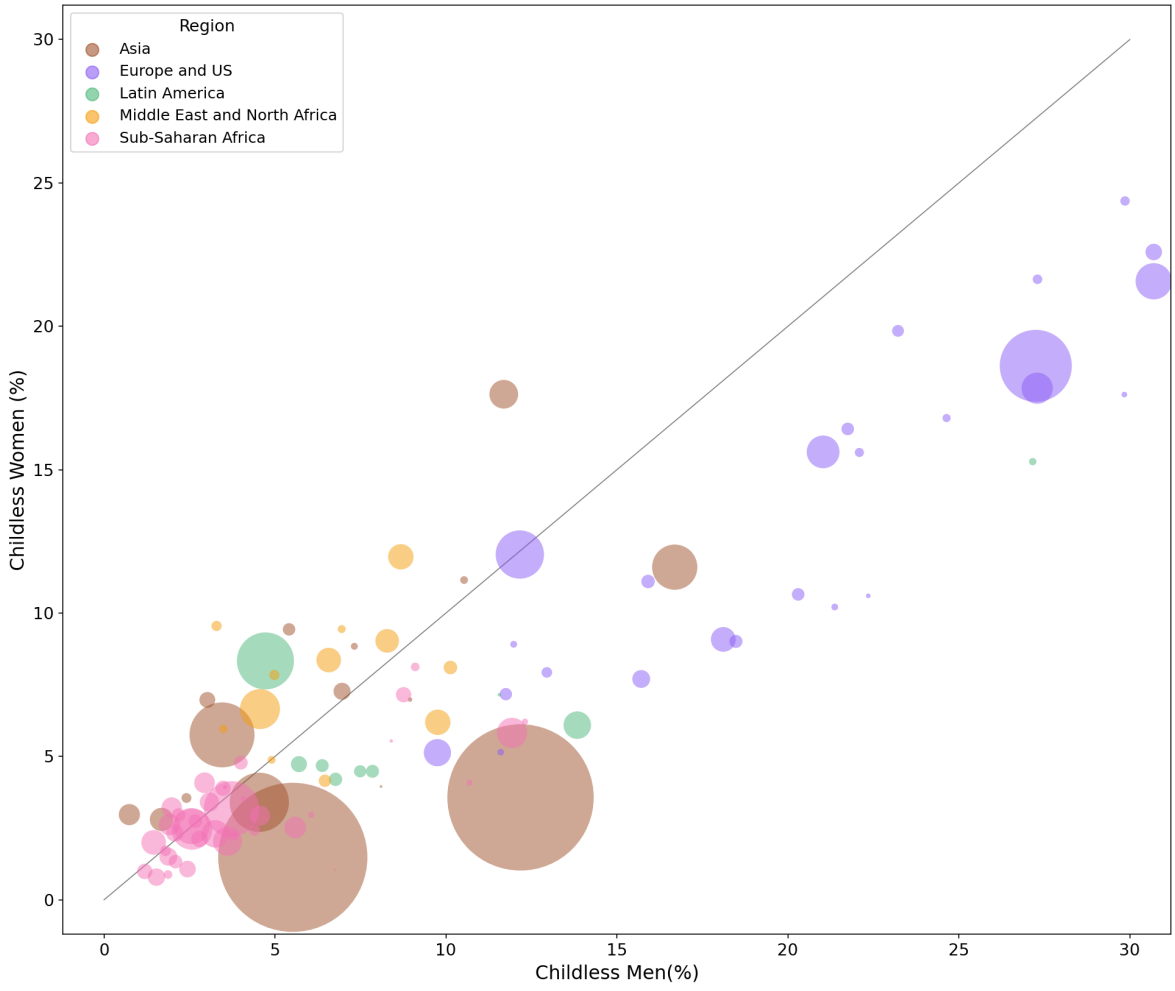
Figure 2 maps the share of childless women and men across the globe. There is a lot of heterogeneity. Among women, the share ranges from less than 1% in Burkina Faso and Liberia to around 30% in Hong Kong and Taiwan. Among men, rates close to 1% are found in Nepal, Uganda and Chad, while Hong Kong and Taiwan display again the highest values, over 30%. The (unweighted) cross-country mean is equal to 7.4% for women and 10.4% for men.

One extreme case is Sub-Saharan Africa (SSA), where both male and female childlessness are uniformly low, typically between 1.5% and 5%. At the other extreme, in high-income countries in Western Europe, America or East Asia, childlessness commonly exceeds 20% among women and 25% among men. Most countries in Eastern European, South and Southeast Asia, Latin America and Middle East and North Africa (MENA) occupy an intermediate position, with some heterogeneity within each region.

1.3 Gender gaps

To better compare women and men within a country, Figure 3 plots the male share on the x-axis and the female share on the y-axis, weighting each country by their population size. In the majority of the cases, the fraction of childless men is higher than the fraction of childless women. The gap widens markedly in high-income contexts, reaching 5 to 10 percentage points in Europe and the US. India and, to a smaller extent China, are characterized by very low levels of female childlessness combined with moderate levels of male childlessness. In a minority of countries, often located in MENA and South Asia, the male share is lower than the female share but the magnitude of the gap is relatively small.

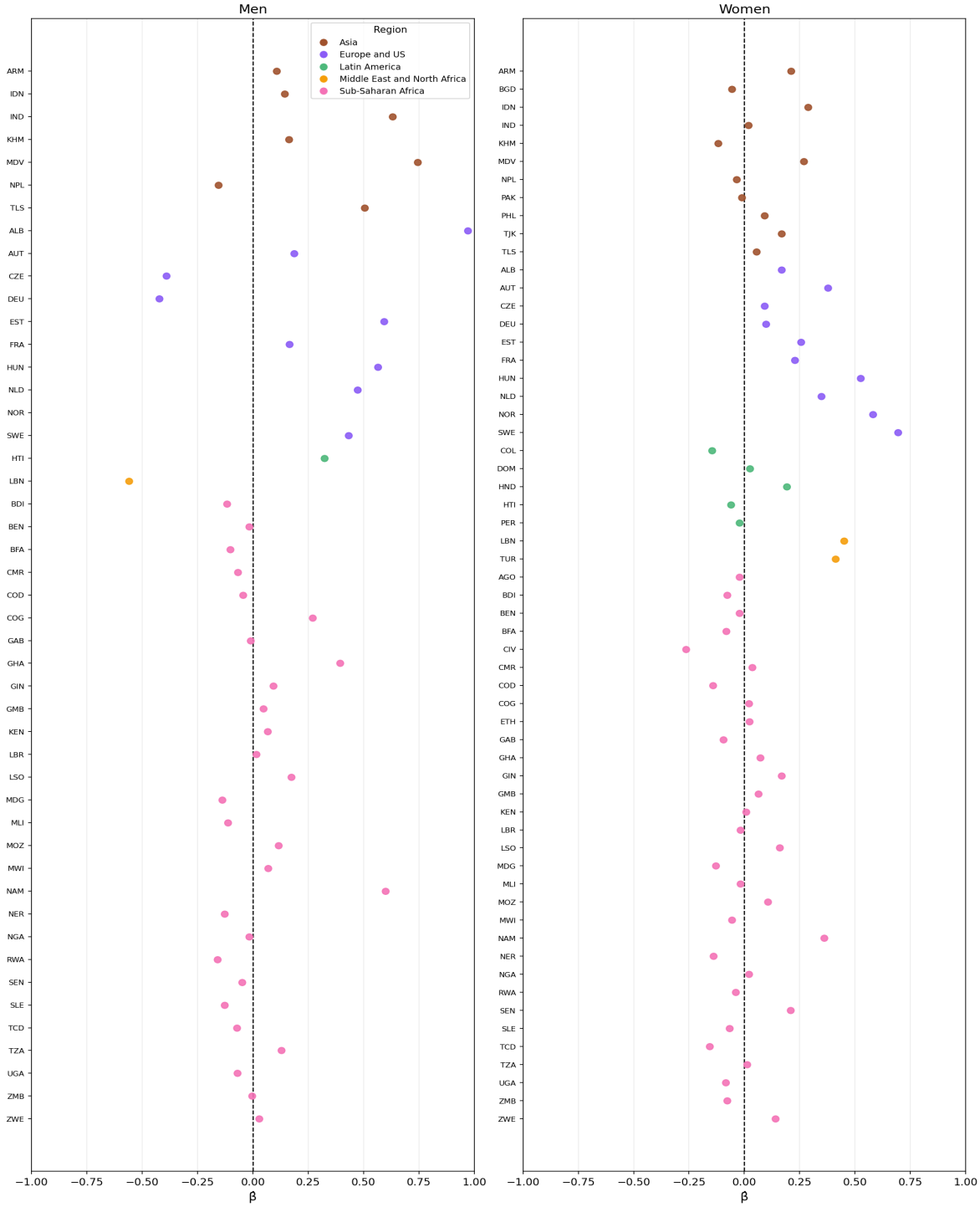
Figure 3: Gap between female and male childlessness



Notes: The x axis plots the share of childless men whereas the y axis plots the share of childless women for each country using the same data as in Figure 2. The size of the bubbles are proportional to each country's population and the color indicates the world region. Outliers Hong-Kong and Taiwan are not represented on the plot. Source: Table A1.

1.4 Trends

Figure 4: Trends in female and male childlessness, by country



Notes: Each dot shows the country-specific linear trend in childlessness among adults aged 40–49, estimated separately for men and women. The trend coefficient $\hat{\beta}_c$, interpreted as the annual change in percentage points, is obtained from a linear regression at the country-year level of the childlessness rate on country fixed effects and country-specific annual trends. Countries with fewer than two waves separated by at least four years are excluded. Countries are ordered by region and alphabetically by ISO code within region; color indicates world region. The dashed vertical line marks zero (no trend). A positive value indicates rising childlessness over time; a negative value indicates decline. Source: Table A1.

To look at trends, I keep countries with at least two survey waves that are at least four years apart and I estimate country-specific linear time trends. Specifically, I regress childlessness in a given country

in a given year on the year interacted with a country fixed effect, for each gender separately. Figure 4 plots the estimated annual trend country by country. Among men, positive trends are observed across most European countries and across South and Southeast Asia, ranging between 0.2 and 0.8 percentage points per year. In contrast, many Sub-Saharan African countries cluster around zero. Among women, the rise tends to be smaller in magnitude. Some countries display negative trends for men and/or women, but the magnitude is rarely larger than 0.2 percentage points per year.

Figure A1 in Appendix plots the distribution of these country-specific trends. The histogram confirms that male childlessness is changing more quickly than female childlessness. For women, the distribution is concentrated near zero with a median of +0.02 percentage points per year and few countries experiencing changes larger than 0.2 percentage points. For men, the distribution is more widespread, with a median of +0.06 percentage points per year and a fat right tail.

1.5 Correlates

Finally, I investigate how childlessness varies with socio-economic status proxied by education. In each country,[4] I use the median of the education distribution to partition individuals into the top half and the bottom half, and I compute the childlessness rate in each group. Then I estimate a weighted least squares regression at the country-education level, regressing the childlessness rate on the top-half indicator, including country fixed effects. I weigh each country according to their population size to ensure that the overall sample is representative.[5] The coefficient can be interpreted as the difference in the childlessness rate (in percentage points) between the above median and below median education groups. The sample is restricted to respondents aged 40–49 in the most recent available survey for each country, and regressions are estimated separately by sex.

Table 2: Correlation between education and childlessness, by gender and region

Specification	All	Asia	Europe and US	Latin America	MENA	Sub-Saharan Africa
Panel A: Men						
Above (country-specific) median education	−1.23	−1.02	−3.02**	0.48	−1.93	−0.47
	(1.12)	(1.89)	(1.44)	(0.42)	(1.42)	(0.41)
Mean dep. var.	9.7	8.1	22.8	6.8	6.4	3.9
N countries	99	18	25	8	12	36
Panel B: Women						
Above (country-specific) median education	1.77***	1.18***	3.46**	4.55***	0.10	1.61***
	(0.49)	(0.45)	(1.32)	(0.53)	(2.06)	(0.44)
Mean dep. var.	5.9	3.8	16.2	7.2	7.9	3.2
N countries	116	25	25	16	13	37

Notes: Each cell represents a separate regression and reports the estimated difference in childlessness rate between the groups above and below country and sex specific median level of education. Standard errors are in parentheses. The specification is aggregated at the country level, weighting each country according to their population size. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source: Table A1.

Results are reported in Table 2. The first column shows the average correlation in the whole sample and reveals opposite signs for men and women. Moving from the bottom half to the top half education group within a country is associated with a 1.8 percentage points *increase* in the fraction childless from a mean of 5.9% among women as opposed to a 1.2 percentage points *decrease* from a mean of 9.7% among men. Thus, childless women are disproportionately concentrated among the more educated, whereas childless men are disproportionately concentrated among the less educated. The female correlation is more precisely estimated than the male one. Results are then disaggregated by region. For women, the correlation is positive, large and significant everywhere, except in MENA.

[4] Except Latvia, for which I could not find the education variable in the pilot GGS survey.

[5] Alternative specifications without reweighting and/or using education terciles instead of the median give the same result: education is positively correlated with childlessness for women and negatively correlated for men.

For men, the correlation is strongly negative and significant in Europe and the US, more modest in MENA and Asia, and much closer to zero in SSA and Latin America.

Overall, the analysis reveals that the levels, trends and correlates of childlessness are different for men and women, and vary markedly across contexts. In the next section, I explore whether the structure of marriage markets can partly account for these patterns.

2 How marriage markets shape gender gaps in childlessness

2.1 Methodology

Choo and Siow (2006) propose an empirical model of the marriage market that can be used to explain how matches are formed given the population structure and people's preferences. In other words, the model rationalizes who marries whom given who is available and who likes whom. Separating out both forces allows us to study whether variations in matching patterns, e.g. assortative matching on education, are driven by variations in population structure, e.g. the relative supply of educated men and women, or by variations in preferences, e.g. the taste for homogamy. Importantly, we can build on this model to compute counterfactual scenarios predicting who would have married whom if one characteristic of the market had been different, holding all the other characteristics constant. In this section, I briefly explain how to infer the preferences based on observed matches and how to predict counterfactual matches.

Estimating preferences. Men and women are split into "types" (e.g. age, education). m_i is the number of men of type i and f_j is the number of women of type j who are available on the marriage market in a given period. Suppose that we observe who is matched with whom at the end of the period: μ_{ij} denotes the number of matches between a man of type i and a woman of type j; μ_{i0} and μ_{0j} are the number of men of type i and women of type j who remained unmatched, respectively. The key result in Choo and Siow (2006) is the following relationship:

$$\pi_{ij} = \ln\left(\frac{\mu_{ij}}{\sqrt{\mu_{i0}\mu_{0j}}}\right)$$

where π_{ij} is the *marital surplus*, defined as the per-capita systematic net gains to marriage (relative to remaining single) for couples consisting of i-type men and j-type women. The intuition behind this result is the following: if we observe many marriages between type i and type j, these unions must be valuable. However, it can also be that there are lots of men of type i and lots of women of type j. We need to "control for" the scale dimension in order to isolate the value dimension. We use the number of unmatched individuals of both types to do so. The value of a match is high if these matches are often observed relative to the frequency of types in the available population.[6]

Predicting counterfactuals. Once we have estimated the surplus π using observed matches μ, we can predict counterfactual matches μ' keeping π constant and changing population vectors to m' and f'. In practice, we use the algorithm developed by Qu, Galichon, Gao, and Ugander (2025) to solve:

$$\mu'_{i,j} = exp(\pi_{i,j}) \cdot \sqrt{\mu'_{i,0}} \cdot \sqrt{\mu'_{0,j}}$$

$$\text{subject to} \quad \mu'_{i,0} + \sum_j \mu'_{i,j} = m'_i \quad \text{and} \quad \mu'_{0,j} + \sum_i \mu'_{i,j} = f'_j$$

This allows us to answer questions such as: what would happen if the gender/age/education composition among available individuals was different? Who would match with whom and who would remain unmatched in this alternative world? Allowing for general equilibrium effects is an important contribution of this framework compared to previous quantitative models of the marriage market: matching outcomes between i-type men and j-type women are affected not only by the quantities of i-type men and j-type women but also by the quantities of men and women of all other types.

One limitation of the original model is to be static. It cannot address dynamic questions such as: what would have happened in the past 20 years if the sex ratio among cohorts entering the

[6] Technically, Choo and Siow (2006) derive this equation from a structural matching model with transferable utility and no search friction. The identification relies on assumptions regarding the distribution and the separability of unobserved heterogeneity in matching payoffs.

market during that period had been different? Or what will happen in the next 50 years if population growth slows down? Or what would happen if the rules governing remarriage changed? To answer these dynamic questions, we need to extend the original model to include the sequential entry of new cohorts, the potential re-entry of individuals already matched, and the accumulation of singles over time.

In the next sections, I present three applications studying the role of sex ratio, polygamy and divorce. These applications are described in detail in three research papers: *Left over or opting out? Squeeze, mismatch and surplus in Chinese marriage markets* (Rossi & Xiao, 2025), *Polygamy as a Ponzi scheme: how population growth shapes marriage markets in Africa* (Meier & Rossi, 2026), and *The serial monogamist and the involuntary celibate: how divorce shapes gender gaps in childlessness* (Rossi & Vallette, 2026). While the first paper is published, the other two are work-in-progress and the results presented here are susceptible to change during the revision process. The goal is to illustrate how the methodology can be used to study open questions rather than providing definitive answers to these questions.

2.2 In China: the role of imbalanced sex ratios

The Chinese marriage market is characterized by imbalanced sex ratios, monogamy, low divorce rates and very rare out-of-wedlock births. In these conditions, gender gaps in childlessness are mainly driven by gender gaps in being ever married. Using 2000 census data, we estimate that, among singles, the probability to marry within a year is 18% for women against 11% for men. As a consequence, men marry later than women and they are more likely to never marry. In the 40-49 age group, 1.5% of Chinese women and 5.5% of Chinese men are childless.

Since 2000, the marriage market has experienced three profound transformations. First, the sex ratio among incoming cohorts has deteriorated, leading to a marriage squeeze and fueling concerns about "leftover men". Second, education has risen faster for women than for men which, coupled with hypergamous preferences, has generated a shortage of suitable husbands for highly educated women who end up as "leftover women". Third, the perceived benefits of being married versus being single have decreased, prompting more individuals to "opt out" of marriage. As a result, marriage has declined. Among singles, the annual probability of marrying in 2019 was 9% for women and 6% for men, roughly half that of marrying in 1999.

We use our methodology to quantify the relative roles of each factor in a unified framework. We find that the deterioration of female-to-male ratio contributed to 13% of the decline for men, while *offsetting* 7% of the decline for women; in other words, men would have been more likely to marry and women less likely to marry if the sex ratio had not changed. The increase in the supply of educated people explains 45% of the decline in marriage for men and 55% of the decline for women, partly due to a mismatch between educated women and less-educated men. The decrease in the value of marriage (marital surplus) explains the rest. We conclude that imbalanced sex ratios in China contribute substantially to gender gaps in celibacy, and hence to gender gaps in childlessness.[7]

2.3 In Sub-Saharan Africa: the role of polygamy

In SSA, sex ratios are balanced and polygamy[8] is very prevalent: 5 to 35% of men have more than one wife depending on the country. Intuitively, we expect that many men can never marry because, every time a man takes a second wife, another man must remain single if there are as many men as women. This intuition is at odds with the very low levels of male childlessness in SSA and the weak correlation with education documented above.

In fact, the fraction of men who never marry has historically been low in Sub-Saharan African markets. This is possible because men marry younger women and the population is growing rapidly; once we consider the relevant age groups, there are more women than men on the marriage market. Just like in a Ponzi scheme, all men can marry and some men can marry twice as long as the bottom

[7] Unfortunately, we cannot compute the fraction of childless men and women in 2019 because the 2020 census data is not publicly available yet. For the analysis, we use aggregate statistics: they are enough to estimate the model but not enough to estimate childlessness.

[8] Polygamy is a marriage that includes more than two partners. It encompasses polygyny, in which a man has several wives, and polyandry, in which a woman has several husbands. I use the term polygamy to refer to the former situation, which is by far the most practiced form of polygamy.

of the population pyramid is constantly expanding. However, population growth in SSA is projected to slow down. The demographic conditions necessary to sustain high levels of polygamy while ensuring that all men eventually marry are therefore less likely to hold in the future.

We use our methodology to predict how marriage markets will respond to the decline in population growth: will polygamy disappear or will male celibacy explode? In theory, we find that the response (i) is stronger in markets with a high taste for age hypergamy and (ii) affects singles more than polygamists in markets with a low marital surplus. We provide an empirical application in Senegal, where we have rich data on marital trajectories. We consider two scenarios: what would happen by 2080 if the Senegalese population grows according to the UN projections? And what would happen in a world with no population growth at all? We predict that the share of never-married men, historically low at 3%, would double in the projected-growth scenario and quadruple in the zero-growth scenario. Polygamy would decline but would not disappear. Therefore, even though very low levels of male childlessness could coexist with polygamy in the past, this is unlikely to be sustainable if population growth slows down in SSA.

2.4 In France: the role of divorce and remarriage

In Western countries, gender gaps in childlessness have become remarkably salient over the past 50 years. This evolution coincides with the emergence of "serial monogamy", meaning that divorces and remarriages have become more frequent in these markets. In France, childlessness used to be similar for men and women, around 13% for cohorts born in 1945. While the fraction has barely changed for women, it has increased substantially for men, reaching 21% for the most recent cohort. This increase is concentrated at the bottom of the education distribution. Since 1975, divorce laws have been liberalized, with asymmetric effects on men and women: divorced men are more likely to remarry than divorced women, and they remarry (much) younger wives. In our data, 30% of men remarry versus 12% of women; the age gap is larger than 10 years in one third of male remarriages.

We use our methodology to investigate whether the liberalization of divorce can exacerbate the gender gap in childlessness. In theory, allowing divorcees to reenter the market has two opposite effects on younger generations: there are more potential reproductive partners available, but also more potential competitors. The *choice effect* dominates for young women while the *competition effect* dominates for young men under two conditions: (i) the taste for age hypergamy is sufficiently strong and (ii) female fertility decreases sufficiently quickly with age. This model can theoretically explain how the liberalization of divorce may lead to a polarization among men – between those who have children with multiple women and those who have none at all – whereas such a polarization is not observed among women. It can also explain why socioeconomic status is increasingly strongly associated with childlessness among men. Quantitatively, we estimate that the rise of divorce in the 1970s-80s accounts for a 1 percentage point increase in the childlessness gender gap. This is sizable but not enough to fully explain the trend observed in France.

3 Conclusion

This article provides a dataset and a methodology to study childlessness in the world. These tools should open the way to a more systematic analysis across countries and over time, a better understanding of the causes, and a more accurate forecast of the future. I present three applications illustrating the potential of quantitative models of the marriage market to push the research frontier. The conclusion is that individual childlessness is shaped by aggregate demographic forces, such as sex ratio and population growth, as well as marital institutions, such as polygamy and divorce. This result confirms that childlessness is at least partly circumstantial in the sense that some individuals would be able to find a reproductive partner in one marriage market but not in another. Understanding who gains and who loses in different markets is becoming a pressing question as childlessness makes the headlines. The possibility to form a family is a crucial dimension of welfare; inequalities between men and women, but also across men and across women, are likely to be hotly debated in the near future.

References

Case, A., & Deaton, A. (2017). Mortality and morbidity in the 21st century. *Brookings Papers on Economic Activity*, *2017*, 397.

Choo, E., & Siow, A. (2006). Who marries whom and why. *Journal of Political Economy*, *114*(1), 175–201.

Geruso, M., & Spears, D. (2025). *Childless or child-fewer? childlessness and parity progression where fertility is below replacement* (Tech. Rep.). National Bureau of Economic Research.

Hudson, V. M., & Den Boer, A. (2002). A surplus of men, a deficit of peace: Security and sex ratios in asia's largest states. *International Security*, *26*(4), 5–38.

Meier, L., & Rossi, P. (2026). *Polygamy as a ponzi scheme: how population growth shapes marriage markets in africa.* (Mimeo)

Qu, Z., Galichon, A., Gao, W., & Ugander, J. (2025). *On sinkhorn's algorithm and choice modeling.* Retrieved from https://arxiv.org/abs/2310.00260

Rossi, P. (2026). *Data and code for: Childlessness and the marriage market.* openICPSR. doi: 10.3886/E250195V1

Rossi, P., & Vallette, A. (2026). *The serial monogamist and the involuntary celibate: how divorce shapes gender gaps in childlessness.* (Mimeo)

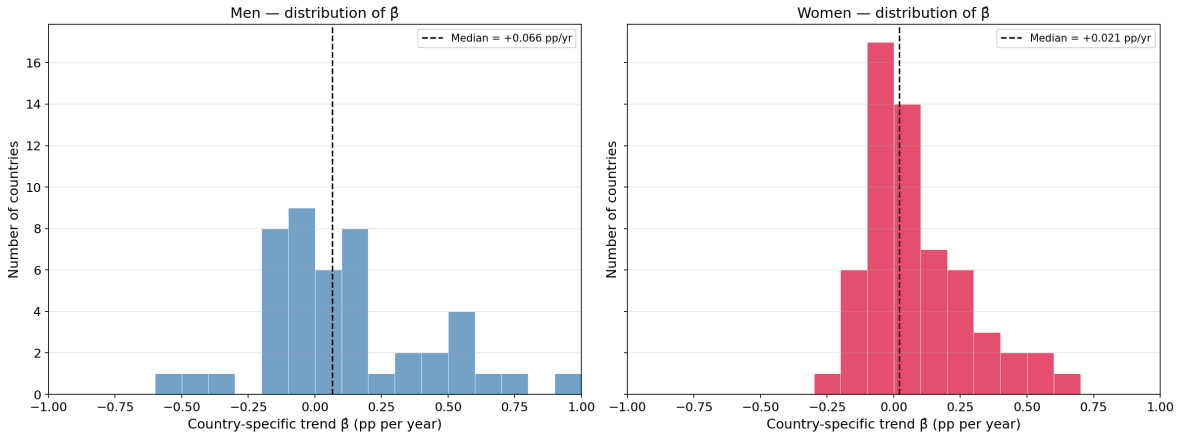
Rossi, P., & Xiao, Y. (2025). Left over or opting out? squeeze, mismatch and surplus in chinese marriage markets. *Journal of Development Economics*, 103629.

Schoumaker, B. (2019). Male fertility around the world and over time: How different is it from female fertility? *Population and Development Review*, 459–487.

Skirbekk, V. (2022). The new have-nots: childlessness in the twenty-first century. In *Decline and prosper! changing global birth rates and the advantages of fewer children* (pp. 105–140). Springer.

Appendix

Figure A1: Distribution of country-specific linear trends in childlessness



Notes: The histogram plots the distribution of country-specific linear trends estimated in Figure 4 for men (left panel) and women (right panel). Bin width is 0.1 pp per year. The dashed black line marks the cross-country median.

Table A1: Childlessness by country, survey year, sex and education level (ages 40–49)

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Afghanistan	2015	1.7	1.3	2.2	3,078	2.8	2.8	2.3	6,317	7.0
Albania	2009	3.8	3.5	6.4	1,046	3.8	3.2	4.5	2,300	2.8
Albania	2017	11.6	11.2	12.0	1,287	5.2	4.3	5.9	3,403	2.3
Algeria	2020	14.2	13.6	15.7	144	4.7	4.6	5.2	319	–
Algeria	2022	9.8	12.8	5.0	157	6.2	3.5	12.3	181	–
Angola	2006	–	–	–	–	2.8	4.3	1.8	478	6.6
Angola	2015	1.9	2.5	1.1	890	2.6	3.4	1.7	2,100	6.0
Armenia	2005	6.1	5.1	8.8	435	6.5	6.0	8.8	2,024	2.5
Armenia	2016	7.3	6.2	8.6	675	8.8	6.3	11.1	1,496	2.2
Austria	2008	20.1	20.7	18.7	528	14.8	12.9	19.0	789	1.9
Austria	2012	22.9	22.3	24.0	652	15.2	11.5	21.7	1,029	1.9
Austria	2022	23.2	22.1	25.0	750	19.8	18.3	21.6	1,156	1.6
Azerbaijan	2006	5.4	6.7	3.9	626	9.4	10.6	7.4	2,327	2.7
Bangladesh	2007	–	–	–	–	2.3	2.7	1.6	2,282	4.6
Bangladesh	2017	–	–	–	–	1.7	1.8	1.6	4,675	3.7
Belarus	2017	11.8	11.7	11.8	814	7.2	6.8	7.7	1,005	1.7
Belgium	2008	15.9	15.9	15.7	715	11.1	10.9	11.5	837	2.1
Benin	2006	2.3	2.0	2.6	838	1.6	1.0	3.9	3,049	6.4
Benin	2018	2.1	1.8	2.4	1,214	1.3	0.8	3.2	2,606	6.0
Bolivia	2008	6.8	5.6	8.1	1,081	4.2	3.1	5.7	3,403	4.9
Brazil	1996	4.7	4.4	5.2	491	8.3	5.9	11.4	2,547	3.7
Bulgaria	2004	12.6	12.2	15.0	1,024	6.9	5.8	8.7	1,297	1.8
Bulgaria	2007	12.9	13.5	10.7	799	7.9	5.8	12.4	1,135	1.8
Burkina Faso	2003	2.2	2.1	2.7	535	1.4	1.1	4.3	2,334	6.9
Burkina Faso	2010	1.5	1.0	3.4	1,322	0.8	0.5	2.7	2,986	6.8
Burundi	2010	2.9	2.3	3.7	653	3.4	3.6	2.9	1,429	6.6

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Burundi	2016	2.2	2.0	2.4	1,099	3.0	3.4	1.9	2,744	6.2
Cambodia	2005	1.6	1.2	1.9	1,375	8.0	7.5	8.7	3,771	4.9
Cambodia	2014	3.0	2.9	3.1	1,151	7.0	6.9	7.1	3,896	3.9
Cameroon	2011	3.5	3.6	3.5	1,082	3.2	4.1	2.0	2,461	5.9
Cameroon	2018	3.1	4.1	2.0	984	3.4	3.4	3.4	2,001	5.4
Central African Republic	1994	9.1	12.7	4.6	225	8.1	9.1	3.9	886	5.7
Chad	2004	2.0	0.2	4.8	296	2.7	3.1	0.3	1,043	7.1
Chad	2015	1.2	1.1	1.3	930	1.0	1.1	0.7	2,893	7.6
China	2000	5.5	6.5	2.3	737,389	1.5	1.4	1.7	793,716	2.2
Colombia	2005	–	–	–	–	7.6	4.3	10.8	8,693	3.1
Colombia	2015	13.8	14.5	13.3	6,162	6.1	3.0	8.7	8,588	2.7
Comoros	2012	8.4	4.4	13.5	344	5.5	4.1	7.6	757	5.3
Congo	2005	2.2	3.5	0.6	494	2.1	2.0	2.2	979	5.3
Congo	2011	3.8	4.3	3.4	1,029	2.2	1.2	3.1	1,927	5.0
Congo, DRC	2007	2.8	1.0	5.3	783	3.4	3.4	3.4	1,586	6.4
Congo, DRC	2013	2.6	3.7	1.2	1,478	2.6	2.2	2.9	2,918	6.4
Cote d'Ivoire	2005	–	–	–	–	4.8	4.5	5.3	1,554	5.7
Cote d'Ivoire	2012	4.6	3.9	5.1	827	2.9	2.5	3.7	1,594	5.8
Croatia	2023	24.6	25.1	23.1	967	16.8	13.8	23.0	1,195	1.6
Czech Rep.	2005	22.8	23.3	21.1	791	9.6	9.3	11.2	878	1.8
Czech Rep.	2008	25.3	26.4	19.1	222	8.1	8.1	8.1	295	1.8
Czech Rep.	2022	14.9	14.3	16.4	608	12.8	13.0	12.5	888	1.8
Czech Rep.	2025	18.5	19.0	17.2	385	9.0	4.3	0.0	639	1.9
Denmark	2021	27.3	28.5	20.5	1,298	21.6	22.7	14.7	1,405	1.7
Dominican Republic	2002	6.4	9.2	4.4	467	4.4	3.0	5.5	4,604	3.8
Dominican Republic	2013	–	–	–	–	4.7	3.2	6.2	2,074	3.2
Ecuador	1987	–	–	–	–	5.1	4.5	5.7	687	5.7
Egypt	2022	4.6	5.5	1.4	249	6.7	7.8	5.5	226	–
El Salvador	1985	–	–	–	–	4.3	3.7	4.8	842	6.1
Estonia	2005	10.6	13.7	7.0	541	6.3	6.1	6.6	935	2.1
Estonia	2021	20.4	22.2	16.1	1,027	12.0	11.2	12.6	1,299	1.9
Estonia	2025	22.4	41.8	8.6	709	10.6	3.7	10.2	822	2.0
Ethiopia	1997	2.6	2.4	2.9	916	2.2	1.8	5.1	2,261	6.9
Ethiopia	2011	–	–	–	–	2.5	1.8	4.3	1,252	6.5
Finland	2021	29.9	32.6	16.3	320	24.4	24.4	23.5	430	1.6
France	2005	18.8	–	–	834	11.2	–	–	1,062	2.1
France	2008	16.6	16.8	15.8	587	12.0	10.8	14.9	757	2.1
France	2011	19.9	16.8	23.5	538	13.0	13.4	12.4	737	1.9
France	2024	21.0	21.7	18.9	1,134	15.6	15.6	15.2	1,405	1.8
Gabon	2000	4.2	5.2	3.2	313	4.7	5.4	3.8	861	6.0
Gabon	2012	4.1	5.2	3.4	1,074	3.5	3.0	3.9	1,611	5.0
Georgia	2006	10.1	9.7	11.2	925	11.3	9.7	15.5	1,162	2.0
Georgia	2009	10.5	9.0	14.4	767	11.2	7.6	20.4	1,006	2.0
Germany	2005	42.5	44.5	38.2	951	24.4	25.2	22.3	1,240	1.4
Germany	2008	26.7	24.7	30.7	318	11.8	10.2	14.5	524	1.9
Germany	2021	30.7	31.5	29.5	2,892	21.6	21.8	18.1	3,568	1.6
Ghana	2008	3.2	2.9	4.7	759	2.1	0.8	3.2	920	5.2
Ghana	2014	5.6	4.9	6.2	800	2.5	1.9	3.0	1,902	4.8
Guatemala	2015	5.7	5.5	5.9	1,704	4.7	3.7	6.1	4,662	4.7
Guinea	2005	2.8	2.4	3.5	594	2.6	2.6	2.4	1,638	6.4
Guinea	2018	4.0	3.3	5.4	755	4.8	4.5	7.4	1,926	5.1

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Guyana	2009	11.6	11.8	11.5	876	7.2	7.2	7.1	1,189	3.4
Haiti	2006	4.3	4.3	4.3	748	5.1	2.7	8.6	1,924	5.5
Haiti	2017	7.8	8.0	7.8	1,398	4.5	2.1	7.0	2,525	4.5
Honduras	2006	–	–	–	–	3.3	2.2	4.4	3,496	5.1
Honduras	2012	7.5	8.6	6.4	1,263	4.5	3.1	5.5	4,007	4.4
Hong Kong	2023	34.4	34.6	33.2	477	26.2	22.7	37.0	631	1.1
Hungary	2004	15.8	18.5	10.9	1,051	6.5	5.8	9.4	1,300	2.0
Hungary	2008	16.6	17.7	11.5	740	5.8	5.3	6.8	1,017	2.4
Hungary	2012	20.3	20.3	20.5	570	10.7	8.1	15.2	800	1.9
India	2006	4.0	3.8	4.2	14,335	3.3	2.9	4.0	22,945	4.0
India	2019	12.2	10.9	13.5	21,671	3.6	3.1	4.0	165,439	3.0
Indonesia	2007	2.0	2.4	1.6	2,768	2.9	2.8	3.0	9,440	3.6
Indonesia	2017	3.5	3.6	3.3	3,594	5.8	4.4	8.5	13,275	2.8
Iraq	2021	9.5	9.5	9.6	78	1.2	1.9	0.0	90	–
Iraq	2022	13.3	14.6	11.5	149	10.6	8.6	12.6	193	–
Iraq	2024	6.6	7.0	5.8	159	8.4	6.2	10.9	207	–
Italy	2003	27.3	38.2	25.2	1,152	17.8	12.5	17.6	1,194	1.5
Japan	2005	16.7	19.5	14.1	811	11.6	10.6	13.1	977	–
Jordan	2020	3.1	2.8	4.4	366	3.1	3.7	1.7	274	–
Jordan	2022	6.3	6.2	6.4	247	2.2	3.1	0.0	239	–
Jordan	2023	6.5	6.4	6.5	227	4.2	4.1	4.3	267	–
Kazakhstan	2018	7.0	6.8	7.2	904	7.3	6.5	8.7	1,202	2.5
Kenya	2003	2.5	2.1	3.1	520	2.2	2.1	2.3	1,290	6.0
Kenya	2014	3.2	4.0	2.4	2,093	2.3	1.9	2.7	5,337	5.0
Kuwait	2022	1.0	1.1	0.0	105	2.5	1.7	13.2	113	–
Kuwait	2024	4.9	5.8	0.0	109	4.9	4.5	7.2	116	–
Kyrgyzstan	2012	2.4	2.4	2.4	569	3.5	2.9	4.3	1,825	3.4
Latvia	2018	29.8	–	–	124	17.6	–	–	193	1.5
Lebanon	2020	7.9	8.1	7.3	253	6.3	7.0	4.8	282	–
Lebanon	2021	5.0	4.5	5.8	194	5.9	5.4	7.4	228	–
Lebanon	2024	5.0	6.0	3.0	202	7.8	7.1	10.1	236	–
Lesotho	2004	8.9	8.2	9.7	336	2.5	2.5	2.5	1,305	4.7
Lesotho	2014	10.7	11.8	9.7	388	4.1	2.7	6.6	1,072	3.8
Liberia	2007	1.7	2.4	0.9	1,282	1.1	1.5	0.1	1,275	6.2
Liberia	2019	1.9	2.8	1.1	850	0.9	0.7	1.1	1,584	5.4
Libya	2020	6.4	6.8	6.0	298	8.7	7.8	10.2	193	–
Libya	2022	3.3	6.0	0.6	171	9.6	9.2	10.0	175	–
Lithuania	2006	12.0	14.8	9.1	904	8.9	8.1	11.0	915	1.8
Madagascar	2009	3.6	3.8	3.4	1,428	4.8	4.2	5.8	3,144	5.5
Madagascar	2021	2.0	1.9	2.0	1,468	3.2	2.4	4.6	3,399	4.9
Malawi	2004	1.7	3.1	0.3	474	1.7	2.3	1.1	1,710	6.5
Malawi	2015	2.4	2.1	3.0	1,071	1.1	1.2	0.8	3,583	6.0
Maldives	2009	2.1	2.3	1.6	461	1.8	1.6	2.1	1,740	5.1
Maldives	2017	8.1	7.5	9.2	883	4.0	3.5	4.3	1,623	3.5
Mali	2006	3.4	1.6	7.5	781	2.5	2.4	3.6	2,535	7.0
Mali	2018	2.1	2.1	2.0	860	2.3	2.3	2.3	1,525	6.6
Mauritania	2022	8.7	8.5	8.8	240	2.5	2.7	2.2	253	–
Mauritania	2024	7.0	5.2	9.9	119	9.4	5.0	13.8	108	–
Mexico	1987	–	–	–	–	7.0	5.6	9.2	1,487	5.8
Moldova	2020	21.4	22.2	19.2	580	10.2	11.1	8.5	825	1.9
Morocco	2020	8.7	11.6	1.6	207	3.2	1.0	9.9	286	–

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
Morocco	2022	6.2	4.6	9.4	178	6.6	6.5	6.9	215	–
Morocco	2023	8.3	6.6	9.9	177	9.0	12.6	2.1	184	–
Mozambique	2003	2.0	3.0	0.3	424	3.2	3.8	2.4	2,071	6.1
Mozambique	2011	2.9	4.0	1.2	531	4.1	3.7	4.9	2,206	5.5
Myanmar	2016	11.7	9.7	14.5	1,247	17.6	14.4	24.6	3,388	3.0
Namibia	2007	8.7	12.2	5.2	603	4.0	2.6	5.6	1,664	4.4
Namibia	2013	12.3	12.1	12.5	713	6.2	3.6	9.2	1,696	3.7
Nepal	2007	2.3	3.3	1.3	821	3.3	3.1	4.9	1,964	4.9
Nepal	2017	0.7	0.4	1.0	896	3.0	2.0	5.1	2,467	3.8
Netherlands	2003	21.2	20.0	22.8	771	15.7	12.4	23.1	1,027	2.0
Netherlands	2023	30.7	34.9	24.8	687	22.6	22.4	23.3	1,018	1.7
Nicaragua	2001	–	–	–	–	3.3	1.7	4.7	2,245	5.3
Niger	2006	2.6	2.5	3.2	681	2.3	2.3	2.5	1,554	7.8
Niger	2012	1.9	1.0	4.7	803	1.5	1.2	3.5	1,744	7.9
Nigeria	2008	3.9	2.9	5.1	2,598	3.0	2.6	3.3	5,948	6.5
Nigeria	2018	3.7	3.8	3.6	2,683	3.2	2.0	5.5	7,948	6.1
Norway	2020	17.9	18.4	15.6	650	13.3	12.9	14.1	788	1.9
Norway	2024	22.1	16.7	1.4	445	15.6	11.9	12.0	586	1.8
Pakistan	2006	–	–	–	–	3.5	3.7	3.1	2,510	6.1
Pakistan	2018	4.5	5.7	2.9	1,176	3.4	3.8	2.7	3,383	5.2
Palestine	2021	2.1	3.2	0.0	170	3.5	2.5	4.1	194	–
Palestine	2023	3.5	2.0	6.0	119	6.0	4.8	9.7	133	–
Paraguay	1990	–	–	–	–	5.3	3.0	7.5	1,040	5.2
Peru	2008	–	–	–	–	6.0	2.8	8.4	9,449	3.8
Peru	2012	–	–	–	–	5.9	3.0	8.5	5,672	3.5
Philippines	2008	–	–	–	–	8.5	6.0	13.8	2,974	4.0
Philippines	2017	–	–	–	–	9.3	8.0	12.2	5,776	3.4
Poland	2010	18.1	18.3	17.0	1,225	9.1	7.6	13.1	1,527	2.0
Romania	2005	15.7	15.9	14.8	1,046	7.7	7.2	10.6	950	2.0
Russia	2004	5.5	6.5	4.0	880	4.3	4.3	0.0	1,462	2.0
Russia	2007	12.2	14.0	9.0	570	12.0	11.5	14.1	1,091	1.8
Rwanda	2010	4.3	3.9	4.8	840	3.1	2.4	4.1	2,257	5.9
Rwanda	2020	2.7	2.3	3.1	1,010	2.7	2.7	2.8	2,717	5.0
Sao Tome & Principe	2008	6.8	10.5	3.8	379	1.1	0.7	1.6	506	5.8
Senegal	2011	9.1	4.6	15.3	696	5.5	3.0	13.1	2,313	5.7
Senegal	2019	8.8	5.4	12.1	513	7.2	5.1	10.6	1,267	5.3
Sierra Leone	2008	3.2	3.7	2.5	666	2.5	2.5	2.3	1,178	5.5
Sierra Leone	2019	1.8	1.1	2.6	1,327	1.7	1.6	2.3	2,679	5.2
South Africa	2016	11.9	14.0	10.1	605	5.8	5.0	6.6	1,877	2.9
Sri Lanka	1987	–	–	–	–	3.0	2.7	3.5	1,559	4.6
Sudan	2022	8.7	8.9	8.4	167	12.0	12.1	11.6	159	–
Swaziland	2006	3.5	4.7	2.2	538	3.9	3.9	4.0	825	5.3
Sweden	2012	17.9	19.1	15.4	859	10.2	11.1	9.1	968	2.3
Sweden	2021	21.8	21.9	21.0	966	16.4	17.5	11.3	1,172	1.6
Taiwan	2024	40.0	40.5	37.0	869	32.4	30.4	41.9	1,012	1.3
Tajikistan	2012	–	–	–	–	2.7	2.9	2.0	1,932	4.5
Tajikistan	2017	–	–	–	–	3.6	3.2	3.7	2,176	3.8
Tanzania	2004	2.2	2.5	0.1	448	1.9	2.3	1.5	1,655	6.4
Tanzania	2015	3.6	3.4	4.8	621	2.0	2.0	2.0	2,382	5.7
Thailand	1987	–	–	–	–	2.5	2.0	8.2	1,652	4.7
The Gambia	2013	5.7	1.1	11.1	535	2.5	2.2	3.7	1,336	6.0

continued on next page

Table A1 continued from previous page

		Men				Women				
		% childless, by edu				% childless, by edu				
Country	**Year**	**All**	**Low**	**High**	**N**	**All**	**Low**	**High**	**N**	**Avg. no. kids/woman**
The Gambia	2020	6.1	4.7	7.0	725	3.0	2.2	4.3	1,791	5.8
Timor Leste	2009	5.4	5.1	5.8	868	6.6	7.2	5.6	2,494	5.8
Timor Leste	2016	8.9	10.3	7.2	935	7.0	6.7	7.3	2,545	5.0
Togo	2014	4.4	3.9	5.0	784	2.4	1.3	3.6	1,751	5.3
Trinidad & Tobago	1987	–	–	–	–	6.9	3.8	10.5	649	4.3
Tunisia	2020	9.0	9.0	5.7	260	12.3	12.2	12.7	275	–
Tunisia	2021	7.2	6.6	8.0	201	3.7	4.8	2.1	223	–
Tunisia	2023	10.1	7.6	19.3	175	8.1	7.2	9.0	245	–
Turkey	2004	–	–	–	–	2.6	2.6	2.6	2,323	3.6
Turkey	2013	–	–	–	–	6.3	4.4	10.9	2,356	2.9
Uganda	2006	2.1	3.0	1.3	380	2.9	2.7	3.0	1,324	7.3
Uganda	2016	1.4	2.5	0.2	855	2.0	1.7	2.4	2,805	6.8
Ukraine	2007	9.8	12.5	6.8	904	5.1	4.4	5.9	2,028	1.7
United Kingdom	2023	31.9	33.1	27.1	707	24.5	23.1	29.7	1,114	1.6
United States	2021	27.2	27.0	27.5	1,589	18.6	15.5	22.1	1,622	1.9
Uruguay	2022	27.2	26.3	28.4	445	15.3	12.2	18.0	824	1.8
Uzbekistan	1996	–	–	–	–	2.3	1.8	3.2	761	4.6
Vietnam	2002	–	–	–	–	1.5	1.4	1.6	1,877	3.6
Zambia	2007	2.8	3.2	2.4	868	3.0	2.6	3.4	995	6.5
Zambia	2018	2.8	3.2	2.3	1,989	2.1	1.1	3.2	2,232	5.9
Zimbabwe	2005	3.2	3.5	2.9	878	2.5	2.8	2.1	1,338	5.2
Zimbabwe	2015	3.5	3.4	3.6	1,375	3.9	3.1	4.8	1,561	4.2

Notes: The table shows the share of childless men and women, for high, low education and the combined sample. High and low education categories are determined by splitting the total sample of ages 40–49 for each gender into two groups based on the median level of education. The median value is gender-, country-, and year-specific. Respondents whose education level is greater than or equal to the median are classified as high education, and those with below-median education are classified as low education. Italy is an exception, since the distribution of education values did not allow for the creation of two groups, as the median level is the maximum education value. Thus, for Italy, two groups are created instead: less than or equal to the median, or strictly above the median. N is the size of the 40–49 age group, used as the denominator for each gender. Avg. no. kids/woman is the total number of children divided by the total number of women in the 40–49 age group. Source: See Table 1 for details about each country's data source.

CREST
CENTER FOR RESEARCH
IN ECONOMICS AND STATISTICS

CREST
Center for Research in Economics and Statistics
UMR 9194

5 Avenue Henry Le Chatelier
TSA 96642
91764 Palaiseau Cedex
FRANCE

Phone: +33 (0)1 70 26 67 00
Email: info@crest.science
https://crest.science/

The Center for Research in Economics and Statistics (CREST) is a leading French scientific institution for advanced research on quantitative methods applied to the social sciences.

CREST is a joint interdisciplinary unit of research and faculty members of CNRS, ENSAE Paris, ENSAI and the Economics Department of Ecole Polytechnique. Its activities are located physically in the ENSAE Paris building on the Palaiseau campus of Institut Polytechnique de Paris and secondarily on the Ker-Lann campus of ENSAI Rennes.

cnrs

GENES Groupe des écoles nationales d'économie et statistique