



Wittgenstein Centre

FOR DEMOGRAPHY AND  
GLOBAL HUMAN CAPITAL



# Age, Infertility and Assisted Reproduction in a changing society

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# This talk

- Delayed childbearing and implications **for individuals** and **for fertility levels**
- May **biological constraints** become more **prominent**?
  - Elements suggesting that more women may be experiencing infertility as childbearing is being postponed
- Definition: **fertility** (to speak of the number of children women have) and **infertility** (issue to conceive)
- Data about women, but men are important actors

# Data sources

- Human Fertility Database
  - Aggregate data on fertility across countries
- Generations and Gender Surveys
  - Detailed (individual) data on reproductive intentions and on past experience of infertility
  - 7 countries, 2020s
- Country surveys
  - Austrian microcensus (series of 7 surveys)
  - Others

Increase in  
average age at  
first birth



# People have children later and later in the high-income countries

- People did not have children at earlier ages
  - Longer time spent studying
  - Economic uncertainty, youth unemployment
  - Competing activities
- New reasons to have children late
  - Longer life expectancy
  - Change in partnership and repartnering
  - Change in values and attitudes

(Adsera 2017;  
Kreyenfeld & Pailhe 2015)

(Testa 2017)

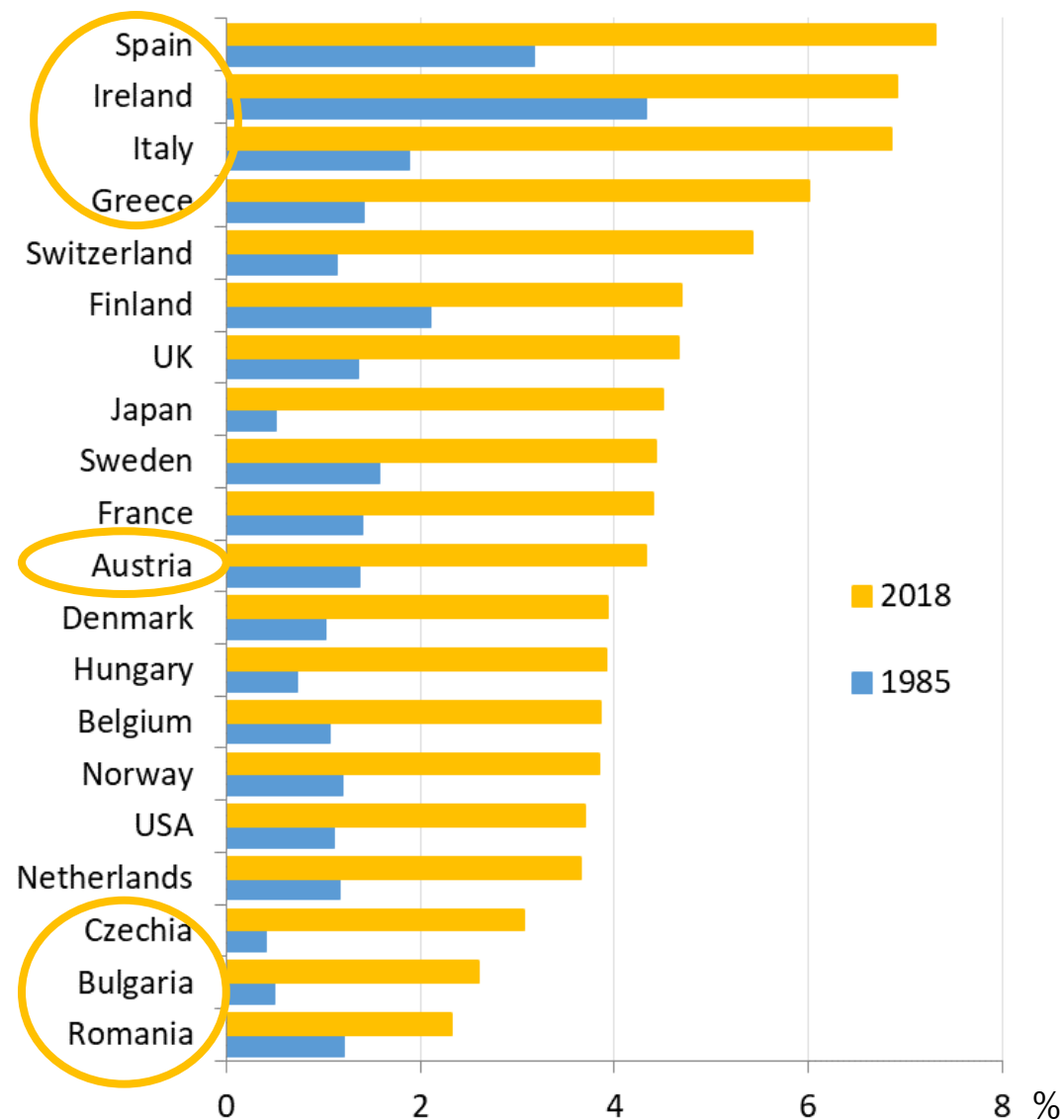
(Beaujouan & Toulemon  
2021)

(Van Bavel et al. 2012)

(Lesthaeghe 2010)

# Remarkable increase in childbearing from age 40 across Europe, the US and Japan

Figure. Share of fertility rates at ages 40+ in total fertility; selected European countries, 1985 and 2018



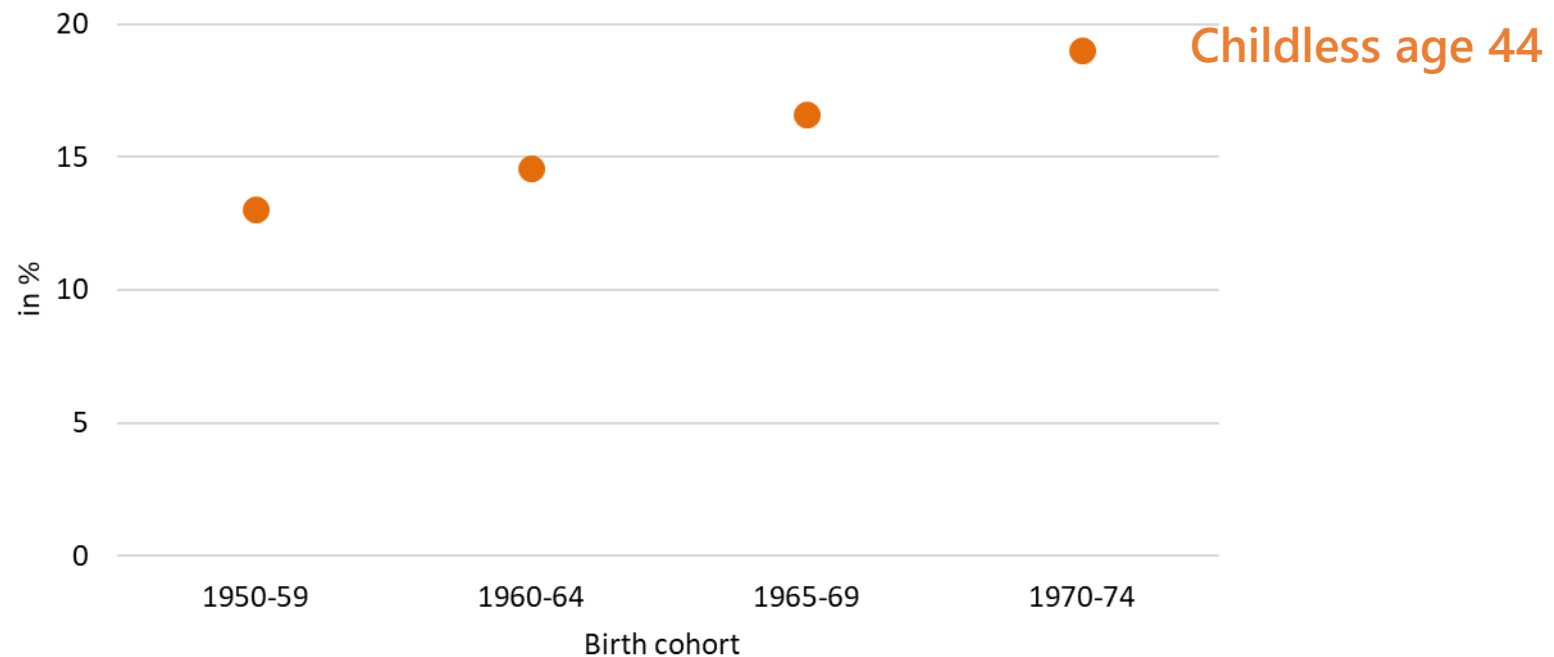
Source: Beaujouan and Sobotka  
Data: EUROSTAT + Human Fertility database

# Fertility (intentions) at later ages



# Increase in childlessness over time in Austria: maybe people no longer want to have children?

Figure. share childless  
at age 44,  
by birth cohort, Austria,  
all women

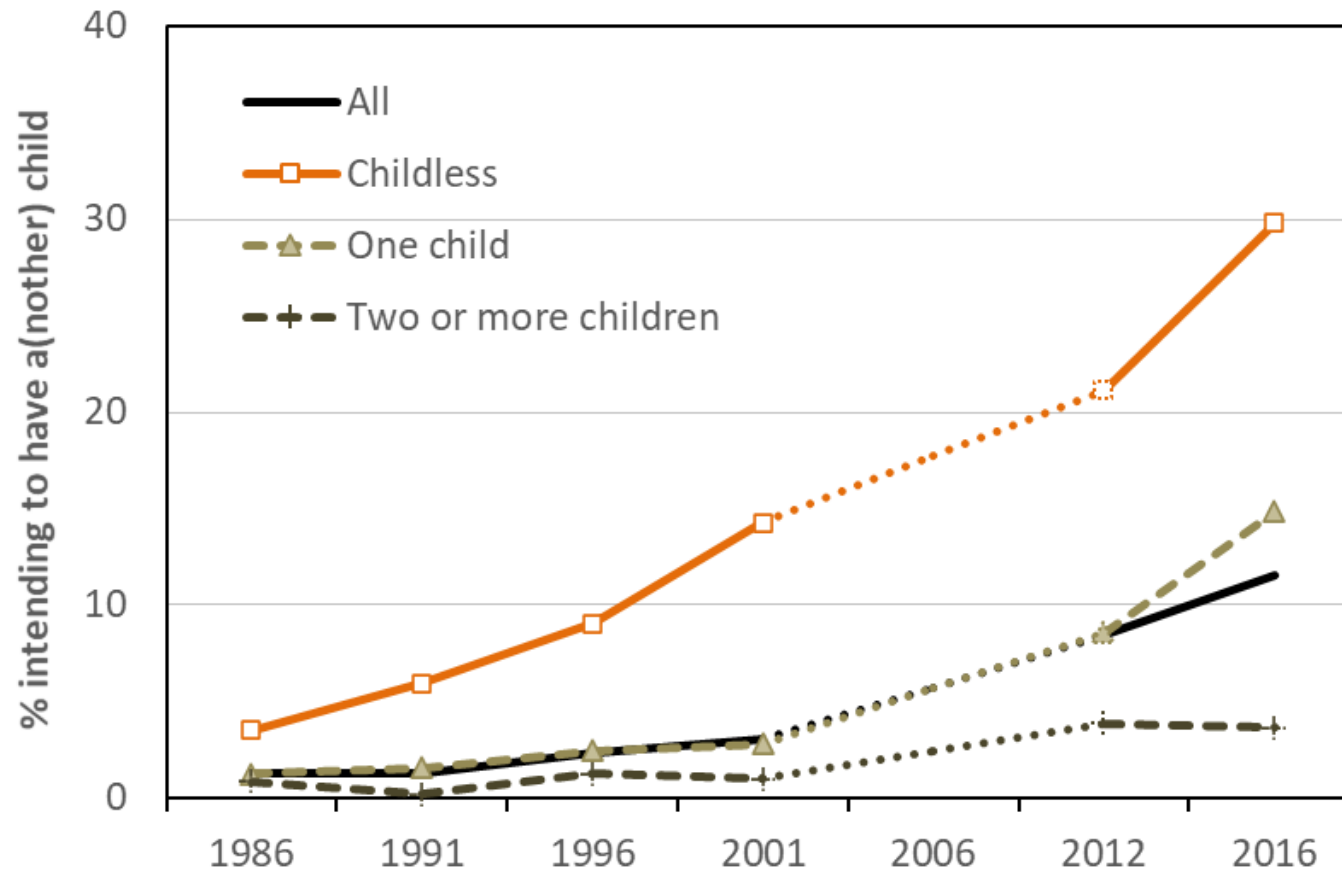


Source: Beaujouan 2018  
Data: Austrian micro-census 1986-2016



# Intentions to have children are postponed: Increase in the share of women aged 40-42 who wish to have a child in Austria

Figure. Share of women aged 40-42 who wish to have a child, by year and parity, Austria, 1986-2016

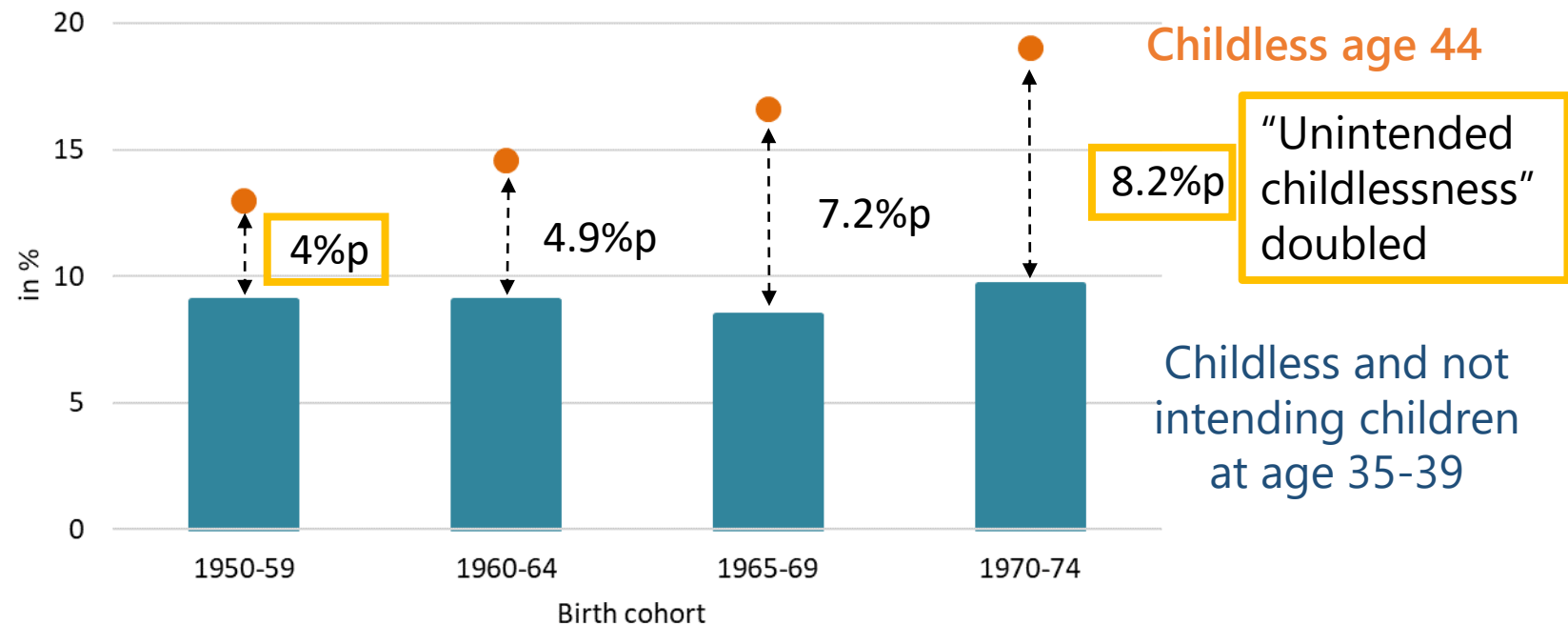


Source: Beaujouan 2018  
Data: Austrian Micro-Census

Q: "Do you wish to have one or several (additional) children ...?"

# Childlessness increases quickly, but in fact the share of all women who want no child at age 35-39 is stable

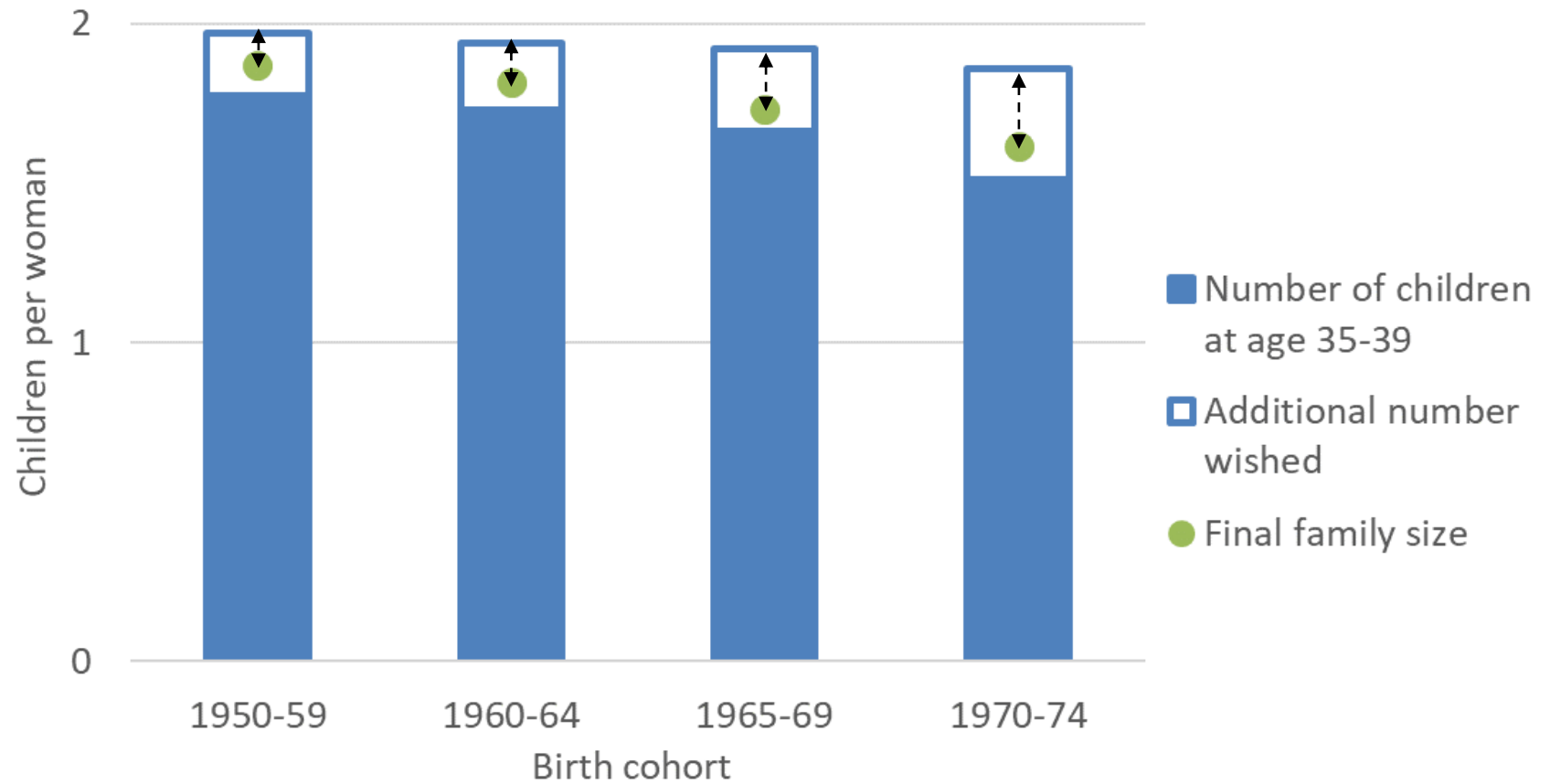
Figure. Share childless and not intending a child at age 35-39 versus share childless at age 44, by birth cohort, Austria, all women



Source: Beaujouan 2018  
Data: Austrian micro-census 1986-2016

# The gap between the number of children wished at age 35-39 and the number had by age 45 also grows

Figure. Mean number of children had and intended at age 35-39, and mean number of children achieved by age 45 by birth cohort, Austria, all women



Source: Beaujouan 2022  
Data: Austrian micro-census 1986-2016

Touching the  
(biological) limits?

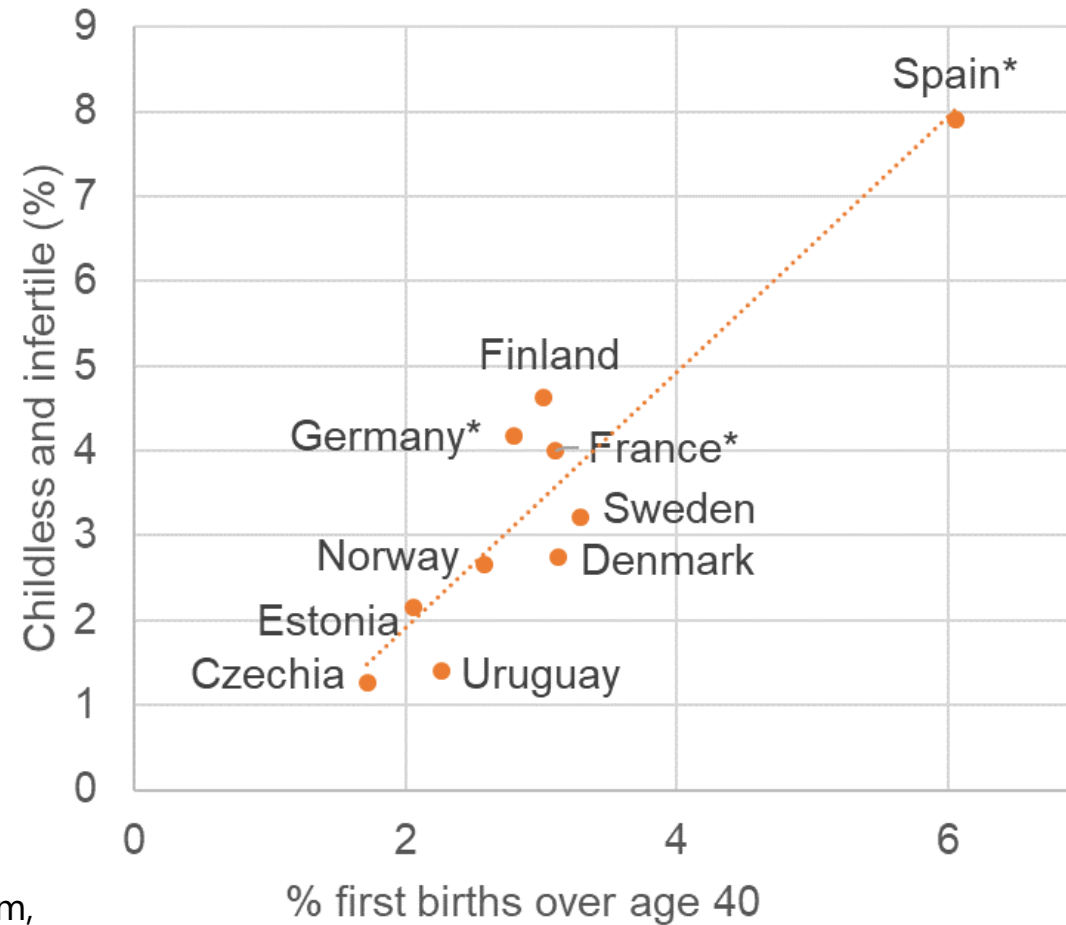


# Linking later fertility and infertility

- At the individual level, women who start trying to have a child late are less likely to have children by the end of their reproductive life
  - Because of the decrease with age in capacity to have a live child (e.g., Leridon 2004)
- But little way to assess directly whether childlessness is due to fertility delay
  - Because in most data, we don't know at what age people start trying to have a child
- Do more people struggle to have a child in countries where births are more delayed?

# More women end up childless with declared infertility in countries with later fertility

**Figure.** Proportion of women biologically childless at age 40-59 versus share of late first births, across countries, 2020s



- Between 1.3 and 8% of women are childless and declare infertility issues
- ART already available

**Data.** GGP II, \* Spanish fert survey, pairfam, Fecond. HFD, Cabella et al. 2023

**Field.** All respondents, weighted

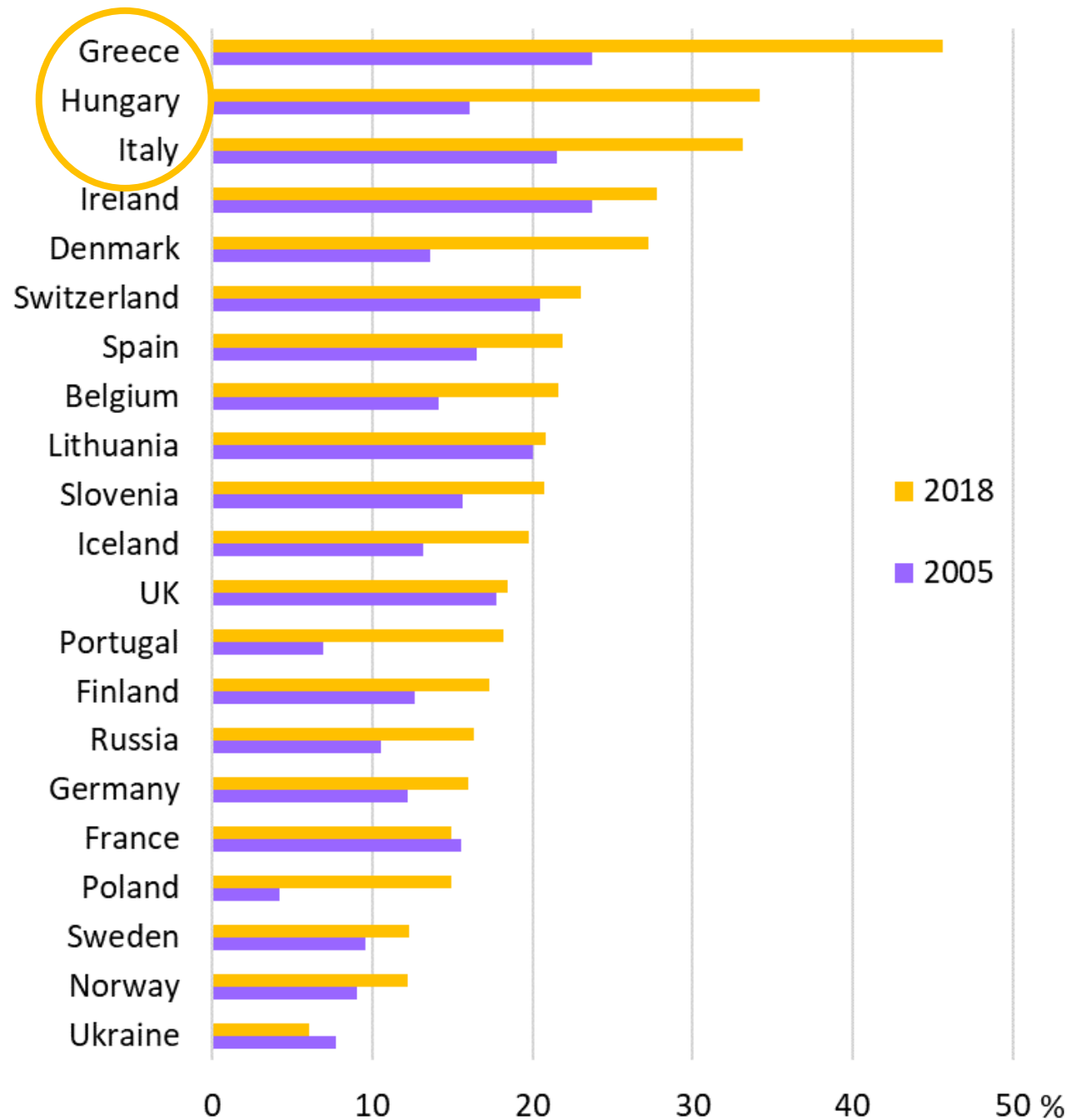
**Ackn.** Shalini Singh, MC Compans, Ester Lazzari

An illustration of a woman with long, wavy blonde hair, wearing a pink jacket over a light-colored top and brown pants. She is pushing a shopping cart filled with items, including a red bag and a green book with the letters 'A.R.T.' and a small icon of a baby. The setting is an airport terminal with large windows in the background showing an airplane taking off. Other people are visible in the background, including a woman with a child on her shoulders.

Use of medically  
assisted reproduction  
at later ages

# Across Europe, about 15% of IVF/ICSI treatments to women 40+ in 2005, 22% in 2018

Figure. Share of aspirations for IVF/ICSI treatments at ages 40+; selected European countries, 2005 and 2018



Note. Cross-borders ART frequent in Belgium, Spain, Czech Republic, Denmark...

Data. Assisted reproductive technology in Europe, results generated from European registers by ESHRE



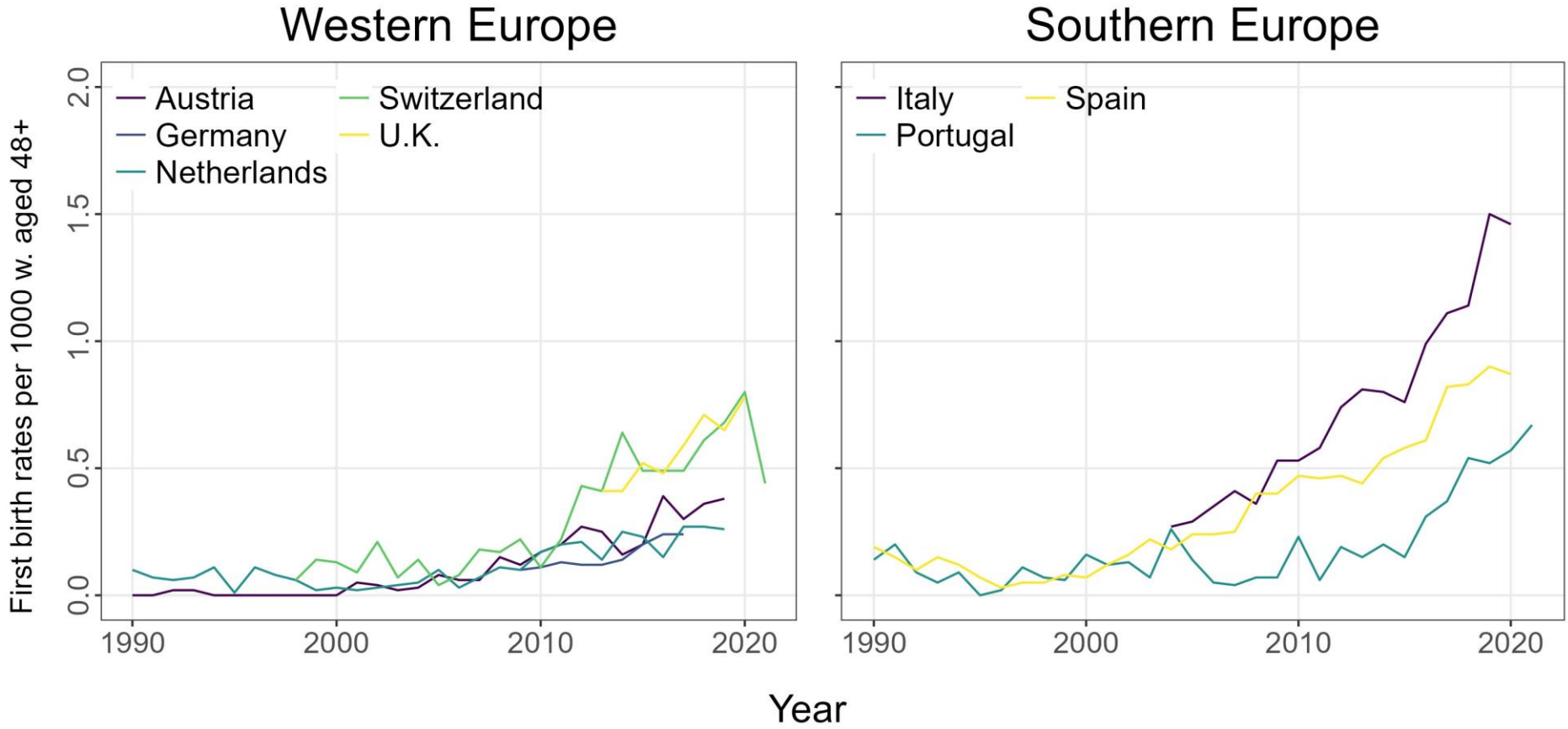
# ART births contribute much to fertility at older ages (Australian example, including donor eggs)

Figure. Contribution of ART births to cohort fertility rates, for the 1968 (observed) birth cohort and the 1986 (projected) birth cohort, Australia

	Contribution of ART to fertility	Contr. ART 30-39 to fert 30-39	Contr. ART 40+ to fert 40+
Cohort 1968	2%	3.9%	10.4%
Projected cohort 1986			
Constant success and treatment rates	4.2%	5.8%	20%
Extrapolated success and treatment rates	4.8%	6.4%	25%

# More and more births beyond the biological limits (mostly linked to Medically Assisted Reproduction)

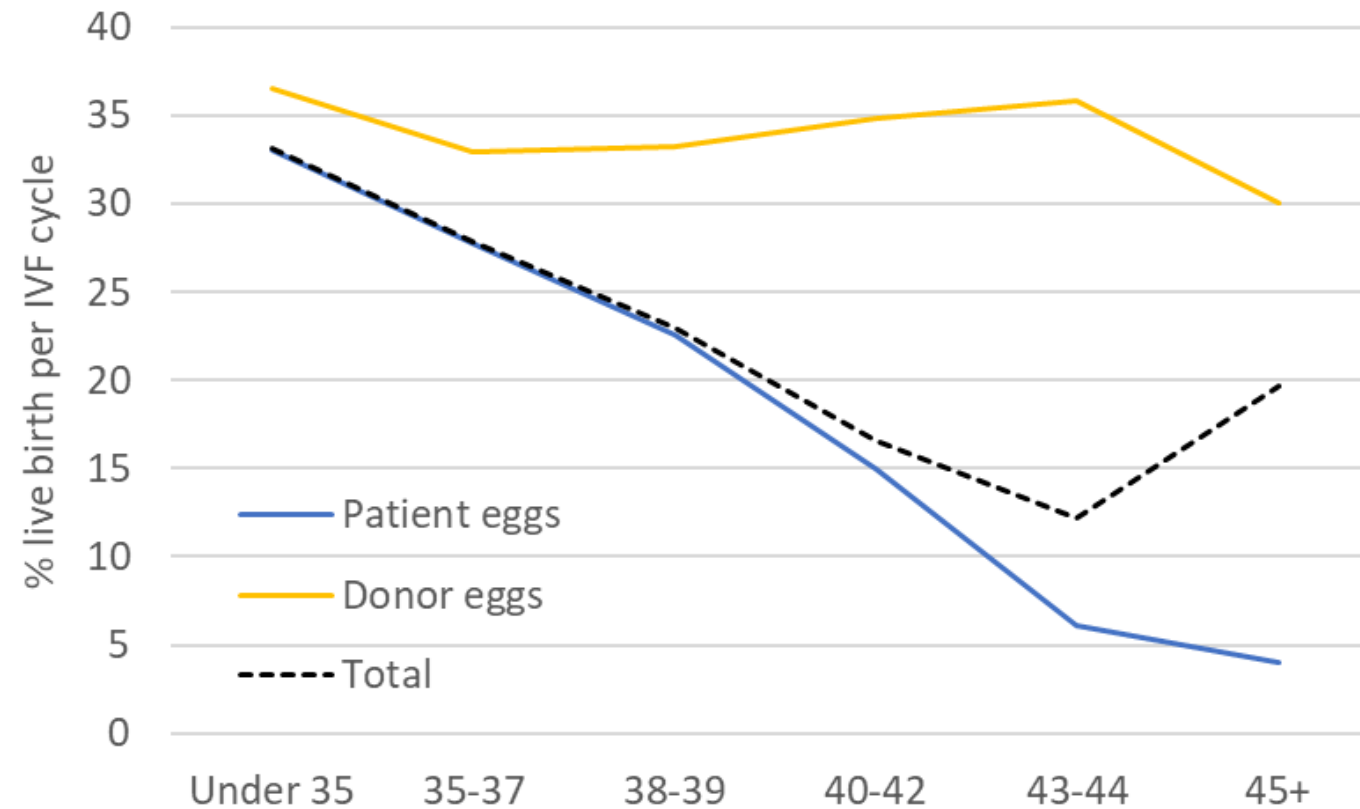
Figure. First birth rate for all women ages 48+, selected European countries



Data: HFD, <https://www.humanfertility.org/>

# Success rate of In Vitro Fertilisation decreases strongly with age, except with donor eggs

Figure. Live births per IVF treatment by age, UK, 2018



Source: Beaujouan and Sobotka (2018)  
Data: HFEA

# Discussion



# Summary

- People are having their children later and later in most high-income countries
- In Austria, we observed that an increasing number of women are not having the children they wish at later ages
  - In particular, the proportion of childless people wanting a child late but not having it increased strongly
- Eventually, 1-8% of people tried to have a first child but did not manage
  - This share was larger in countries where fertility was postponed most
  - A growing proportion of people may be reaching biological reproductive limits
- Assisted reproduction is increasingly used at later ages
  - Its contribution to fertility rates is projected to increase
  - But it is subject to age constraints, like biological infertility

# Concluding remarks (1)

## Implications of late fertility

- For family size
  - In large part, the fertility decline remains linked to change in fertility behavior and not to biological constraints
  - But variation across contexts, extreme cases of Italy and Spain
  - **Decreasing room for further fertility delay**, depending on stage of fertility postponement
- For individuals
  - In non-extreme cases, many people may still manage to have the first child they wish, but less often further children because they will be starting “too late”
  - More frequent use of IVF and donor eggs, also prone to fail
  - More complex and distressing reproductive experience
- Overall, biological limits will certainly become increasingly important in the future reproduction landscape

# Concluding remarks (2)

## Assisted Reproduction

- ART partly offsets some of the fertility decline due to delayed childbearing
  - But we do not expect this to be enough to allow people to have all the children they want at later ages (Habbema et al. 2015)
    - Because as we have seen, the success rate of IVF is much lower in women in their 40s
    - The gap between intentions and fertility continues to grow
  - The “compensatory” effect will vary across countries
    - Cross-country variation depending on the use of donor eggs and social egg freezing
    - Different rules on age limits of access to ART/ reimbursement
- Access and use of ART is not universal
  - ART is expensive: postponed fertility leaves people behind
  - Paths to conception through ART are more physically and emotionally complex
  - And old age remains a negative risk factor for pregnancy outcomes

# Concluding remarks (3)

## Policy implications

- To try to ensure that even more people have the children they want, it would be important to
  - Encourage governments to create a generally family-friendly environment (childcare, male time for the family...), so that people feel supported in their childbearing plans early on
  - Improve individual knowledge about the biological limits of reproduction so that people can make informed decisions about their family plans





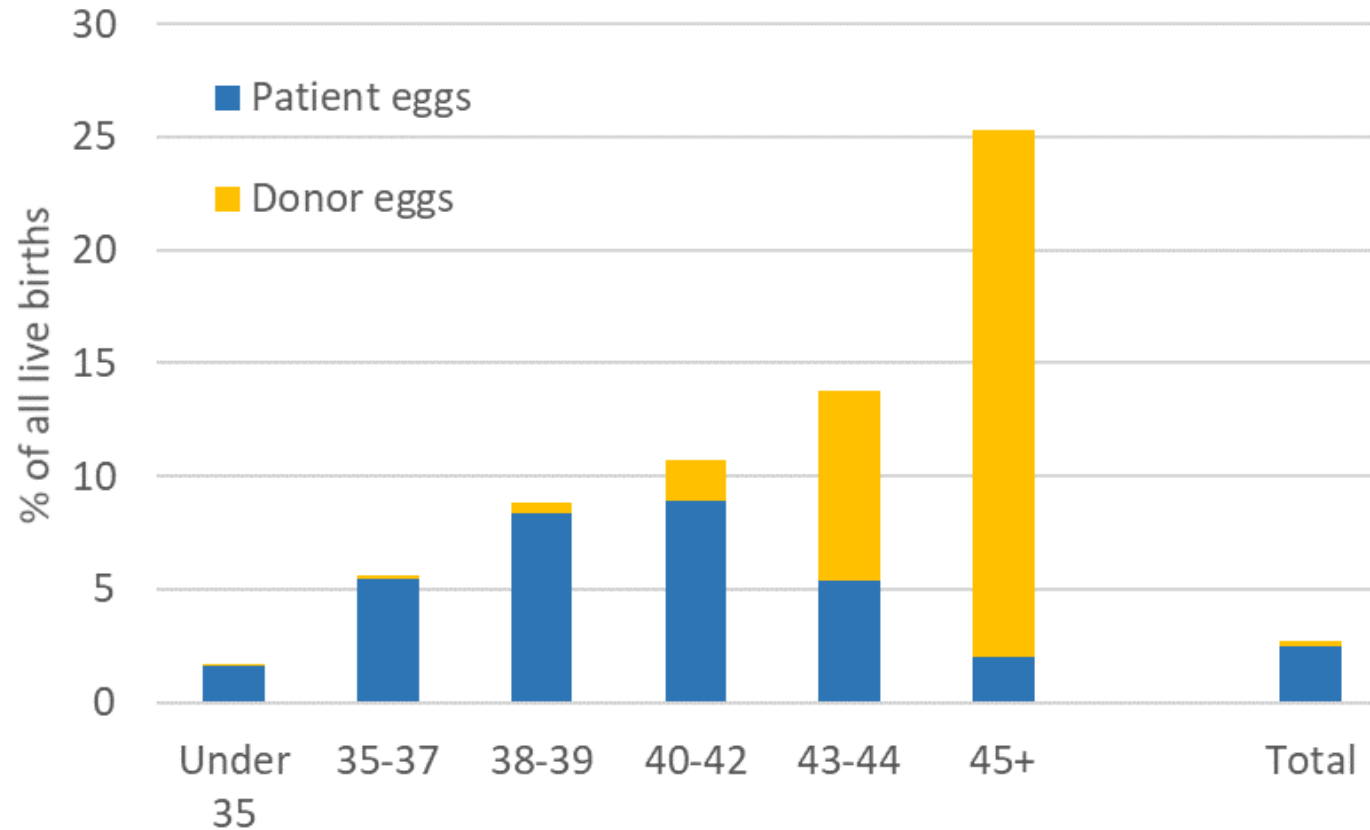
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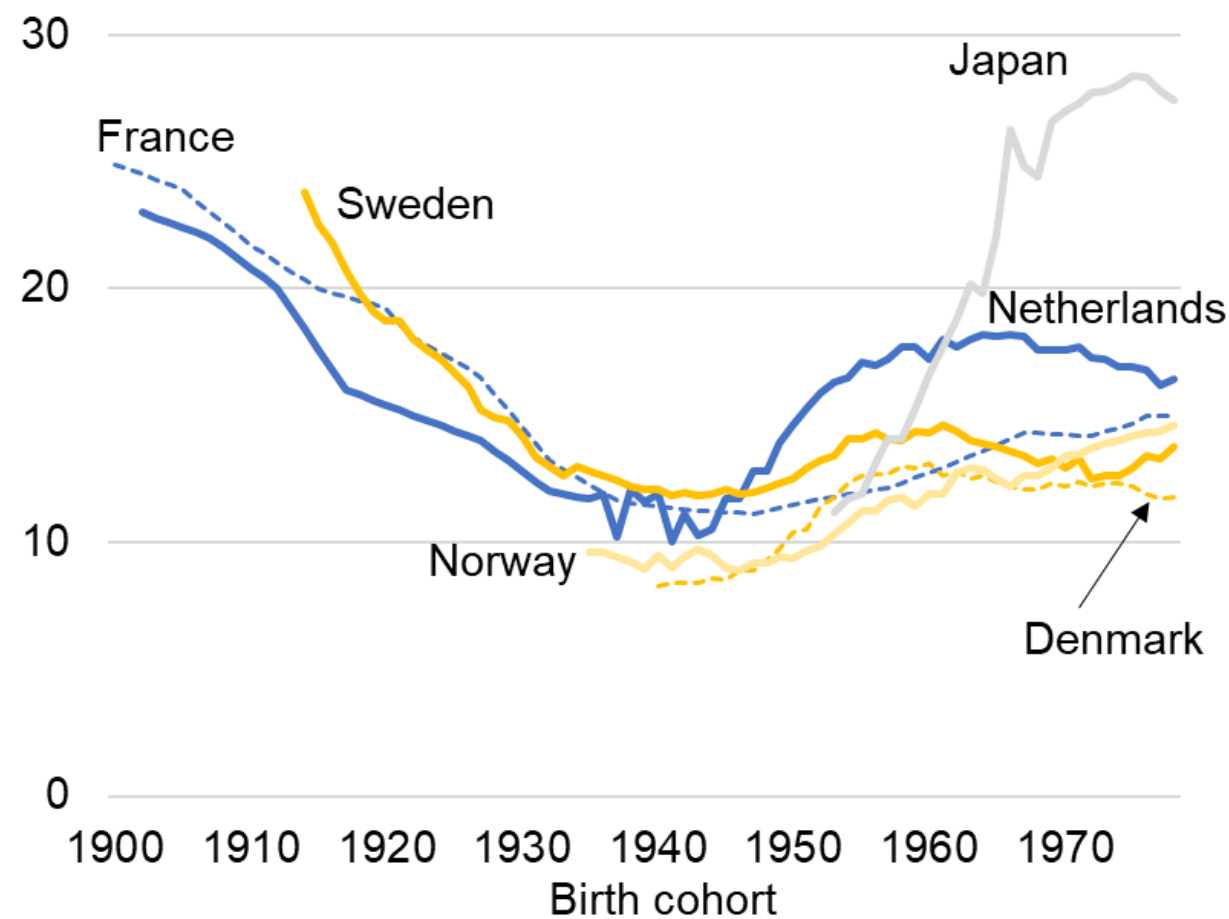
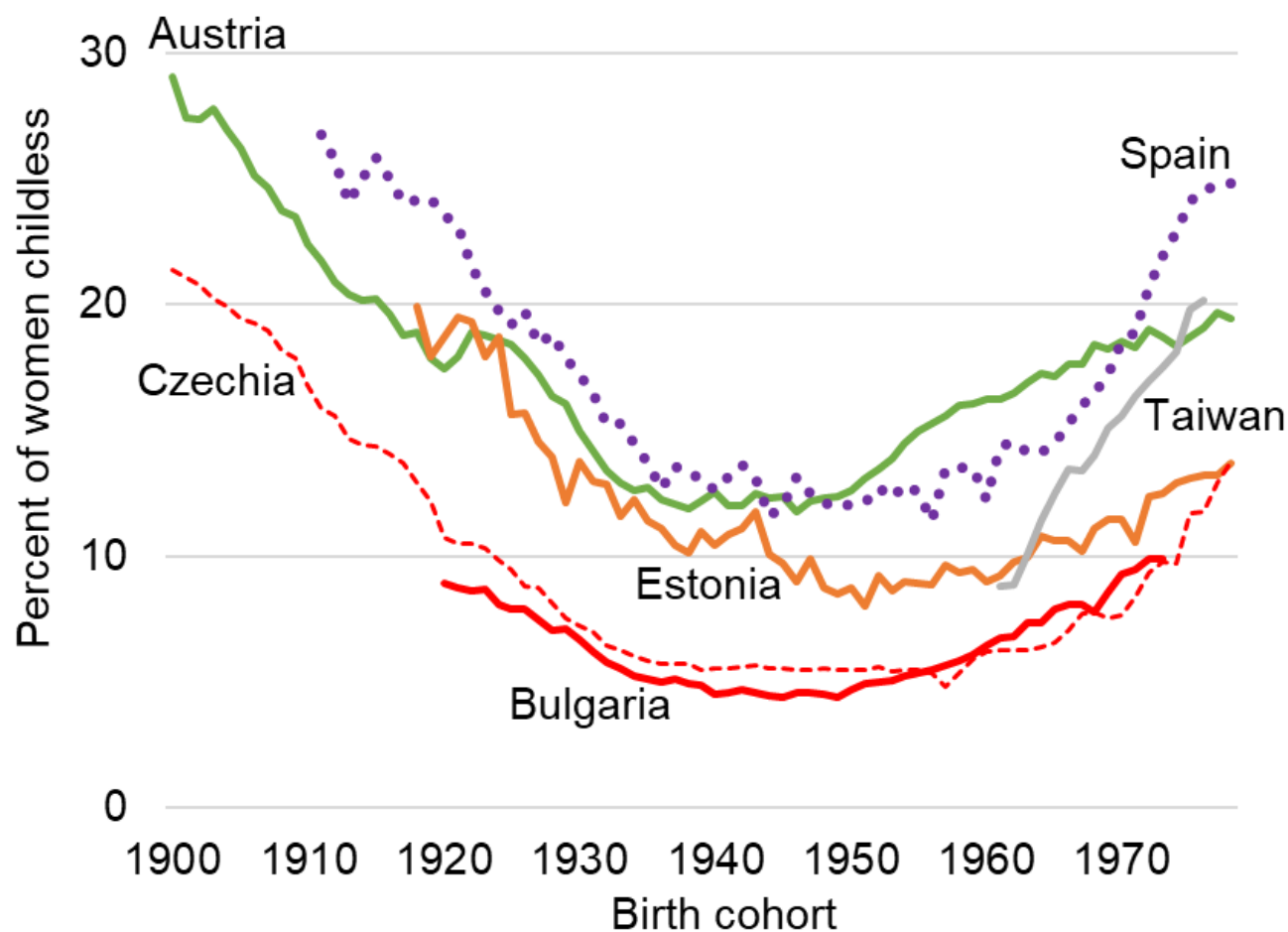
# Share of live births resulting from IVF surges with age, but most of them are with donor eggs after age 43

Figure. Share of all live births by age that follow an IVF treatment, UK, 2018

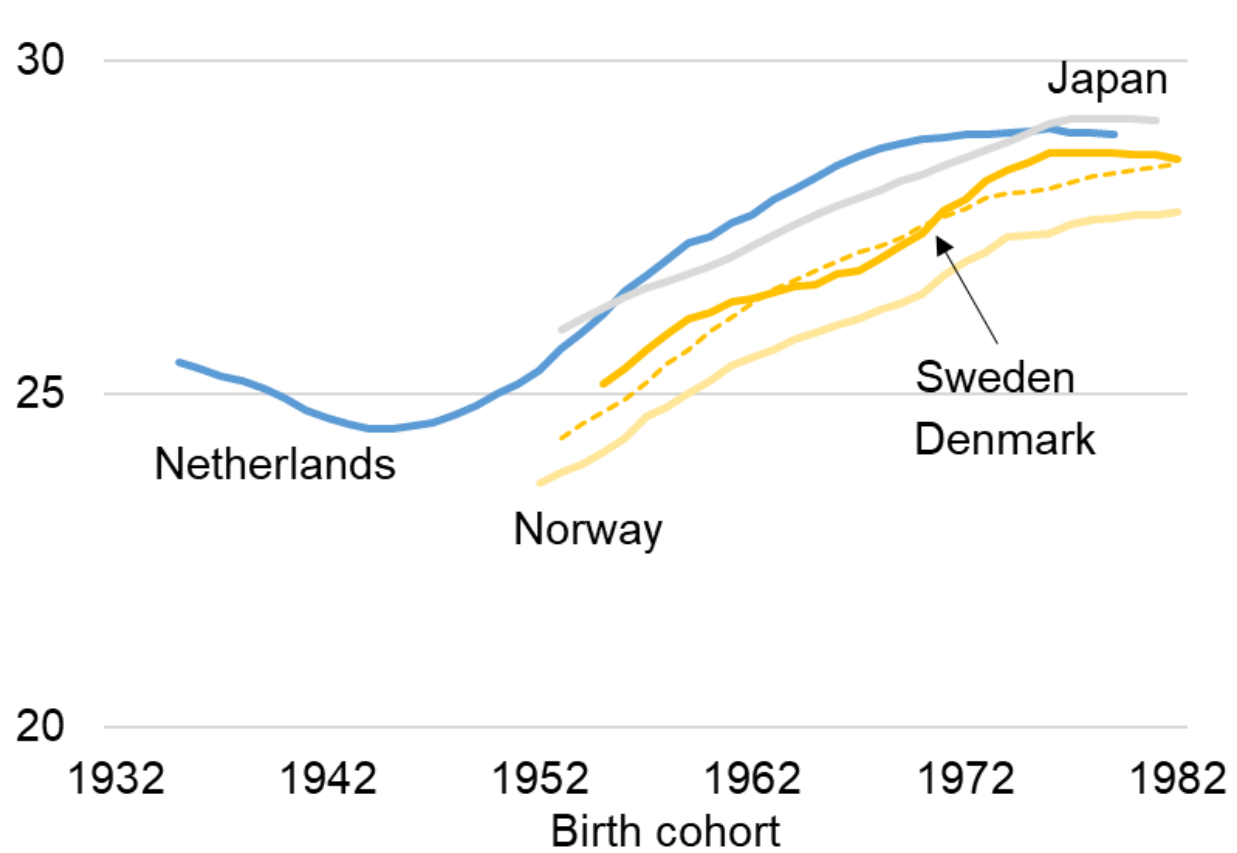
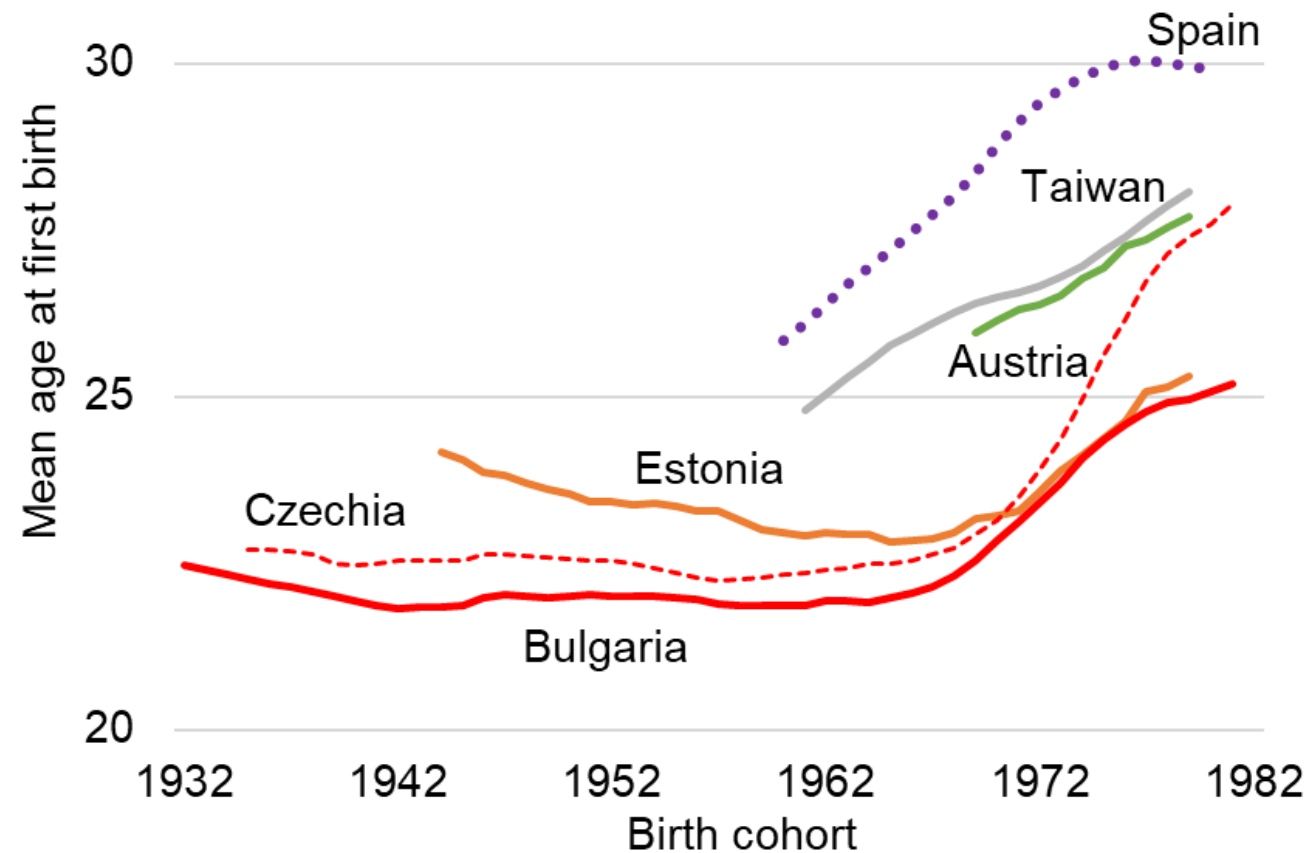


Source: Beaujouan and Sobotka  
Data: HFEA, HFD

# Trends in share of childless women, 1900-1980 birth cohorts

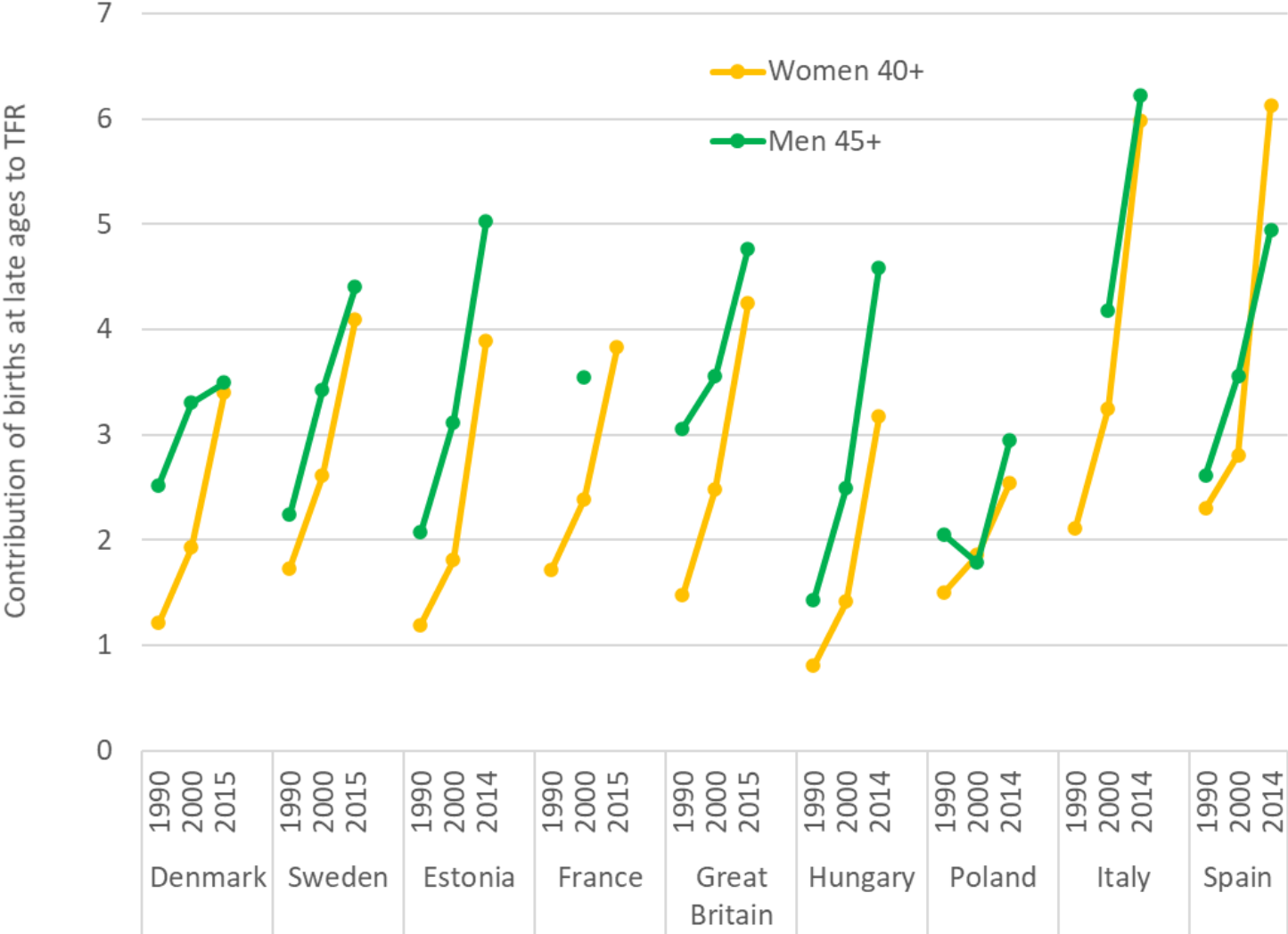


# Trends in mean age at first birth, 1932-1982 birth cohorts



# Increase in very late fertility for both men and women

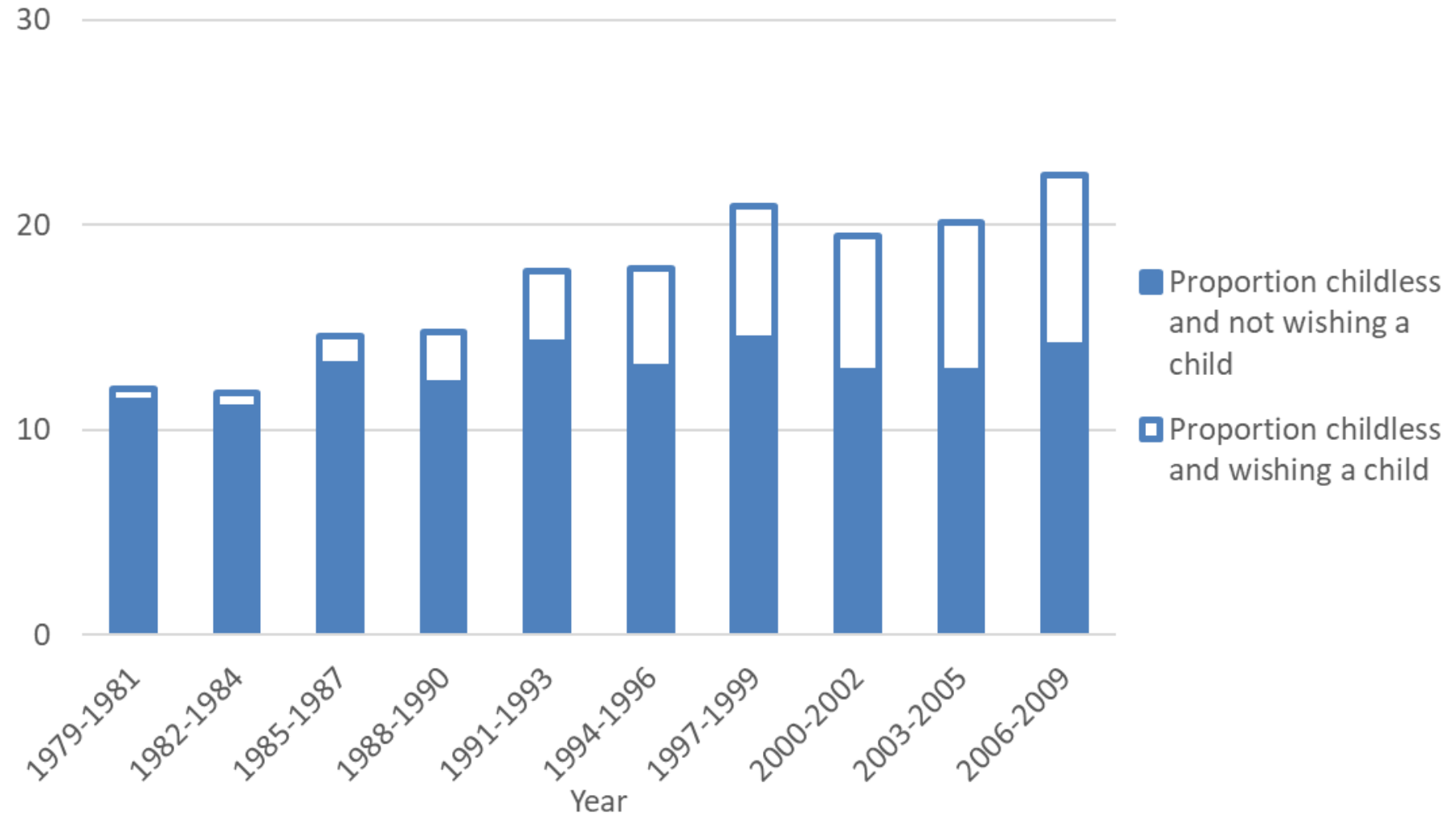
Figure. Contribution of births at age 40+/45+ to TFR; selected European countries, 1990 to 2015, women and men



Data. Human Fertility Database (HFD, HFC, special collection on men)

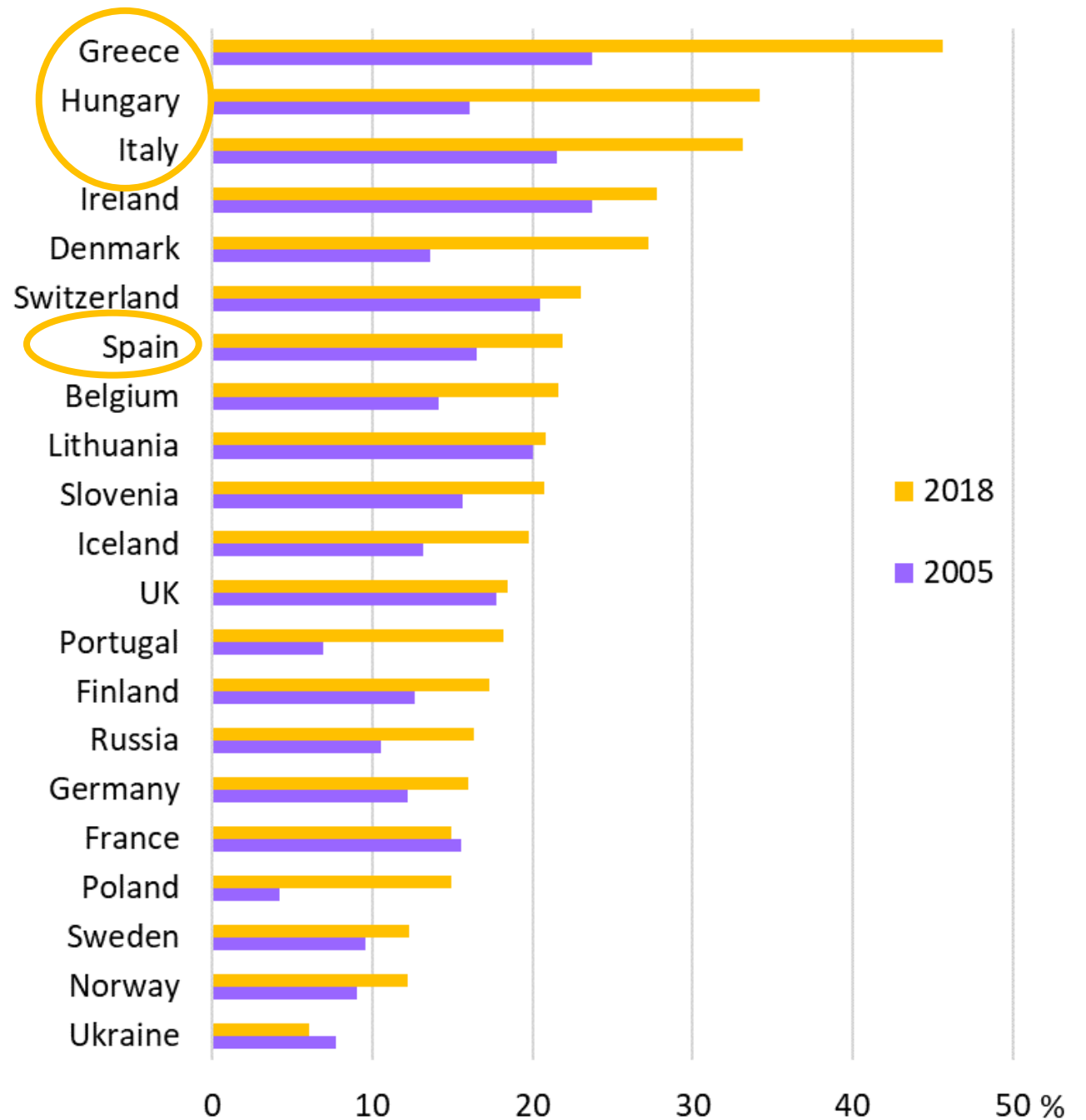
# An increasing proportion of women are childless at age 35-39 and still want a child (UK example)

**Figure.** Share of women aged 35-39 in the United Kingdom (1979-2009) who are childless, decomposed between those who want a child and those who do not



# Across Europe, about 15% of IVF/ICSI treatments to women 40+ in 2005, 22% in 2018

Figure. Share of IVF/ICSI treatments at ages 40+; selected European countries, 2005 and 2018



Note. Cross-borders ART frequent in Belgium, Spain, Czech Republic, Denmark...

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