

# Fertility Rates in High-Income Countries over the 20th Century: A Cohort Perspective

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## Abstract

This chapter explores the transition to below-replacement fertility in high-income countries over the 20th and early 21st centuries from a cohort perspective. After describing changes in total fertility rates (TFR) in high-income countries, we use newly combined administrative microdata to examine cohort fertility rates in the United States, Finland, the Netherlands, and Spain—four countries capturing a range of fertility transitions in terms of completed family size, childlessness, and the timing of childbearing. We show that period and cohort fertility align closely over much of the 20th century but differ when the timing of childbearing changes. Because declines in the TFR since 2007 have been driven by delayed childbearing, the TFR provides a misleading estimate of completed fertility today. We also show that, among cohorts old enough to have completed their childbearing, the emergence of a two-child norm is universal across the countries we examine, with a declining transition from second to third birth as the primary mechanism explaining recent fertility declines. In the last 20 years, Spain has begun to show early signs of transitioning toward a one-child norm, although it is too soon to draw firm conclusions. Across all countries we study, the long-run decline in completed fertility is driven by the disappearance of larger (3+ child) families, not rising childlessness.

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## I. Introduction

The transition to below-replacement fertility ranks among the most universal and consequential demographic transformations of the last century. Across high-income countries, women today have far fewer children than their grandmothers did—a shift with profound implications for the long-run sustainability of human populations, population aging, and time devoted to parenting and work.

This chapter documents the evolution of fertility in high-income countries over the 20th and early 21st century, combining both period and cohort perspectives to understand common and diverging experiences. Similar to other recent overviews of fertility rates (Doepke et al. 2023; Bailey 2025; Kearney and Levine 2025), we summarize changes over time using the total fertility rate (TFR) and age-specific fertility rates from national vital statistics and the Human Fertility Database (2026). We complement these standard statistics with new measures of completed childbearing, childlessness, and the timing of childbearing constructed from restricted-access population registries and retrospective census and survey reports for four countries representing the different experiences with fertility transition in high-income countries: Finland, the Netherlands, Spain, and the United States.

These new cohort measures allow us to characterize changes in the timing of childbearing and completed childbearing separately to understand whether falling TFRs across much of Europe and the United States today foretell falling rates of completed childbearing. They also reveal the extent to which lower fertility rates represent declining rates of motherhood versus smaller family sizes among mothers. The answers to these questions are important for scientific reasons and for policymakers grappling with the social and economic consequences of depopulation. Understanding the historical arc of the 20th- and 21st-century fertility transitions, and the diversity of experiences within it, allows a better diagnosis of current experience and provides information to improve fertility forecasts going forward.

To place our cohort measures in context, we begin by describing the experiences in the transition to below-replacement *period* fertility rates across a broad set of high-income countries.<sup>1</sup> We group these

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<sup>1</sup> In order to focus the chapter, we select high-income countries using the World Bank (2000) definition. This excludes Eastern Europe and some other countries that have transitioned to high-income status since 2000. We also exclude the Middle East and Caribbean, as well as smaller countries from the figures.

countries by geography and according to common characteristics of their modern fertility transitions, resulting in four groups: Anglophone, Northern Europe, (continental) Western Europe, and Southern Europe and Japan. Anglophone, Northern, and Western European countries experienced sharp fertility declines in the 1960s and 1970s, with a handful of laggards (e.g., Ireland and Norway). Southern European countries underwent a more compressed transition to very low fertility beginning in the mid-1970s. Japan's transition began earlier, with fertility falling sharply in the 1950s, following the legalization of abortion in 1948. Although multiple economic, social, and policy factors drive changes in fertility across place, the onset of the fertility decline to below replacement levels begins around the time that modern medical contraception was approved (e.g., the Pill or the intrauterine device, IUD) or abortion was legalized, whichever came first.

Within these broad groupings, we further examine completed fertility rates and changes in fertility timing in four countries. Although the TFR and completed childbearing series track closely, we show that, during the post-World War II period, earlier childbearing pushed the TFR well above completed family size in all countries. However, the TFR declined in the 1960s through the 1980s, driven by delayed childbearing, which overstated declines in completed fertility. That is, when the timing of childbearing changes, the gap between the TFR and cohort fertility measures leads the headline TFR figure—widely cited in policy debates and press coverage—to misrepresent completed family sizes among women who have completed childbearing. Alarm about sub-replacement fertility in the United States, and about very low fertility in the Netherlands and Finland, is at least partly a statistical artifact: completed family sizes among recent cohorts reaching their forties remain meaningfully above what current TFRs imply. In contrast, Spain is a context where period rates fell to low levels in the 1980s and have remained persistently low for the last thirty years, so completed childbearing and period rates are closely aligned.

The availability of microdata for four countries allows us to unpack these trends to describe how the modern fertility transition was shaped by changes in the distribution of completed childbearing, including changes in childlessness and progression to three or more children. Across Finland, the

Netherlands, Spain, and the United States, we document that the modern fertility transition is associated with a universal consolidation around the two-child family. Two children is now the modal outcome in all four countries. For the birth cohort of 1980 (the most recent to have completed its childbearing years), 34 percent of women in the U.S., 37 percent in Finland, 39 percent in Spain, and 45 percent of women in the Netherlands have exactly two children. This convergence was achieved primarily through sharp declines in the share of women having 3 or more children, rather than through increasing childlessness. Today, rates of childlessness are similar to those among cohorts born in the early 20th century, when women averaged 2.5 to 3.5 children over their lifetimes. Together, these facts imply that the decline in 3+ child families is a key driver of the shifting demographic landscape over the last thirty years in all countries.

Another finding is that the share of women having two or more children has remained stable over the last three decades in Finland, the Netherlands, and the U.S. at around 61–64 percent. Whether the relative stability of completed cohort fertility will persist for women now passing through their reproductive years remains an open question to be answered once today’s young women reach their forties. In Spain, however, the share having two or more children has been falling for the last 30 years, reaching 49 percent for the most recent cohorts. This trend suggests that the average number of children at completion may continue to drop toward one.

Delay in childbearing may be related to these trends, but not deterministically so. Since 2007, most developed countries have seen sharply declining childbearing among women in their late twenties, raising concerns in the U.S. that these delays will result in fewer children at completion (Kearney and Levine 2025). Cross-country comparisons in age-specific fertility rates and age at first motherhood are instructive in understanding the implications of these patterns. The timing of childbirth has long differed across countries, with substantially more women in the U.S. giving birth before age 25 than in other developed countries. For the most recent cohorts of U.S. women completing childbearing, the average age at motherhood is 25.

In contrast, the average woman in the Netherlands becomes a mother four years later at age 29. Nevertheless, two-thirds of women in the Netherlands have 2 or more children, compared with 64 percent

of women in the U.S. The difference in completed childbearing in the two countries (1.77 in the Netherlands versus 1.9 in the U.S.) reflects the fact that only 22 percent of Dutch women versus 31 percent of American women have 3 or more children. Finnish mothers enter motherhood earlier than Dutch women, at an average age of 28, but they average fewer children at completion (1.72). In summary, while postponement may limit childbearing at later ages and the transition to three or more children, this trend does not appear strongly associated with the number of children at completion. We conclude our article with a discussion of the literature's explanations for these broader trends.

## II. The 20th Century Transition to Low Fertility Rates

The total fertility rate (TFR) is the most widely used summary measure of fertility rates. It is typically constructed by summing the five-year, age-specific fertility rates observed in a given year for women of reproductive age (typically 15 to 49) and multiplying by five. The resulting statistic captures the number of children a woman would have in her lifetime if she experienced the age-specific fertility rates in a given year. Importantly, the TFR does not represent the number of children women have over their lifetimes, especially when age-specific fertility rates are changing. For example, when women delay childbearing to later ages, the TFR can fall even when completed childbearing remains unchanged, and the reverse is true when women have children sooner, as during the baby boom (Bongaarts and Feeney, 1998, 2000, 2006; Lesthaeghe and Willems, 1999). Because the TFR is measured in real time, it remains a convenient and oft-cited summary fertility statistic. We, therefore, begin by describing the evolution of the TFR across the 20th century in high-income countries.

Figure 1 plots the TFR for twenty countries as available from 1900 to 2023. The countries are organized into four panels, reflecting broad similarities in the language, geography, and today's level of fertility. (We note that Japan's experience was very different from Southern Europe in the first half of the 20th century, but we group these countries because Japan has reached a very low TFR today, which is similar to Southern European countries). Panel A plots Anglophone countries (the United States, Canada, England and Wales, Scotland, Ireland, and Australia), which share a common linguistic and institutional

heritage and also relatively elevated TFRs until recently. Panel B covers Northern European countries (Sweden, Denmark, Norway, and Finland), a group characterized by an early demographic transition and, in recent decades, fertility rates that have stabilized below replacement levels. Panel C covers Western European countries (Germany, France, Switzerland, Austria, and the Netherlands). Although these countries share a similar mid-twentieth-century fertility experience, they have diverged somewhat in recent decades, with France's TFR remaining higher and around replacement levels until recently. Panel D plots Southern European countries (Italy, Spain, Portugal, Greece) and Japan, a group collectively reaching some of the lowest TFRs in the world, with several members now recording rates below 1.3.

Across all four panels, Figure 1 documents the defining demographic transformations of the last 100 years: the transition from relatively high fertility in the early 1900s to below-replacement fertility today. At the start of the period, TFRs across these countries ranged from roughly 2.5 to over 4.0, which exceeded the commonly used replacement fertility threshold of 2.1 by a considerable margin. By 2023, no country recorded a TFR above replacement, and most fell well below this threshold.

The pace and timing of this transition varied considerably across countries. In the Anglophone countries, fertility rates dropped sharply until the onset of the Great Depression, when they stabilized. Then, they rose sharply from 1940 to 1960 during the baby boom, with Ireland's baby boom extending to around 1970. The TFR peaked in the U.S, Canada, and Australia at around 3.5, before falling sharply in the 1960s. Scotland, England, and Wales had smaller baby booms, peaking at lower than 3.0. Ireland followed a notably different path, with TFRs exceeding 3.5 well into the 1970s and not falling below replacement until the 1990s.

In Northern and Western Europe, fertility rates were below replacement in the 1930s in some countries (e.g., Sweden, Norway, Switzerland) and near replacement in others (e.g., Denmark). Moreover, the baby boom was generally more muted, with TFRs hitting no more than 3.0 around 1960, before resuming a downward trend in the 1960s. Most countries declined below replacement in the 1970s and 1980s. Germany, Switzerland, and Austria have stabilized since then at around 1.5. The Netherlands reached 1.5 in the 1980s and, after briefly recovering between 2000 and 2020, is now back at that level. A

similar pattern is visible in Finland and the other Nordic countries. France has sustained one of the highest TFRs, although it has fallen since 2007.

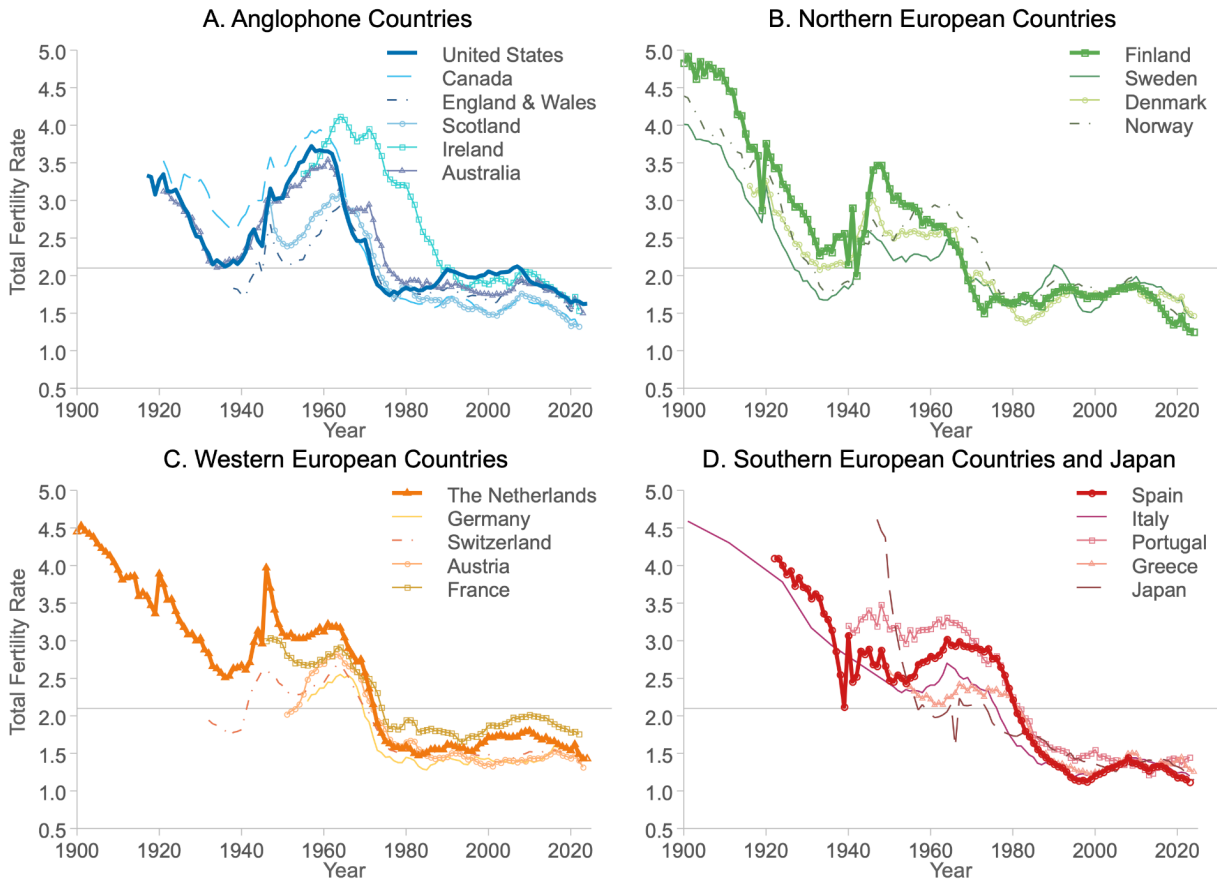
The Southern European transition was more compressed and arrived later. Because fertility rates had not dropped to the lower levels in the rest of Europe, the baby boom period appears as a halt in the first fertility transition, rather than an increase in childbearing in many countries. Spain, Italy, and Portugal maintained TFRs above 2.5 or higher into the early 1970s before experiencing one of the most rapid fertility declines observed in the developed world, reaching very low fertility rates below 1.5 by the 1990s. Japan's trajectory stands apart from all other countries in the figure: its TFR already declined sharply in the 1950s, following the legalization of abortion and rapid economic development, urbanization, and an active postwar population policy.

These trends raise multiple intriguing questions: What caused the baby boom in so many countries and why did it differ in size and timing? Why did this period of high fertility rates end abruptly in the 1960s and 1970s? Why have high-income countries transitioned almost universally to below-replacement fertility? Will replacement fertility rates return? For space reasons, this chapter will focus on the last three questions and omit an in-depth treatment of the baby boom.<sup>2</sup>

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<sup>2</sup> Multiple papers investigate the causes of the baby boom. Interested readers are referred to Easterlin (1961), Hajnal (1953a,b), Ryder (1965), Becker and Barro (1988), Becker, Murphy, and Tamura (1990), Greenwood et al. (2005), Murphy et al. (2008), Bailey and Collins (2011), van Bavel and Reher (2013), Doepke et al. (2015), Albanesi and Olivetti (2014, 2016), Brodeur and Kattan (2022), Dettling and Kearney (2025), and Zwiers (forthcoming).

Figure 1. Total Fertility Rates over the 20th Century in Selected High-Income Countries



Notes: The dashed horizontal line indicates the conventional replacement-level fertility rate of 2.1 births per woman. In panels A-D, total fertility rates for all countries except Australia, Finland, Greece, Italy, the Netherlands, the United States, and Norway before 1967 are drawn from the Human Fertility Database (HFD; Human Fertility Database, 2026). Coverage begins at the earliest available year in the HFD for each country: Sweden (1891), Denmark (1916), Norway (1920), Canada (1921), Spain (1922), Switzerland (1932), England and Wales (1938), Portugal (1940), Scotland (1945), France (1946), Japan (1947), Austria (1951), Italy (1901), Greece (1950), Ireland (1955), and Germany (1956). Data for Australia are drawn from the Australian Bureau of Statistics and the Human Fertility Collection (HFC; Human Fertility Collection, 2026). Note that HFC estimates may not meet the same quality and comparability standards as HFD data. Norwegian data before 1967 are from the HFC. Data for Greece are from the HFC before 1975 and from the Hellenic Statistical Authority (ELSTAT) from 1975 onwards. Italian data before 1952 are from Table 6 of Bacci & Breschi (1990), and data from 1952 onwards are from the Istituto Nazionale di Statistica (Istat). Data for Finland come from Statistics Finland (Statistics Finland, 2025). The data for the Netherlands comes from Statistics Netherlands Statline Table “*Bevolking, huishoudens, en bevolkingsontwikkeling; vanaf 1899*”. Data for the United States comes from the CDC National Vital Statistics.

### III. A Cohort Perspective on the Transition to Below-Replacement Fertility Rates in Four Countries

Although the TFR provides a useful summary measure of fertility rates, it has several limitations. First, the TFR conflates changes in how many children women ultimately have (called *quantum*) and changes in when they have them (called *tempo*). When women systematically shift the timing of their births, either accelerating or delaying childbearing relative to prior generations, the TFR diverges from completed cohort fertility even if lifetime family sizes remain largely unchanged (Bongaarts and Feeney, 1998, 2000, 2006; Lesthaeghe and Willems, 1999).

Second, the factors shifting individuals' choices matter differently at different points in the lifecycle. For example, changes in school leaving ages affect the initiation of motherhood but not completed childbearing (Black et al. 2008, McCrary and Royer 2011, Anderberg and Zhu 2014, Fort et al. 2016, Geruso & Royer 2018, James and Vujić 2019). Alternatively, losing a job reduces total childbearing (through the income effect) and accelerates its timing (Lindo 2010, Huttunen and Kellokumpu 2016), although the sign of the effects depends on whether a woman or man loses a job (Schaller 2016). Changes in housing supply and prices have different effects on owners and renters (new home buyers): an increase in home prices (or the costs of borrowing) tends to reduce fertility rates among new home buyers, whereas increases in home prices raise equity among home owners and raise fertility rates (Dettling and Kearney 2014, Cumming and Dettling 2024).

We therefore use newly combined microdata from four countries to examine the patterns underlying these aggregate TFRs in greater depth: Finland, the Netherlands, Spain, and the United States. The United States represents the Anglophone experience and is notable for maintaining comparatively higher fertility than most of its European counterparts (except France, Ireland, and Iceland). Finland and the Netherlands exemplify the Northern and Western European pattern of moderate but sustained below-replacement fertility rates. Spain represents the transition to very low fertility rates in Southern Europe and Japan, moving from one of the highest fertility countries to one of the lowest in the

high-income world within two decades. Our cohort analysis of the fertility transition focuses on four key measures: completed childbearing, the distribution of childbearing across parities, the evolution of childlessness, and the shifting timing of first births that together define the contemporary landscape of low fertility rates in high-income countries.

*A. Comparing Changes in the TFR to Changes in Completed Fertility Rates*

Figure 2 plots the TFR (dashed line) and completed childbearing (solid line) for the four countries with available microdata. The TFR is measured in calendar time and plotted at the bottom of the figure. Completed childbearing is measured by cohort and plotted by mothers' birth cohort along the top of the figure. The axis for birth cohort is advanced by 25 years so that the fluctuations in the series align, and because this shift places calendar time close to the age at which most births occur. Together, the two series allow us to distinguish how the shifting TFR corresponded to how many children women have.

Two striking features of Figure 2 are how closely the trends in the TFR and completed cohort fertility track one another across much of the twentieth century and how much their levels diverge when the timing of childbearing shifts. In the United States, both series decline from the early twentieth century through the 1930s, reflecting the long-run decline in family size in the post-Civil War era. The two measures diverge during the baby boom, with the TFR reaching approximately 3.7, implying that the average woman would have almost four children at prevailing age-specific fertility rates. In contrast, completed childbearing rises more modestly to just over 3 children. The gap reflects the tempo effect: as women of the baby boom generation had children at younger ages, the TFR rose more than completed family size. Similarly, the TFR's inflation in the post-WWII era is visible in Finland, the Netherlands, and Spain, where the dashed line likewise peaks well above the contemporaneous level of completed cohort fertility.

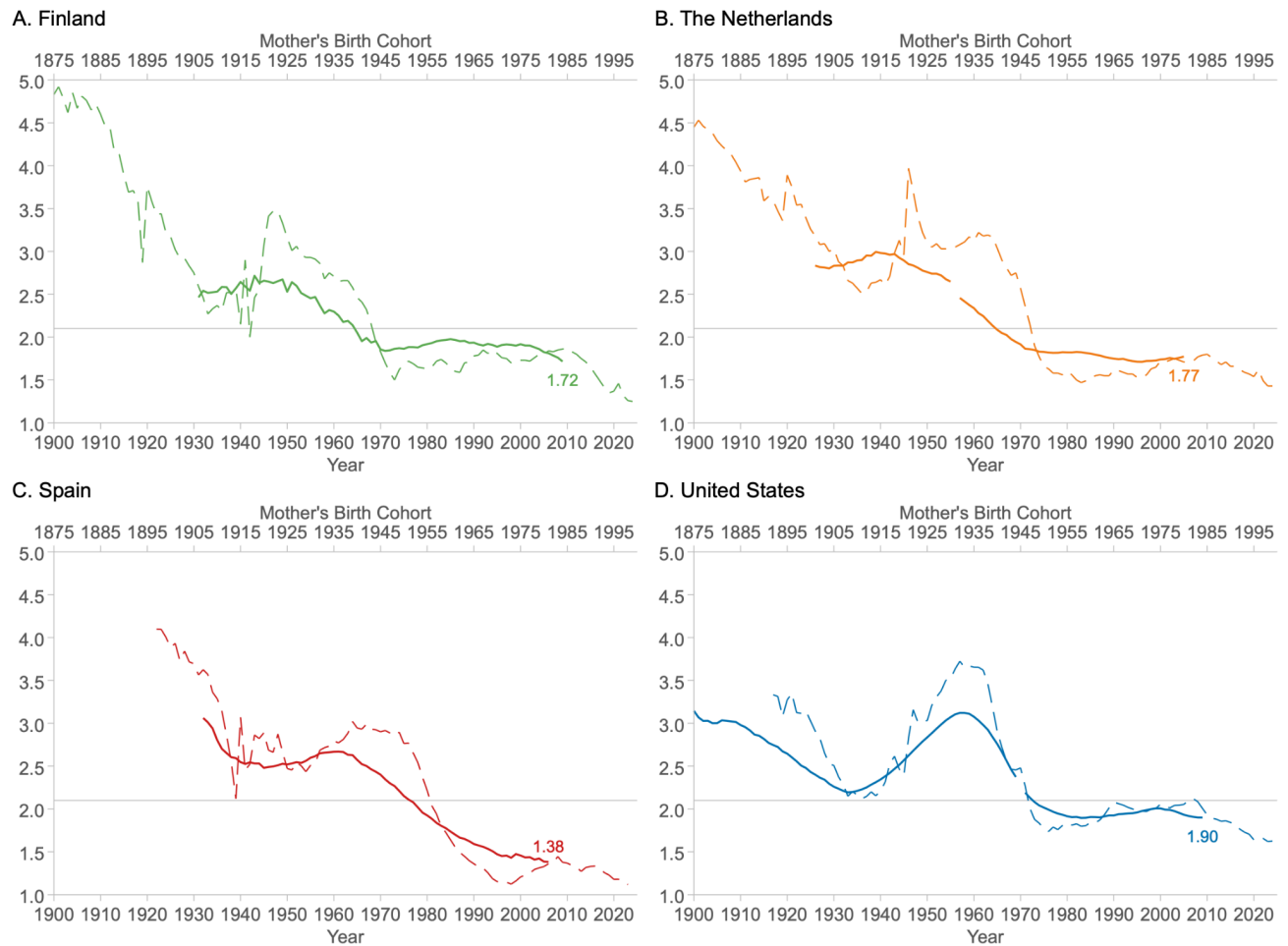
The divergence between the two measures during the fertility decline of the 1960s and 1970s is equally instructive and consequential for contemporary fertility debates. As the baby boom receded, women across all four countries began delaying childbearing while pursuing higher education, entering the labor force, and postponing motherhood. This postponement caused TFRs to fall far more sharply than

completed childbearing. Childbearing was not foregone so much as postponed. In the United States, the TFR fell from its baby boom peak to below replacement rates around 1.7 by the mid-1970s, yet the completed fertility of the associated cohorts (who were delaying motherhood) remained around two children. For mothers born between 1950 and 1984, completed fertility has remained remarkably stable near two children per woman, despite a substantial dip and recovery in the TFR.

In Finland, the Netherlands, and Spain, the same dynamic played out similarly. In the 1990s, the Spanish TFR collapsed to below 1.2, among the lowest ever recorded anywhere, before rebounding slightly. Yet the completed fertility of Spanish cohorts born in the 1960s fell only to 1.5. Similarly, the TFR recovered as women who had postponed childbearing gave birth, but completed childbearing did not rise. Finland and the Netherlands offer another instructive contrast. These countries' TFRs rose modestly from its early-2000s trough up until 2010, a pattern sometimes interpreted as evidence of a fertility recovery. Yet as Figure 2 makes clear, completed cohort fertility for Finnish and Dutch women has remained essentially flat across the relevant cohorts, showing no corresponding increase. The divergence suggests that the uptick in the TFR reflects the realization of delayed childbearing. As the first postponement transition has run its course, Finnish and Dutch women have largely completed their shift toward later childbearing. This postponement of births into the late thirties has temporarily elevated the period measure above its long-run cohort level.

In summary, this tempo-driven wedge between period and cohort measures cautions against overinterpreting short-run declines in the TFR since 2007. TFR trends at the current fertility frontier, as postponement transitions are still working themselves out, must be interpreted with caution. Where completed childbearing of modern cohorts will ultimately land depends on whether childbearing is delayed or women choose to opt out of having additional children — a question that will remain unresolved until the youngest cohorts reach the end of their childbearing years.

Figure 2. Total Fertility Rates and Completed Childbearing over the 20th Century in Finland, the Netherlands, Spain, and the United States



Notes: Solid lines represent the mean number of children ever born for each cohort and dashed lines represent the total fertility rate. Estimates are for single-year birth cohorts. Data for the Finnish TFR come from Statistics Finland, births; data on completed fertility are compiled from full-population FOLK census and register microdata modules and the 1970 census fertility survey sample. Data for the Netherlands on TFR come from Statistics Netherlands Statline Table “Bevolking, huishoudens, en bevolkingsontwikkeling; vanaf 1899”; information on completed cohort fertility is compiled using the 1971 Census for the 1901–1931 cohorts and Statistics Netherlands microdata for the 1931–1980 cohorts. Data for Spain are from the HFD. For the United States, data for the 1850–1930 cohorts were calculated using the 1900, 1910, 1940, 1950, 1960, 1970, 1980, and 1990 decennial censuses, while data for the 1950–1984 cohorts were calculated using the 1976–2024 June CPS (Fertility and Marriage Supplement).

### *B. Differences in Birth Timing across Countries*

Figure 3 decomposes the TFR into its age-specific components, plotting period age-specific fertility rates (ASFRs) for five-year age groups from 15–19 through 40–44 across the four countries from 1920 to the present. These panels reveal substantial variation in the timing of childbirth across countries. Notably, these differences in the timing of childbearing across countries have persisted, even as all four countries have transitioned to below-replacement fertility rates.

Several features of Figure 3 deserve particular attention. The first is the exceptionalism of early childbearing in the United States relative to the three European countries. Over the 20th century, American women under 25 exhibited markedly higher fertility rates than their counterparts in Finland, the Netherlands, and Spain. These gaps are pronounced for teens, where U.S. rates are 2 to 4 times higher. The pattern of low teenage childbearing holds for other European high-income countries as well, except the United Kingdom (Eurostat 2019). This early childbearing pattern has long been a feature of U.S. demography and, today, likely reflects higher rates of unintended pregnancy, large socioeconomic differences in the timing of family formation, and differing institutional and policy environments (Darroch et al. 2001).

Another notable feature of Figure 3 is the historically high level of fertility at ages 30–34 and 35–39 in Finland, the Netherlands, and Spain in the mid-twentieth century, followed by a dramatic decline and then recovery in these age groups. For women ages 30–34, these countries recorded age-specific fertility rates above 150 before the baby boom, before declining in the 1960s and 1970s as women postponed motherhood. This pattern reflects the early European marriage and fertility pattern, where childbearing extended well into the thirties (Hajnal 1965, Carmichael et al. 2016). More striking, perhaps, is the reversal: fertility rates at ages 30–34 and 35–39 in all three European countries have recovered from their mid-century lows. In the last decade, Finnish, Dutch, and Spanish fertility rates at ages 30–34 match or exceed those of the U.S. at the same ages, which is a return to the cross-country patterns earlier in the 20th century.

Fertility rates at ages 25–29 capture the transition between these two regimes. The late twenties were the modal childbearing ages across the four countries for much of the twentieth century. During the baby boom, the four countries show a pronounced peak for this age group, followed by a decline—but the decline is sharpest and earliest in the United States and Finland, followed by the Netherlands, and lastly Spain.

At older ages, the divergence between the United States and the three European countries has narrowed in recent decades. Since the 1990s, fertility rates in the late thirties have risen substantially in Finland, the Netherlands, and Spain, as women born in the 1960s and 1970s postponed childbearing. Childbearing in the U.S. in the late thirties has also risen, but from a lower base, reflecting the overall younger age profile of American childbearing. For women in their early forties, we see a similar story: rates are low across all four countries, with recent years showing measurable increases in Finland, the Netherlands, and Spain, with the United States lagging.

Figure 4 summarizes the average age at first birth across birth cohorts in the four countries.<sup>3</sup> The average age at first birth is around 2 years younger in the United States than in Finland for cohorts born in the early 20th century, falls during the baby boom as women enter motherhood even earlier, and then rises again to approximately its pre-baby boom level for the most recent 1984 cohort, in which first births are observed through age 40. This pattern is parallel in Finland, where age at first birth similarly dips for cohorts born in the middle of the 20th century. Subsequently, the average age at motherhood rises faster than in the United States, reaching age 28 for the most recent cohorts. A similar pattern is observed for the Netherlands, where age at first birth dips even more for middle-20th-century cohorts, followed by an increase in average age at motherhood that levels off around age 29. Although we do not measure the average age at first birth for early 20th-century cohorts in Spain, cohort trends since the mid-1950s lag the Netherlands slightly, then catch up and surpass its average for the most recent cohorts, who now enter motherhood on average after age 30.

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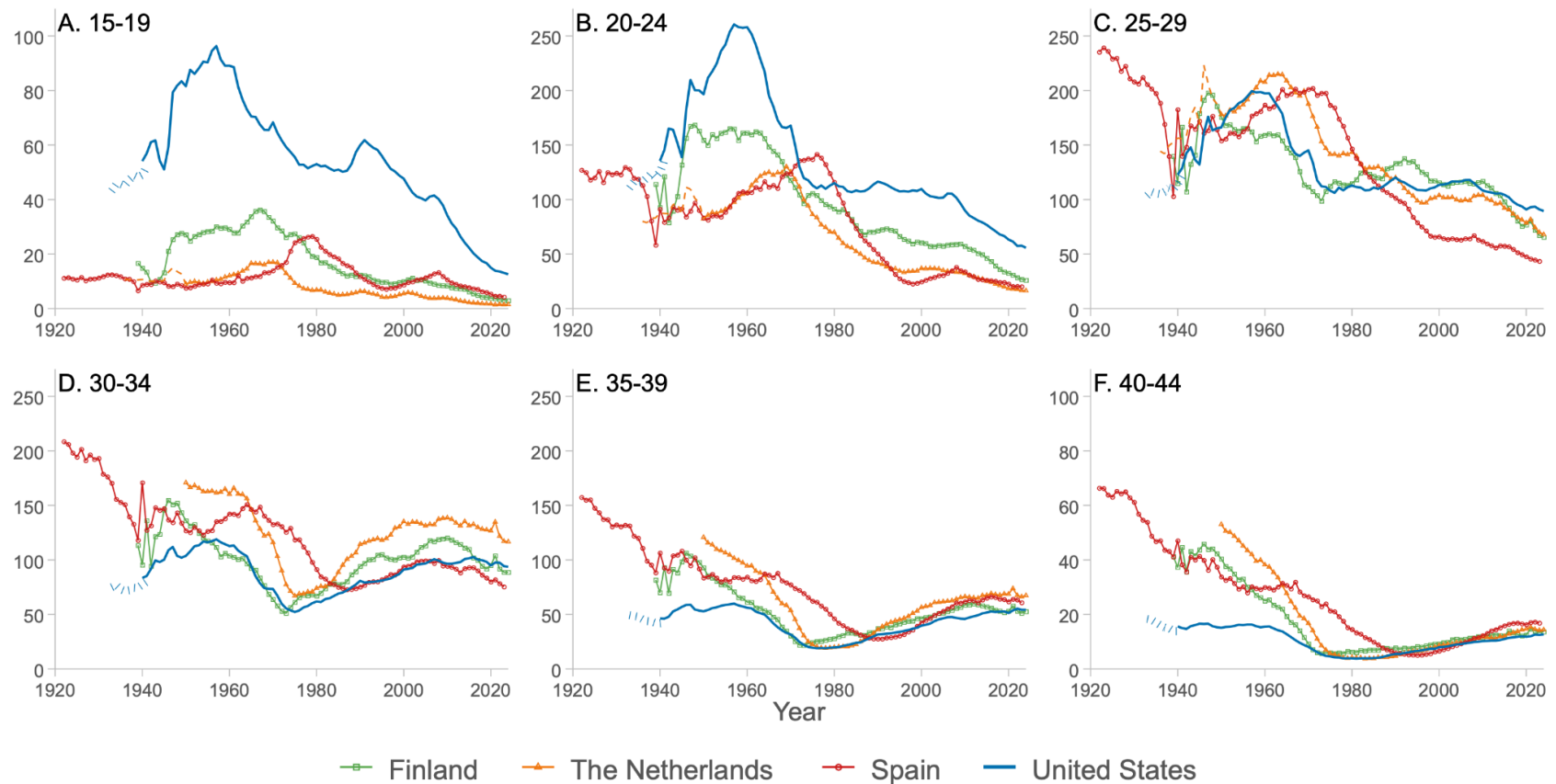
<sup>3</sup> For mothers born in 1981–1984, first births occurring after age 40 are not fully observed in the data. The average age at first birth may be underestimated once accounting for these later births when the data are available.

Taken together, Figures 3 and 4 underscore a central argument of this chapter: that the similar aggregate TFR levels today in the United States, Finland, the Netherlands, and Spain are reached very differently. American women continue to bear a disproportionate share of their children in their twenties (although this has been changing since the Great Recession), which distinguishes the United States from virtually all other high-income countries (including Canada). Dutch women have shifted toward a concentrated pattern of childbearing in their late twenties and early thirties, producing a relatively narrow and late fertility schedule. Finnish women's shift in fertility places them between the United States and the Netherlands, although differences in age-specific fertility rates between Finland and the other countries have narrowed recently. Spanish women exhibit the most extreme postponement of all, with fertility rates in the thirties now accounting for the majority of period fertility.

*C. Changes in the Distribution of Completed Childbearing across Cohorts and Countries*

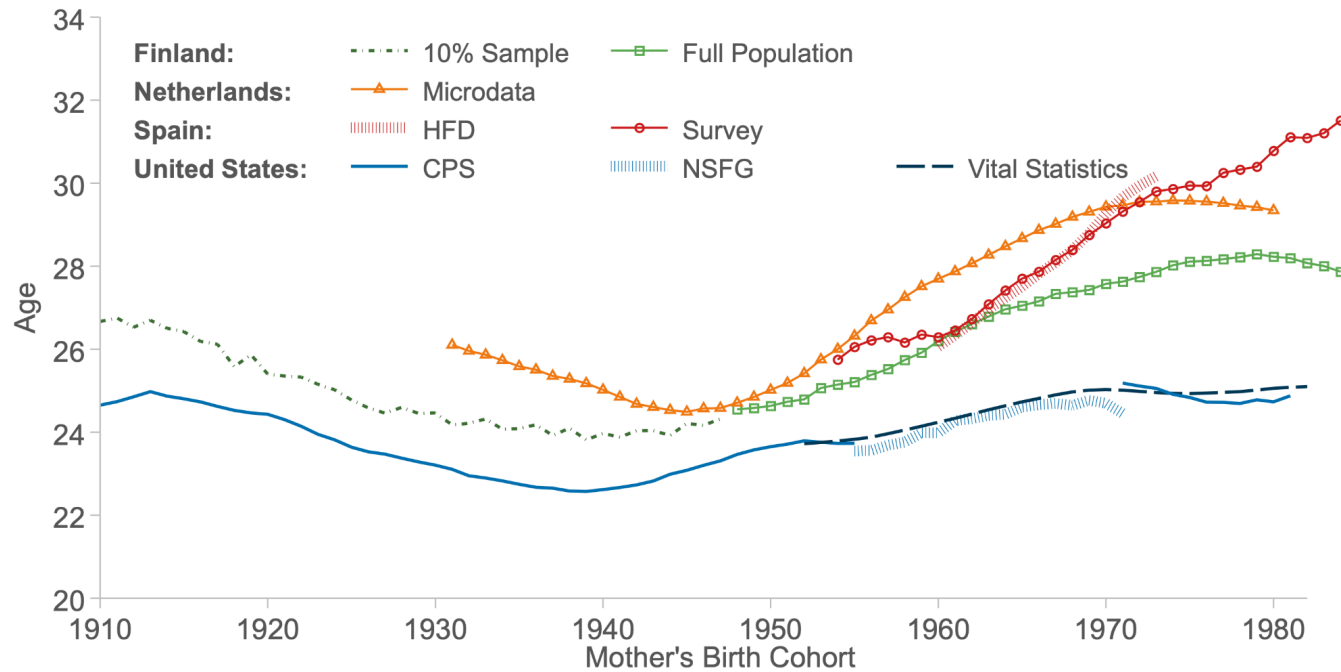
Figure 5 shows how the distribution of completed childbearing varied across countries. Each line plots the percent of women in a given birth cohort who had exactly zero, one, two, three, four, or more children, allowing us to trace patterns in family size over time. The upper four panels plot the distributions of completed childbearing for the birth cohorts of 1910, 1920, 1930, and 1940, whereas the lower four panels plot these distributions for women born in 1950, 1960, 1970, and 1980. When comparing women born in the first half and second half of the 20th century, the most consequential shift visible across all countries is increased concentration of completed childbearing around the modal outcome of two children. The emergence of this strong two-child norm begins earlier in Finland and the Netherlands with the 1940 cohort and is strongly evident in all four countries by the 1950 birth cohorts,

Figure 3. Age-Specific Fertility Rates over the 20th Century in Finland, the Netherlands, Spain, and United States



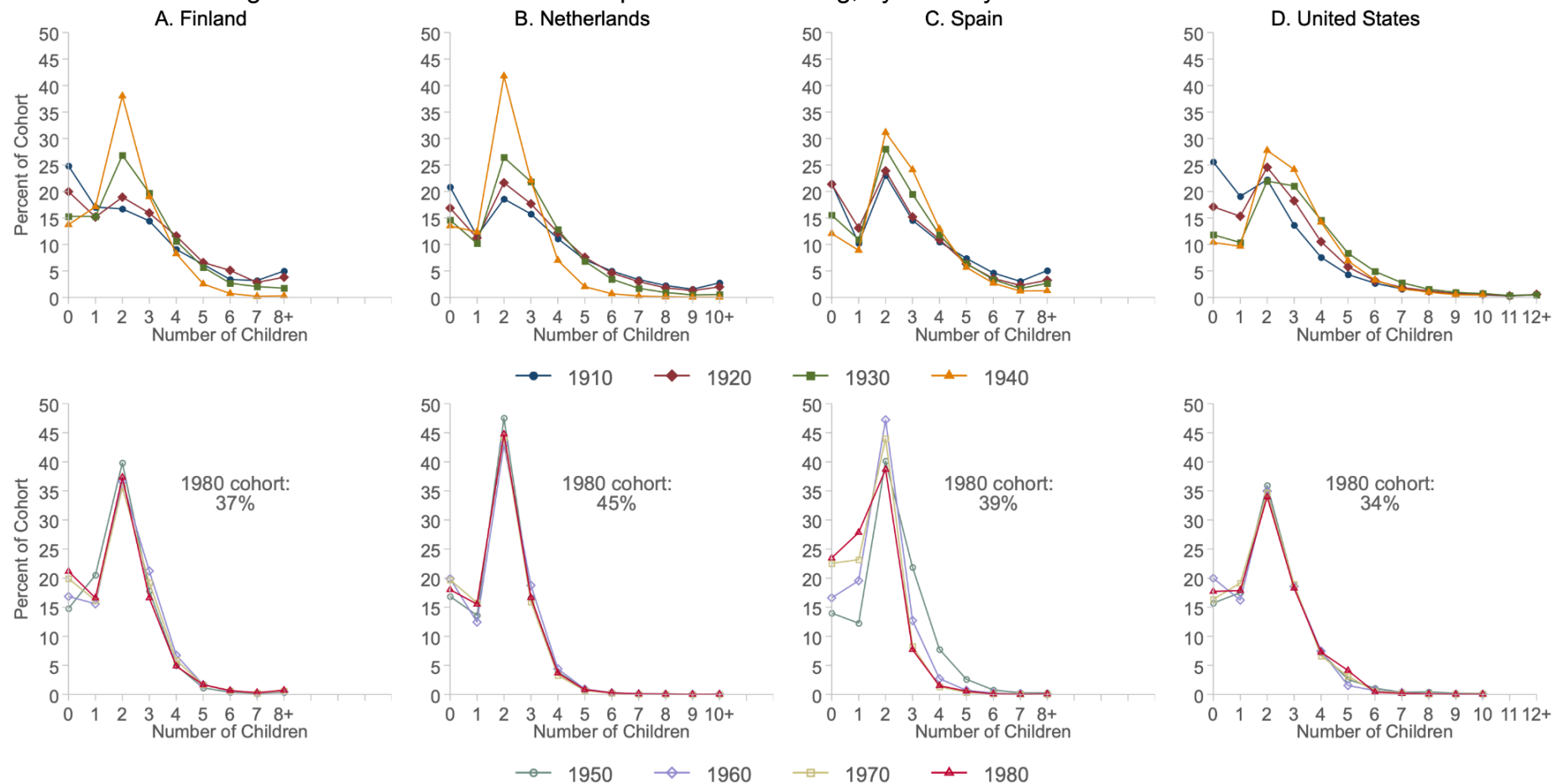
Notes: The figure shows age-specific fertility rates by country. Data for the Netherlands are from Statistics Netherlands Statline table, "[Levend geboren kinderen, leeftijd moeder, volgorde geboorte uit de moeder](#)"; data for Finland and Spain are from the HFD; data for the United States are from the CDC and National Vital Statistics Reports (1940–2024) and the HFD (1936–1940). For the Netherlands, data before 1950 are drawn from a different source table and are shown as a dashed line; ages 30 and above are grouped in this earlier table, so rates for the 30–34, 35–39, and 40–44 age groups are unavailable for this period. From 1950 onwards, the 15–19 age group for the Netherlands reflects births to women aged 20 and under. The US HFD series (1936–1940) is shown as a dotted line.

Figure 4. Average Age at First Birth, by Country and Mother's Birth Cohort



Notes: Data for Finland are compiled from full-population FOLK census and register microdata modules and the 1970 census fertility survey sample. Data for the Netherlands are compiled using Statistics Netherlands microdata. Data for Spain are from the HFD and the 1981, 1991, and 2011 censuses and the 2018 Fertility Survey. For the United States, data for the 1910–1955 and 1971–1979 cohorts are from the 1976–2023 June CPS (Fertility and Marriage Supplement), while data for the 1955–1971 cohorts are from the NSFG (Integrated Fertility Survey Series); Vital Statistics data (1969–2022) are shown as a dashed line alongside the NSFG series. The CPS sample consists of women aged 40 and older, the NSFG sample consists of women aged 35–45, and the Vital Statistics sample is unrestricted by age. The 1971–1979 CPS cohorts are reweighted using Vital Statistics data.

Figure 5. The Distribution of Completed Childbearing, by Country and Mother's Birth Cohort



Notes: The figure shows the distribution of children ever born by birth cohort. Estimates are for single-year birth cohorts. Data for Finland are assembled from full-population FOLK census and register microdata modules and the 1970 census fertility survey sample. Data for the Netherlands are compiled using data from Statistics Netherlands; the 1901–1930 cohorts are compiled using the 1971 census, and the 1931 onwards cohorts are compiled using the microdata. Data for Spain are from the 1981, 1991, and 2011 censuses and the 2021 ECEPOV survey. For the United States, data for the 1850–1930 cohorts were calculated using the 1900, 1910, 1940, 1950, 1960, 1970, 1980, and 1990 decennial censuses, while data for the 1950–1980 cohorts were calculated using the 1976–2024 June CPS (Fertility and Marriage Supplement). In 2018, the CPS changed the top code for the children ever born measure, grouping all women with more than five children into a single "5 or more" category. To adjust for this change, we took the mean share of women at each parity from 6 to 10 children across the 1970–1976 cohorts and applied these means to the 1980 cohort, then subtracted the resulting cumulative shares from the "5 or more" category.

who were entering their childbearing years in the 1970s. In the United States, at least 35 percent of women in the 1950 cohorts had exactly two children — a statistic that has remained stable for the last thirty years. In fact, the distribution in the United States has remained so stable that one can barely distinguish the childbearing distribution of the 1980 cohort from the 1950 cohort. In Finland, the Netherlands, and Spain, the concentration around two children is even more pronounced, at 37, 45, and 39 percent, respectively. This consolidation around a two-child norm is one of the most robust features of contemporary fertility in high-income countries and reflects the two-child family as both a descriptive reality and widespread aspiration both within and across countries.

The cross-country differences in childlessness represent a second important dimension. All countries had childlessness rates that exceeded 20 percent for the cohort born 1910, which declined to less than 15 percent during the baby boom era. In the most recent cohorts, around 20 percent of Finnish and Dutch women remain childless, while the US maintains lower and Spain higher childlessness rates. Spain presents a somewhat different pattern from the other countries: childlessness among older Spanish cohorts was relatively higher than in the other three countries, at 22 percent among women born in 1920. This rate of childlessness was almost as common as having exactly two children for this cohort, at around 25 percent. Over the course of the 20th century, however, childlessness rates dropped to around 12 percent during the baby boom cohorts before rising back to early-20th-century levels of around 24 percent. In short, the reversion to higher rates of childlessness in Spain relative to the other three countries is more of a homecoming than a departure from historical fertility patterns.

Figure 6 offers a complementary perspective on these distributional shifts, plotting cumulative parity progression curves for each country. It shows the share of women in each birth cohort who had at least one, at least two, at least three, and at least four children. This representation makes it straightforward to see, for any given cohort, both the incidence of childlessness (the gap between 100 percent and the "1 or more" series) and the rate at which women transitioned from one to two children, and so on. Together, these curves detail changes in completed fertility across cohorts that average measures alone cannot provide.

The most immediately visible feature across all four country panels is the relative stability of the share of women becoming mothers (having at least one child), which rises slightly during the baby boom cohorts before returning to pre-baby boom levels. While many commentators believe that falling fertility rates reflect women opting out of motherhood, these series show that rates of childlessness have remained very stable across four different countries and, in the modern period, have *reverted* to their pre-baby boom levels rather than shifted patterns.<sup>4</sup>

A second major pattern reflects the transitions from one-to-two and two-to-three children. In the United States, Finland, and the Netherlands, the share of women having two children closely tracks the share becoming mothers, suggesting that this transition remained stable over the entire period considered, narrowing slightly during the baby boom as more women transitioned from one to two children. For the most recent Finnish and especially Dutch cohorts, the share having three or more children has declined to levels much lower than in the United States.

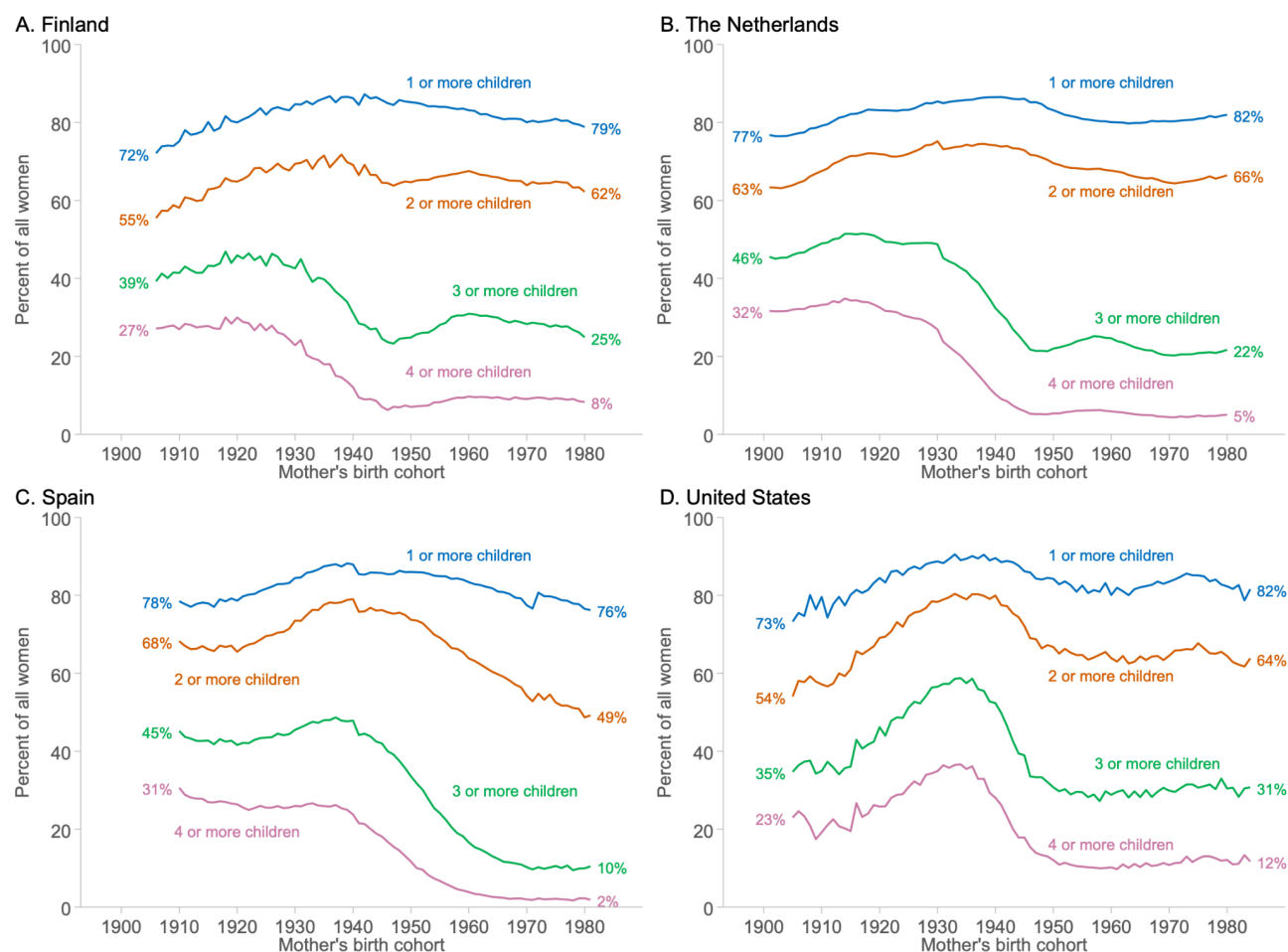
Changes in parity progression in Spain are, however, much different than in the other countries. Although transitions from one to two children remained very similar for women born from 1910 to 1950, transitions from one to two children dropped sharply for women born in 1950 and later. These declining transitions from one to two children in Spain contribute heavily to very low fertility rates. Similarly, higher parity childbearing declined more sharply in Spain than in the other countries. And, unlike the trend for childlessness, these patterns do not reflect mean reversion after the baby boom. For cohorts born in the early part of the twentieth century, considerably more Spanish women had 3 or more and even 4 or more children, relative to their counterparts in the United States and Finland. In fact, around 45 percent of Spanish women born around 1910 had at least three children, and more than a fifth had four or more. These curves decline steeply for successive cohorts, accelerating sharply for cohorts born after 1940 and reaching very low levels for those born in the 1960s and 1970s. The share of women having 3 or more

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<sup>4</sup> According to survey evidence a large part of current childlessness is voluntary: for example, among Finnish women ages 25–45 who currently have less than four children 13 percent state they would prefer to remain childless, while 8 percent would prefer to have one child, 48 percent to have exactly 2 children and 31 percent to have three or more children (Sorsa, Lehtonen & Rotkirch 2023). The largest gaps between aspirations and realizations seem to be in the transitions from first births to second births and from two children to three or more.

children in Spain fell from around 45 percent for the 1910 cohort to well below 20 percent for the 1970 and 1980 cohorts, more than halving the probability of having a third child over three generations. The share having four or more children shows a precipitous decline, falling from a level that placed Spain among the highest-parity countries in Western Europe to near zero for the most recent cohorts.<sup>5</sup>

Figure 6. Changes in Parity Progression, by Mother's Birth Cohort and Country



Notes: The figure shows the share of women in each parity group by birth cohort. Data for Finland are constructed from full-population FOLK census and register microdata modules and the 1970 census fertility survey sample. Data for the Netherlands are from Statistics Netherlands; the 1901–1930 cohorts are from the Census and the 1931 onwards cohorts are from the microdata. Data for Spain are from the 1981, 1991 and 2011 censuses and the 2021 ECEPOV Survey. Data for the United States are from the 1976–2024 June CPS (Fertility and Marriage Supplement).

<sup>5</sup> See Reher and Requena (2019) for more details on childlessness in Spain for cohorts born in 1920–1969. Vidal et al. (2026) study completed fertility in Spain for cohorts 1962–77 in connection with (the timing of) union formation. Requena and Reher (2025) compare completed cohort fertility for men and women in Spain. See also Van Bavel et al (2018) for more details on completed fertility for cohorts 1901–45 (in 15 countries, including Spain).

In all four countries and across nearly all cohorts, the overwhelming majority of women who began childbearing went on to have at least two children — the progression from first to second birth has remained high and broadly stable even as aggregate fertility has fallen in Finland, the Netherlands, and the United States. What drove completed fertility downward across the twentieth century was not women opting out of motherhood, but a sharp and sustained decline in the probability of having three or more children. In Spain, women have restricted childbearing even more, with significantly fewer in modern cohorts transitioning from one to two children.

In summary, convergence toward low fertility across these four high-income countries shares many similarities: the emergence of a strong two-child norm and the collapse of childbearing outcomes around this mode, and fairly similar or lower rates of childlessness than were present roughly a century ago. However, these patterns occurred at different times in Europe and the US and also reflect differences in the timing of childbearing, with the US patterns dominated by early motherhood.

The emergence of the two-child norm has been achieved largely by arresting parity progression. Figures 5 and 6 clarify that today's low TFRs are not principally a story of rising childlessness. Although today's rates of childlessness are similar to the past, they are no longer offset by high rates of higher-order births. The potential for increasing fertility rates in the four high-income countries we study broadly relates to the determinants of progression to the third child and, in Spain, also to the determinants of progression to the second child.

#### IV. Conclusions

The transition to low fertility in high-income countries is often summarized in a single statistic: the total fertility rate. Yet, the evidence presented in this chapter shows that understanding the long-run evolution of fertility requires looking beyond period measures alone. By combining the period TFR and age-specific fertility rates with detailed microdata on completed fertility, this chapter documents several common features of the twentieth-century fertility transition that aggregate statistics obscure.

*First*, period and cohort measures of fertility track closely over the twentieth century but diverge in periods when the timing of childbearing shifts. The baby boom illustrates how earlier childbearing raised the TFR relative to completed family size, while the baby bust in the 1960s lowered the TFR below completed childbearing because it captured postponement. This tempo-quantum distinction, as demographers would call it, remains important to interpreting current fertility trends. Although period fertility rates in high-income countries have fallen to historic lows in recent years, our cohort analysis suggests that completed childbearing has not declined by as much as the TFR suggests. As a result, extremely low fertility rates today reflect, in part, the statistical consequences of delayed childbearing rather than changes in family structure.

*Second*, the long-run decline in fertility across the twentieth century reflects a profound shift in the distribution of family sizes. This change was not gradual but appeared abruptly following the introduction of modern contraception (e.g., birth control pills) or abortion, allowing couples to choose their number of children with precision. Following the introduction of modern contraception and abortion, completed childbearing converged toward a modal outcome of two children across the four countries in our study. The two-child family is one of the most striking and common features of childbearing in high-income societies. This transition was driven by the disappearance of large families—those with three or more children—rather than by sharply rising rates of childlessness. Although childlessness has fluctuated across cohorts and countries, its level today is broadly comparable to rates observed among cohorts born in the early twentieth century. A hallmark of the late-20th-century transition to low rates of childbearing is the reduced likelihood that couples have more than two children.

*Third*, despite convergence in overall fertility levels, the timing of childbearing continues to vary substantially across countries. The United States maintains a comparatively young fertility schedule, with declining but still high rates of childbearing among teens and women in their twenties. In contrast, childbearing in Finland, the Netherlands, and especially Spain has shifted decisively into the thirties. These differences in the age profile of childbearing cause aggregated TFRs to mask very different demographic processes; they also imply large differences in the scope for recuperating delayed births

across countries: societies in which childbearing already occurs late in the reproductive life course face tighter biological constraints on further postponement.

Policy discussions around raising fertility rates should engage with nuances in the cohort data. Across the four countries we study, the two-child family remains the modal outcome, and rates of motherhood have not fallen substantially in three of the four countries we study (the exception is Spain). Both this pattern and the sharp decline in progression to third births (in Spain, to second births) may reflect the realization of preferences, which was more difficult in the era before contraception and abortion allowed near-perfect stopping. Notably, the two-child norm emerged well before today's concerns about the rising costs of children (including the affordability of housing and childcare), greater uncertainty about the future, and weakening economic prospects for young adults (especially men). However, current affordability trends have almost certainly reinforced this norm (Kearney & Levine 2025). Going forward, the tendency toward postponement, driven by affordability and uncertainty, may erode the two-child norm, so that more countries transition toward a one-child norm, as is emerging in Spain.

Locating these changes in the large, longer-term causes of reduced childbearing helps explain the drivers. As contraceptive technology lowered the costs of dating, more women and men delayed childbearing in pursuit of better partners and economic and social mobility for themselves and their children. Many women took unprecedented steps to get more education, work more outside the household (even when they had young children), and pursue higher-paying careers where they had been underrepresented. These transitions were supported by laws banning sex-based discrimination in educational admissions, pay, and employment (Bailey et al. 2024, Beller 1979, Beller 1982a,b, Carrington et al. 2000, Goldin 2023, Gruber 1994, Kurtulus 2012, Helgerman 2023, Holzer and Neumark 2006, Leonard 1984, Manning 1996). Together, changes in expected returns to work and increased time costs of parenthood shifted how people organized work and family responsibilities. The bigger picture is that these many small shifts in individual decisions shifted larger societal norms around partnership, parenthood, and work, raising the anticipated time and resource costs of having children. Both directly and indirectly

through their effects on postponement, individual tendencies toward delay have made search longer and costlier, sometimes resulting in the biological clock running out.<sup>6</sup> In this sense, the decline in progression to third births is a key behavioral margin through which the “new era in fertility” operates (Doepke et al. 2023).

Failing to achieve one’s childbearing goals has been one of the unintended consequences of this larger postponement transition, raising the use of modern assisted reproductive technologies (ART) worldwide (Ferraretti et al., 2017; De Geyter et al., 2020), alongside the rising popularity of egg freezing for non-medical reasons such as career considerations (Katsani, 2024). But while ART reduces the risk of involuntary infertility, its insurance value simultaneously encourages further postponement. ART use is rising, but access is far from universal. Bögl et al. (2025) highlight significant socioeconomic disparities in ART take-up, finding that lower-income individuals are more likely to forgo treatment when insurance coverage is absent.

Against this backdrop, it is perhaps unsurprising that policy interventions have failed to reverse these broader trends. Even very generous cash transfers and baby bonus programs have tended to produce only temporary (if any) effects on fertility rates, mainly affecting birth timing with more mixed evidence that they affect completed childbearing (Malkova 2018, Bailey 2025, Albanesi et al. 2023). Paid family leave has fared no better, showing little effect on fertility in the United States (Bailey et al., 2025) and mixed results internationally (Dahl et al., 2016; Lalive & Zweimuller, 2009; Olivetti & Petrongolo, 2017; Raute, 2019; Stearns, 2018). Evidence from several countries suggests that policy changes influencing grandparental availability can lead to measurable, but comparatively modest, variations in fertility outcomes (Ilciukas 2023; Akyol and Atalay 2025; Eibich and Sieder, 2020).<sup>7</sup> Similarly, changes in the affordability of housing can affect fertility rates in the short run (Dettling and Kearney 2014; Cumming

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<sup>6</sup> For example, the most common reasons to postpone parenthood among childless Finnish women and men ages 20–34 are lifestyle and career considerations. Men are also likely to mention the lack of a partner and economic uncertainty as reasons for postponing parenthood (Sorsa, Lehtonen & Rotkirch 2023). Similarly, Van Wijk (2023) shows that unstable economic and employment conditions are associated with a delay in births in the Netherlands.

<sup>7</sup> Other quasi-experimental evidence leverages the death of a grandparent (Glaser and Wiesinger, 2025, for Austria, Dahlberg, 2020, for Sweden, Jensen and Zhang, 2026, for Denmark) or variation in proximity (Pink, 2018 for Germany, Rutigliano, 2024 for the UK) and availability to help with childcare (Aassve et al., 2012 for Europe, Kaptijn et al, 2010 and Thomese and Liefbroer, 2013 for the Netherlands) to estimate the effects of informal care on fertility outcomes.

and Dettling 2024). The cost of housing is one likely cause of the substantial variation in the age of leaving the parental household across European countries: more than half of Nordic youth leave their parental household by age 22, whereas the majority of Southern Europeans live with their parents until their thirties (Eurostat 2023).<sup>8</sup> However, the literature is silent on whether changes in the housing market translate into differences in completed childbearing.

Taken together, the literature shows that even substantial policy changes have been insufficient to reverse trends in declining fertility. Meaningful change likely requires broader structural shifts in how parenthood fits into working life. The modest but real baby bump associated with expanded remote work during the COVID-19 pandemic (Bailey et al. 2023) and beyond (Davis et al. 2026) hints at what that might look like: not subsidies layered onto an unchanged work environment, but changes to the environment itself.

Looking forward, an important open question is whether the recent declines in the TFR will translate into lower completed childbearing for younger cohorts today. If the recent declines reflect postponement of younger childbearing, completed family size may remain relatively stable, as long as these cohorts do not delay too long. If postponement signals declining progression to second birth (as in Spain), then completed childbearing will decline. Distinguishing between these possibilities is not possible without waiting for these cohorts to age.

In summary, the evidence in this chapter suggests that the demographic landscape of high-income countries is not defined by a retreat from parenthood (yet). While the postponement of parenthood is universal, whether the postponement of parenthood will lead to an increase in childlessness will only be known once these younger cohorts reach their forties. It is not yet known. Projecting where these younger cohorts will end up should also consider the stability of completed childbearing, which we document for at least three decades in Finland, the Netherlands, and the United States. Completed childbearing in Spain

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<sup>8</sup> Recently, Dutch demographers have also pointed to problems on the Dutch housing market as a potential explanation for declining TFR since 2010 (Van Wijk and Feijten, 2025; Van Wijk and Feijten, 2026).

is falling and shows evidence that family sizes may continue to fall, but this has not been the case in the other countries we study.

For cohorts that have completed their childbearing, family size has converged around a two child-norm across all four countries studied. The emergence of the two-child family as the modal outcome may reflect evolving social norms and the economic realities facing modern households. Understanding why many families stop at two children—and why some stop at fewer—has become central to explaining fertility dynamics in the twenty-first century. These patterns underscore the importance of moving beyond period fertility measures when evaluating demographic change. A cohort perspective and microdata provide a richer understanding of how families form and how fertility decisions unfold over the life course. As researchers and policymakers grapple with the implications of population aging and sustained low fertility, this broader perspective is essential for understanding both the causes and the consequences of demographic change in high-income societies.

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## Appendix

Completed childbearing is constructed by dividing the number of children ever born by the number of women in the relevant cohort. This Appendix explains how these measures are constructed across time and place.

### Finland

For Finland, completed childbearing is constructed using a combination of population censuses and register-based microdata from Statistics Finland. For cohorts born between 1948 and 1984, we use the full population censuses of 1970, 1975, 1980, and 1985, complemented by annual register-based microdata covering the period 1987–2024. These data include all individuals permanently residing in Finland at the end of the given year. They are linked to child identifiers from the intergenerational register of children born from 1955 onward, allowing us to compute the number of children ever born for each individual. We restrict the sample to native-born women and exclude women who permanently emigrated or died before age 40. We combine information from all data sources for each individual and then construct the cohort mean number of children ever born to women aged 40 to 76. Because women who are in their 40s may still give birth, children ever born will be slightly understated for cohorts on the younger side of this age range. For cohorts born 1906–1925, completed childbearing is calculated based on fertility history by 1970 (ages 45 to 64), which is observed in the 1970 census 10-percent fertility sample (Central Statistical Office of Finland 1975). For cohorts born 1926–1947, these fertility histories are supplemented with subsequent births after 1970 from the full population register data.

*Institutional Context:* In Finland, industrialization began in the late 19<sup>th</sup> century, but the majority of the population remained rural, uneducated, and engaged in agriculture until WW2. This slow transformation was reflected in the high but declining TFRs of the early 20<sup>th</sup> century, briefly interrupted by the Finnish Civil War of 1918. During WW2, three periods of active war mobilized most young men and led to large fluctuations in fertility dynamics during and right after the war. Wartime pro-natalist rhetoric supported pro-natalist policies, such as free municipal prenatal and child health care, which were expanded to cover the country right after the war (Olkkola 2024). The birth cohorts of 1946–1950 were

the largest ever, and fertility remained above replacement level until the end of the 1960s. The structural transformation of the country accelerated in the 1950s, and educational levels began rising: for the first time, more than half of females attained more than compulsory schooling in the early 1960s.<sup>9</sup> The Nordic welfare state began to emerge in Finland in earnest in the 1960s, when, for example, universal health insurance and paid maternity leave were introduced. Fertility levels stabilized, but recent decades have experienced diverging patterns by socioeconomic status: highly educated women and men increasingly follow a two-child norm and exhibit relatively stable completed fertility, whereas the low educated experience both rising childlessness and more higher-order births than the highly educated (Jalovaara et al. 2019; 2022). These developments are consistent with broader Nordic patterns in which gender equality and institutional support for combining employment and childrearing reduce opportunity costs of childbearing among highly educated individuals (Nisén et al. 2025). Recent fertility decline in Finland has been particularly pronounced since 2010 and has affected most educational and age groups. Declining first birth rates have contributed substantially to falling cohort fertility, indicating that recent changes are not driven solely by postponement but also reflect potential reductions in completed fertility (Jalovaara & Miettinen 2025).

### The Netherlands

In the Netherlands, fertility indicators are computed from a combination of administrative microdata and the 1971 population census. The administrative microdata of Statistics Netherlands includes information on all individuals and their children who ever lived in the Netherlands between 1995 and 2024.<sup>10</sup> Because we may miss individuals (and their children) who died or migrated before 1995, we use the microdata to compile fertility indicators for cohorts 1931–1980, and complement this with information from a population census for earlier birth cohorts 1901–1930. The 2024 parent-child registry is used to link parents to children, so fertility indicators for these cohorts are observed until the likely end

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<sup>9</sup> Authors' calculations based on Statistics Finland FOLK data modules.

<sup>10</sup> Administrative microdata are restricted and only available with approval. For further information, see Statistics Netherlands website <https://www.cbs.nl/en-gb/our-services/customised-services-microdata/microdata-conducting-your-own-research> (accessed April 19, 2026).

of their reproductive years. Migration may affect the observed counts of births and women used to calculate fertility indicators, as not all births before or after migration are observed. For this reason, the sample is restricted to women who were born in the Netherlands. Native women (and their children) who spend most of their childbearing years abroad (i.e., women who emigrated before age 20 and did not return before age 40) are also excluded from the sample. We use the 1971 census to compile fertility indicators for women aged 41–70 at the time of the census. Given that the census only asks *ever-married women* about the number of live births they ever had, we assume zero live births for *never-married women*.<sup>11</sup>

*Institutional context:* In the Netherlands, the declining TFR was interrupted by WWI and the onset of the Spanish flu in 1918/1919. Although the Netherlands was neutral during WWI, men were away from home to protect the country's neutral status, which may have led to a small baby boom after their return and after the Spanish flu in 1918/1919, thereby increasing the TFR (De Graaf, 2008). The TFR declined further after this period and stabilized briefly during the Great Depression of the 1930s. Economic conditions were poor throughout the 1920s and 1930s. Because economic conditions shaped marriage patterns and out-of-wedlock childbearing was uncommon, the TFR was low during this period. The TFR increased slightly after the Nazi occupation of the Netherlands in 1940, which can be attributed to an improvement in economic conditions in the first war years (compared to the poor conditions before the war) as well as pro-family policies introduced by the occupying authorities. A famine in the final year of WWII led to a dip in the TFR, which was compensated by an increase in births after WWII, leading to a large uptick in the TFR after the war (Zwiers, forthcoming). The economic boom of the 1950s and 1960s led to more marriages, and marriages at younger ages, and relatively high birth rates in this period.

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<sup>11</sup> The 1971 census had not been previously used for compiling fertility indicators because of missing information on the number of live births for never-married women (Zeman, 2020). We follow Bailey et al. (2014) and Bailey (2025) by assuming zero fertility of never-married women. This approach is justified by several observations. First, nonmarital childbearing was below 2 percent of all live births between most of the 1920s and 1960s. In addition, a large share of women with nonmarital births likely married subsequently. Third, nonmarital childbearing was stigmatized, so women who had never been married and had a child were unlikely to have told the census about this (e.g., misreport having a child or misreport having been married). For these reasons, comparisons of completed cohort fertility are almost equivalent to those from De Graaf (2008), who observes all childbearing using different non-public historical data sources from Statistics Netherlands. Most national data collection on fertility indicators (including age at first birth) began in 1950 (Van Gaalen and Van Poppel, 2007). By using information from the 1971 census, we can examine completed cohort fertility for birth cohorts dating back further in time

The drop in the TFR after 1970 can be explained by the liberalization of oral contraceptives for young women in the Netherlands (Marie and Zwiers, 2025).

### Spain and United States

In Spain and the United States, these historical series are largely computed from the population censuses and augmented using modern fertility surveys. In the United States, the decennial census asked women how many live births they had ever had. Before 1970, this question was only asked of *ever-married women*. In 1970–1990, the decennial census asked *all women*, regardless of marital status, about their live births. We use this question but restrict the sample to women ages 41 to 70 at the time of the census and, before 1970, assume that never-married women had zero children.<sup>12</sup> We supplement the census estimates using the 1976–2023 June Current Population Survey (CPS), Fertility and Marriage Supplements. In 2018, the CPS changed the top codes for the children ever born measure, heaping all women who have more than 5 children into a single category. To account for this change, we used 1970–1976 cohort distributions to adjust the 1980 cohort. We then construct the mean number of children ever born for each year-of-birth cohort.

For Spain, we combine the decennial censuses of 1981, 1991, and 2011, and the survey accompanying the 2021 census (ECEPOV), which all ask about the number of children women ever had. In the 1981 census, this question was only asked of *ever-married women*, so we impute zeros for children among never-married women. In the other data sources, they asked *all women*, regardless of marital status, about their live births. We restrict the sample to women ages 40 to 70 at the time of each census (or survey) and, when using the 1981 census, assume that never-married women had zero children.

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<sup>12</sup> This approach follows Bailey et al. (2014) and Bailey (2025). One might be concerned that never married women had children non-maritally; that women in their early 40s go on to have children after the census; and that, among older women, mortality-based attrition may affect rates of childbearing. Multiple adjustments for these issues affect the overall patterns of fertility change and the levels of childbearing very little.