Are age limits for assisted reproduction adapting to late fertility trends?

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Background

Since the 1980s in high-income countries, the usage of medically assisted reproduction (MAR) has considerably increased (Adamson 2009). Initially, infertility treatments were designed to address specific biological conditions hindering couples from conceiving. Over the decades, this phenomenon has become progressively intertwined with another trend, the rise in the age at which births occur, particularly at late ages (Beaujouan 2020). For this reason, MAR has emerged as a response to the age-related decline in fecundity.

Against this backdrop, there is a significant impact of MAR use on births, notably on late childbearing. Between 1980 and 2000, the share of births at age 35 or over rose in countries like Austria, Sweden and the US, and this has been partly attributed to the greater use of assisted reproduction (Sobotka 2013). A substantial contribution of MAR births at old reproductive ages (35+) has also been found in Norway (Goisis et al. 2020), or in Australia where MAR births among women aged 45 years old or older have gone from 6% to 30% between 2010 and 2017 (Lazzari et al. 2021).

There are broad cross-country variations in the extent to which infertility treatments are used (Präg et al. 2017) and have an impact on (late) births (Devolder and Borisova 2022). One of the main explaining factors is the availability of medical interventions, which increases when techniques are legally allowed, publicly covered (Abramowitz 2017; Esposito et al. 2023) and with few limitations (Sobotka 2013). Access limitations notably rely on women's age and greatly vary across countries (Berg Brigham et al. 2013; Calhaz-Jorge et al. 2020).

This paper focuses on age limits to access medical interventions and their public reimbursement. From the onset of medical practice and its regulation, debates have revolved around whether age limits should be implemented and with which thresholds. Reasons in favour of (strict) age limits rely on the decreasing success rates of MAR with age and the increasing health risks for pregnant women and the foetus, which affect the cost of the treatments for social security systems (Mintziori et al. 2013). Arguments also argue in favour of setting clear age rules for medical practitioners (Klitzman 2016; Martani et al. 2022), question the parenting abilities of older parents (Piek et al. 2023; Singer 2022) and sometimes refer to MAR as techniques that should not surpass the 'natural' biological limits of female bodies (Büchler and Parizer 2017). Conversely, reasons against age limits argue that older parents have advantaged resources (Barclay and Myrskylä 2016) and aim to enhance reproductive autonomy. In some contexts, pronatalist aims also motivate permissive age rules (Büchler and Parizer 2017).

Although decision-making often lacks transparency (Piek et al. 2023), which arguments matter more differ across countries (Büchler and Parizer 2017). In any case, in light of the current tendency to postpone childbearing in high-income countries, the relevancy of age limits

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to access MAR or their public coverage can be increasingly questioned. Surprisingly, scholarly commentary on this matter has been scarce (Büchler and Parizer 2017; Martani et al. 2022; Piek et al. 2023).

Objectives

This paper focuses on the timing of MAR policies based on age rules in high-income countries and compares them to past trends in late fertility (40+). I first ask: How have MAR policies adapted to postponing trends? Consistently or inconsistently? Where have age rules preceded or lagged behind changes in fertility behaviours? Then, the analysis also identifies countries where MAR is more likely to have a demographic impact on late fertility, by focusing on very late births (48+) that have a very low chance of occurring without medical interventions. In addition, I also compare age-based policies to what societies perceive as the social age deadline for childbearing (age norms).

Data

The analysis focuses on direct and indirect age regulation, i.e., on age limits to access 1) infertility treatments and 2) their public reimbursement (Engeli and Rothmayr Allison 2016). I rely on data I collected from country-specific and cross-comparative sources (e.g., Büchler and Parizer (2017) or legal texts) that were cross-checked. So far, I have exhaustive information on the years of adoption and changes in age rules for 20 high-income countries and incomplete information for four countries[2]. MAR access is primarily regulated through indirect measures based on women's age, with countries defining either age limits for treatment access and public coverage, or solely for the latter. Age rules to access treatment public coverage are also consistently more restrictive (ranging between 38 and 46 years old) than direct access restrictions (43-50).

For fertility trends, we use age-specific fertility rates (ASFR) at 40+ and at 48+, retrieved from the Human Fertility Database and Eurostat. Data on average social age deadlines at the country level are from the European Social Survey (rounds 3 and 9), as calculated by Lazzari et al. (2022).

Preliminary results

I compare the timing of MAR policies with (very) late fertility trends. In all the analyzed countries, the implementation of reimbursement schemes for fertility care, although sometimes accompanied by age limits, was followed by an increase in fertility rates at age 40+ (orange lines in Figure 1). I distinguish between six types of countries depending on the timing of the adoption of age rules and trends in the prevalence of late births[3]. I also comment on countries where trends in very late fertility (48+) differ from trends in late fertility (40), which likely reflects a significant influence of MAR (Figure 1):

A. Countries with a *low prevalence of late births from the 1980s onwards and strict age rules for reimbursement*. Poland, Romania and Slovakia have adopted permissive age

[2] Greece, Romania, Portugal and Japan. Data will be completed by information collected in the International Reproduction Policy Database (https://irpd.wzb.eu/).

[3] Age limits displayed on the plots are inclusive (i.e., access is allowed up to this age + 364 days).

limits to access MAR treatments but strict ones (≤40) to access public treatment funding, when late fertility levels were low and still are. These MAR policies are not likely to have much influence on late fertility trends, given the early birth schedules of women.

B. Countries with *permissive age rules adopted when late fertility was prevalent*: Finland and Iceland have no age limits. Italy differs because of a soft age limit to access treatments since 2004 (couples 'potentially in fertile age') and funding is restricted up to age 46 or over depending on the region. Whether MAR contributes to late fertility levels may greatly depend on medical practice in these countries. In Iceland and Italy, births at age 48 or over have particularly risen since the 2010s, but not in Finland.

C. Six countries have adopted *strict age rules to access public coverage* (<43) *when late fertility levels were low, without any change despite a significant increase in late births since then*. Interestingly, France shifted from a soft access limit, referring to 'childbearing ages' since 1994, to a restrictive threshold in 2021 (45 years old). On that matter, Norway is also similar[4]. Social perceptions of the appropriate childbearing age deadline for women played a role in restricting MAR access in the French-speaking European countries (Löwy 2006). In these contexts, MAR may not particularly foster fertility levels at late ages. The increase in very late birth rates has either been parallel or even less pronounced (in France and Japan) compared to fertility rates at 40+.

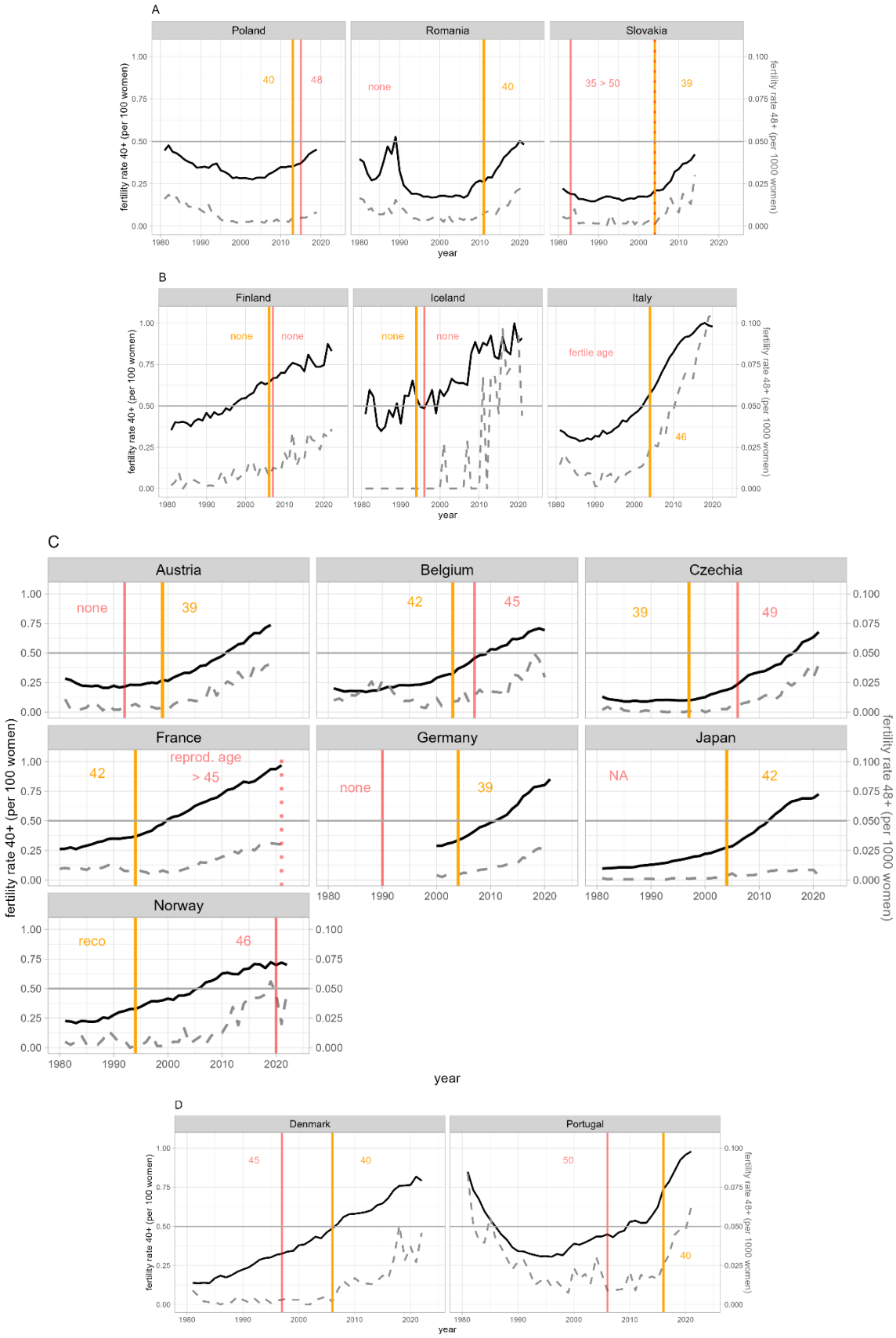
D. Two countries are quite similar to those of the previous group, except that the *strict age limits for public treatment coverage* (40) *were adopted when late fertility levels were relatively high*. While funding rules limit the social cost of MAR, differences in access rules reflect different social perceptions of social age deadlines between Denmark and Portugal[5]. The contribution of MAR to future late fertility trends is also likely to remain the same as in the past.

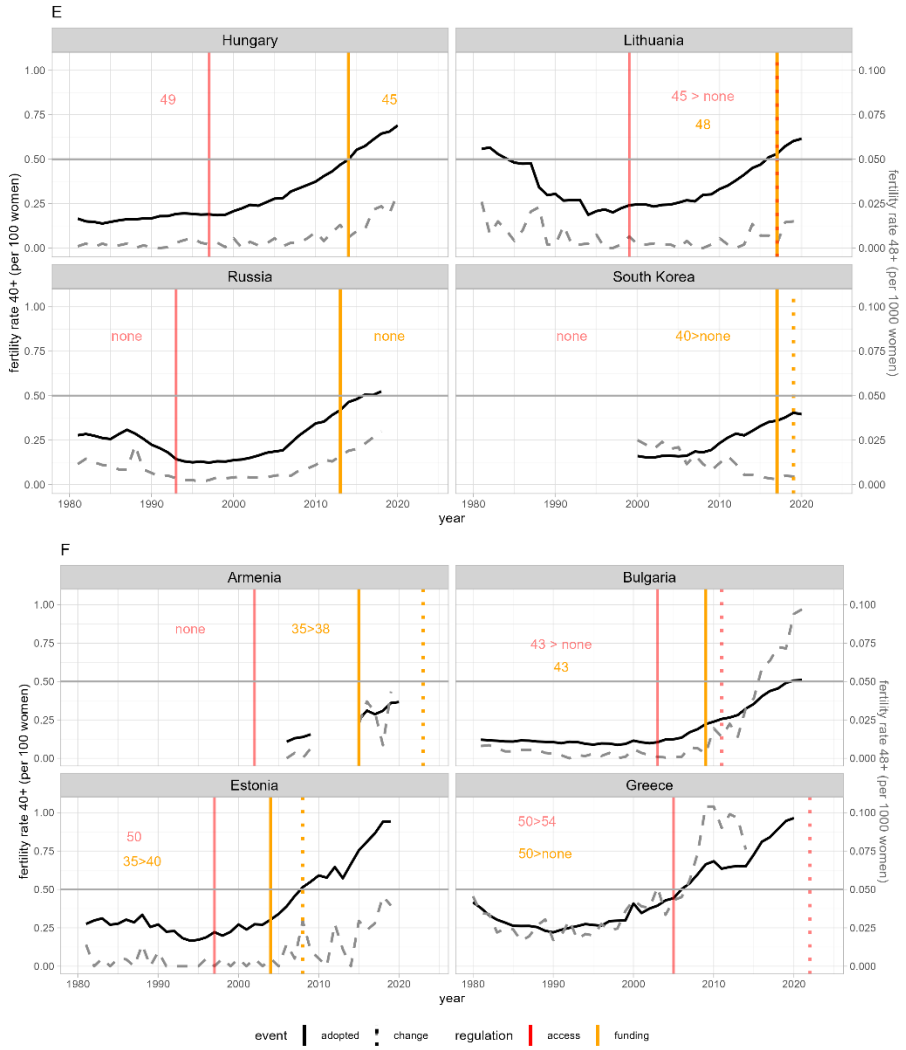
E. Hungary, Russia, Lithuania and South Korea are countries with *permissive age rules despite low fertility levels* when these policies regulating MAR access were adopted (1990s-2000s). Since then, late fertility has been increasing moderately. Reimbursement schemes were implemented a bit later, in the 2010s, with permissive age rules to access public funding despite social age deadlines perceived at younger ages[6], which is explained by pro-natalist goals (Kim 2019; Rusanova 2020; Szalma and Bitó 2021). As suggested by the trends in ASFR48+ in comparison to ASFR40+, the MAR effect on enhancing late fertility trends seems limited.

F. Armenia, Bulgaria, Greece and Estonia have *adapted their MAR policies to upward late fertility trends*. Changes in age rules may have affected or will significantly impact late births, as suggested by the sharp increase in very late fertility in Bulgaria and Greece following permissive regulations.

[4] However, in Norway, age limits for public coverage are formulated in guidelines for practitioners, recommending 42 years old as an age limit.
[5] Average social age deadline for motherhood were close to age 40 in Denmark while higher in Portugal (42 years old) in 2006-07 (Lazzari et al. 2022).
[6] For instance, in Hungary, where the average age deadline for women to conceive was close to 40 in the early 2000s (Lazzari et al. 2022).

Figure 1: Types of countries depending on the timing of MAR age rules and (very) late fertility trends





Discussion

Whether age limits are relevant with regard to late childbearing trends by country is rarely discussed by scholars (Büchler and Parizer 2017; Martani et al. 2022; Piek et al. 2023). This paper shows how MAR policies have preceded or responded differently to changes in fertility behaviours in various contexts. Age rules are sometimes consistent with the prevalence of births at age 40+, either low in some CEE countries (group A) or high in some Scandinavian countries (group B). Age rules for partial or full reimbursement are rather strict (cut-offs of 39-42 years old) despite the increase in late fertility in most countries (groups C and D). Whether these indirect regulations are associated with access age limits depends on what is socially perceived as 'too late' to conceive. Countries in group E are contexts where, despite a low prevalence of late births, pronatalism motivates permissive age limits, regardless of the normative context. This is similarly observed regarding MAR access for single women (Compans and Zagel 2023). In turn, revisions of age rules in response to upward trends in late fertility have been occasional (group F), despite high-income countries adapting their MAR policies to social change for other aspects.

Strong views against permissive age cut-offs to access MAR can be driven by social constructions of the 'proper' normative window for women and by the decreasing treatment

success rates with age[7]. However, over the years, more high-income countries have started regulating and allowing planned oocyte cryopreservation (POC)[8]. Hence, while age rules often resist social change, it may be that countries adapt their MAR policies to postponed parenthood through the regulation of techniques that hold greater promise in offsetting age-related infertility. Further analysis will investigate the quantity and coherence (Neyer and Andersson 2008; Perelli-Harris and Gassen 2012) of MAR policies regulating the most relevant techniques to late childbearing.

References

Abramowitz, J. (2017). Assisted Reproductive Technology and Women's Timing of Marriage and Childbearing. *Journal of Family and Economic Issues*, *38*(1), 100–117. https://doi.org/10.1007/s10834-016-9485-4

Adamson, G. D. (2009). Global Cultural and Socioeconomic Factors That Influence Access to Assisted Reproductive Technologies. *Women's Health*, *5*(4), 351–358. https://doi.org/10.2217/WHE.09.28

Barclay, K., & Myrskylä, M. (2016). Advanced Maternal Age and Offspring Outcomes: Reproductive Aging and Counterbalancing Period Trends: Advanced Maternal Age and Offspring Outcomes. *Population and Development Review*, *42*(1), 69–94. https://doi.org/10.1111/j.1728-4457.2016.00105.x

Beaujouan, É. (2020). Latest-Late Fertility? Decline and Resurgence of Late Parenthood Across the Low-Fertility Countries. *Population and Development Review*, *46*(2), 219–247. https://doi.org/10.1111/padr.12334

Berg Brigham, K., Cadier, B., & Chevreul, K. (2013). The diversity of regulation and public financing of IVF in Europe and its impact on utilization. *Human Reproduction*, *28*(3), 666–675. https://doi.org/10.1093/humrep/des418

Büchler, A., & Parizer, K. (2017). Maternal Age in the Regulation of Reproductive Medicine – A Comparative Study. *International Journal of Law, Policy and the Family*, *31*(3), 269–290.

Calhaz-Jorge, C., De Geyter, C. h, Kupka, M. S., Wyns, C., Mocanu, E., Motrenko, T., et al. (2020). Survey on ART and IUI: legislation, regulation, funding and registries in European countries. *Human Reproduction Open*, *2020*(1), hoz044. https://doi.org/10.1093/hropen/hoz044

Compans, M.-C., & Zagel, H. (2023, September 18). *Is legislation of medically assisted reproduction related to reproductive norms in Europe?* Presented at the ECSR Annual conference 2023, Prague, Czechia.

Devolder, D., & Borisova, E. (2022). Demographic impact of In Vitro Fertilization in Spain. *Medicina Reproductiva y Embriología Clínica*, *9*(2), 100115. https://doi.org/10.1016/j.medre.2022.100115

Engeli, I., & Rothmayr Allison, C. (2016). Governing new reproductive technologies across Western Europe The gender dimension. In M. Lie & N. Lykke (Eds.), *Assisted Reproduction Across Borders: Feminist Perspectives on Normalizations, Disruptions and Transmissions* (1st ed., pp. 87–99). New York, NY: Routledge, 2017. | Series: Routledge: Routledge. https://doi.org/10.4324/9781315561219

Esposito, G., Viganò, P., Filippi, F., Franchi, M., Corrao, G., Parazzini, F., & Somigliana, E. (2023). The modest impact of assisted reproductive technology on the second birth: insights from a population-based study in Lombardy, Northern Italy. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, *288*, 56–60. https://doi.org/10.1016/j.ejogrb.2023.06.027

[7] Whether age rules are motivated by cost-benefit ratio concerns can be seized by age rules to access oocyte donation (Piek et al. 2023). Indeed, success rates with gamete donation from a younger woman are higher than with a woman's own eggs at late ages, and some countries have specific age limits in cases of heterologous fertilization.

[8] For instance, Norway in 2020 and France in 2021.

Goisis, A., Håberg, S. E., Hanevik, H. I., Magnus, M. C., & Kravdal, Ø. (2020). The demographics of assisted reproductive technology births in a Nordic country. *Human Reproduction*, *35*(6), 1441–1450. https://doi.org/10.1093/humrep/deaa055

Kim, S. (2019). Reproductive technologies as population control: how pronatalist policies harm reproductive health in South Korea. *Sexual and reproductive health matters*, *27*(2), 6–12.

Klitzman, R. L. (2016). How old is too old? Challenges faced by clinicians concerning age cutoffs for patients undergoing in vitro fertilization. *Fertility and Sterility*, *106*(1), 216–224. https://doi.org/10.1016/j.fertnstert.2016.03.030

Lazzari, E., Compans, M.-C., & Beaujouan, E. (2022, December 14). Changing childbearing age norms in Europe in times of fertility postponement. SocArXiv. https://doi.org/10.31235/osf.io/xbheq

Lazzari, E., Gray, E., & Chambers, G. (2021). The contribution of assisted reproductive technology to fertility rates and parity transition: An analysis of Australian data. *Demographic Research*, *45*(35), 1081–1096. https://doi.org/10.4054/DemRes.2021.45.35

Löwy, I. (2006). La fabrication du naturel : l'assistance médicale à la procréation dans une perspective comparée. *Tumultes*, *26*(1), 35–55. https://doi.org/10.3917/tumu.026.0035

Martani, A., De Clercq, E., De Geyter, C., Pennings, G., Wangmo, T., & Elger, B. S. (2022). Deconstructing age(s): an analysis of the different conceptions of age as a legal criterion for access to assisted reproductive technologies. *Journal of Law and the Biosciences*, *9*(2), lsac036. https://doi.org/10.1093/jlb/lsac036

Mintziori, G., Lambrinoudaki, I., Kolibianakis, E. M., Ceausu, I., Depypere, H., Tamer Erel, C., et al. (2013). EMAS position statement: Late parenthood. *Maturitas*, *76*(2), 200–204. https://doi.org/10.1016/j.maturitas.2013.07.008

Neyer, G., & Andersson, G. (2008). Consequences of Family Policies on Childbearing Behavior: Effects or Artifacts? *Population and Development Review*, *34*(4), 699–724. https://doi.org/10.1111/j.1728-4457.2008.00246.x

Perelli-Harris, B., & Gassen, N. S. (2012). How Similar Are Cohabitation and Marriage? Legal Approaches to Cohabitation across Western Europe. *Population and Development Review*, *38*(3), 435–467. https://doi.org/10.1111/j.1728-4457.2012.00511.x

Piek, S. R., Pennings, G., & Provoost, V. (2023). Age-based restrictions on reproductive care: discerning the arbitrary from the necessary. *Theoretical Medicine and Bioethics*. https://doi.org/10.1007/s11017-023-09648-w

Präg, P., Mills, M., Tanturri, M. L., Monden, C., & Pison, G. (2017, July). *The Demographic Consequences of Assisted Reproductive Technologies*. https://doi.org/10.31235/osf.io/su49v

Rusanova, N. E. (2020). Assisted reproductive technologies in Russia: medical breakthroughs and social problems. *Population and Economics*, *4*(4), 5–18. https://doi.org/10.3897/popecon.4.e58271

Singer, A. (2022). From safeguarding the best interest of the child to equal treatment: Legislating assisted reproductive techniques in Sweden. In E. Griessler, L. Slepičková, H. Weyers, & N. Zeegers (Eds.), *The Regulation of Assisted Reproductive Technologies in Europe. Variation, Convergence and Trends* (pp. 160–186). Routledge, Taylor & Francis Group.

Sobotka, T. (2013, January 2). *Oocyte cryopreservation: a socio-demographic viewpoint*. Presented at the 1st International Symposium on Social Egg Freezing, Barcelona.

Szalma, I., & Bitó, T. (2021). Knowledge and attitudes about assisted reproductive technology: Findings from a Hungarian online survey. *Reproductive BioMedicine and Society Online*, *13*, 75–84. https://doi.org/10.1016/j.rbms.2021.06.005