

## **Medically assisted reproduction and non-normative family forms: legislation and public opinion in Europe**

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## Abstract

This paper explores the relationship between access legislation of Medically Assisted Reproduction (MAR) and public attitudes towards family structures in Europe. It contributes to understanding the contextual frameworks that may facilitate the formation of a family outside the different-sex couple norm. The permissiveness of MAR policies has received political attention due to its potential to revolutionize family formation, with varying regulatory routes among states regarding access for single individuals and same-sex couples. We particularly examine regulatory trends in granting MAR access to single women and lesbian couples in Europe, and how legislation aligns with attitudes towards single motherhood and same-sex parenthood. Utilizing descriptive analysis and two-level models on original MAR legislation data across 36 European countries and the European Values Study (2008–10 and 2017–20) for attitudes, we show that MAR access is granted to lesbian couples in contexts where same-sex parenthood is accepted. By contrast, legalized MAR access for single women seems rather disconnected from public opinion towards single motherhood. As a whole, the paper delineates contexts in which the combination of social acceptance and legal permissibility of MAR use for non-normative prospective parents may favor the formation of ‘new’ family forms.

Keywords: medically assisted reproduction, MAR policies, same-sex parenthood, single motherhood, Europe

## Introduction

After its inception in the 1980s, Medically Assisted Reproduction (MAR), notably in-vitro fertilization (IVF) and related techniques<sup>1</sup>, has rapidly developed. Since then, the world has witnessed over 12 million IVF births (ESHRE news, 2023). States also regulate these medical practices but started to do so at different paces and scopes. In Europe, some countries still have no or little MAR regulation, whereas others have implemented explicit laws, exhibiting different degrees of permissiveness and following diverse reform trajectories (Präg and Mills, 2017; Griessler, 2022). Such legislation governs which MAR technology can be used for procreation and for whom this is a legal option. Common criteria for access rules, which define who is deemed eligible to reproduce, include marital or partnership status and sexual orientation (Calhaz-Jorge et al. 2020). Notably, granting single women and lesbian couples access to sperm or embryo donation allows family formation.

Such diversification of family forms arguably conflicts with dominant family norms, including the perception that procreation should occur within a different-sex stable couple in most societies. Indeed, single mothers are often perceived as deficient in comparison to two-parent families in public opinion (Quadlin *et al.*, 2022), and the political debates around single motherhood have mostly revolved around their low economic resources (Gornick, Maldonado and Sheely, 2022) – a stigma built around lower-class imagery (Rowlingson and Mckay, 2002). However, we know little about public attitudes towards single mothers with regard to access to MAR. It could be that, when single women who seek medical help to conceive have significant economic resources, such as in high-income countries (Weissenberg, Landau and Madgar, 2007; Salomon *et al.*, 2015; Volgsten and Schmidt, 2021), single motherhood may be more publicly acceptable. Attitudes towards same-sex parenthood through MAR have also not been studied in comparative perspective. However, research on the legal provision of same-sex marriage in Europe suggests that attitudes

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1. Medically assisted reproduction encompasses all medical interventions for fertility impairments. It includes a large range of techniques such as ovulation induction, ovarian stimulation, in vitro fertilization (IVF) or intra-uterine insemination (IUI) with and without gamete donation (Zegers-Hochschild *et al.*, 2017). In this paper, MAR mainly refer to IVF and IUI with sperm donation.

towards homosexuals are more positive where laws are more inclusive (Hooghe and Meeusen, 2013; Kenny and Patel, 2017; Abou-Chadi and Finnigan, 2019; Aksoy *et al.*, 2020; Digoix, 2020; Waaldijk, 2020).

Whether this also applies to the regulation of MAR remains to be determined. So far, not least the lack of harmonized data has been a challenge to investigate this topic.

In this explorative study, we address these issues in three steps. First, we describe to which extent legislation in European countries has moved towards more permissiveness regarding which ‘categories of women’ can access MAR, using original data on laws regulating MAR access in 36 countries. Second, we draw on survey data from the European Values Study (EVS, 2008–10 and 2017–20) to descriptively investigate the association between MAR legislation and attitudes towards two types of parents that deviate from the norm of procreation within different-sex couples: same-sex parents and single mothers. Third, we test whether the association between public opinion and MAR laws identified in the previous step holds in two-level regression models, in which we control for countries’ population composition.

## **Background and research questions**

### ***The potential of Medically Assisted Reproduction to diversify family forms***

In IVF treatment, oocytes are retrieved from a woman’s body and put in contact with previously collected sperm. The resulting embryos are then either implanted back into the uterus or frozen for potential future transfer. Together with intrauterine insemination (IUI) of pre-collected sperm, these MAR technologies can have a direct bearing on the array of kinship and family forms (McKinnon, 2015), as they can involve different bodily material than in procreation initiated by sexual intercourse. Through sperm or embryo donation, women without a male partner can become pregnant. Through surrogacy – an arrangement by which a woman carries a pregnancy and gives birth for another person or couple aspiring to parenthood, men without a female partner can also access fatherhood.

There may be a growing demand for MAR procedures from single individuals.<sup>2</sup> As births are increasingly delayed (Leridon and Shapiro, 2017), more and more women may find themselves single at older ages and seek sperm donation to try to have a child before it is ‘too late’. The same increase in demand may apply to same-sex couples, as sexual minorities’ rights regarding family life have undergone profound changes in the last decades. Among the available options to become parents for singles and same-sex couples, adoption has emerged as an option in some countries (Takács, Szalma and Bartus, 2016), albeit with considerable administrative barriers (Adler and Lenz, 2023). In addition, MAR tends to be preferred because prospective parents generally want to have a biological connection with their offspring – at least with one parent (Goldberg and Scheib, 2015; Bell, 2019).

### ***Regulating Medically Assisted Reproduction***

Whether non-normative prospective parents have access to MAR highly depends on legislation. Laws are an important factor in homogenizing MAR availability across a national territory. In contexts of scarce or no legislation, guidelines for medical practitioners can possibly serve as rules but are not obliging (Calhaz-Jorge et al. 2020), and differences in fertility clinics’ practices may drive disparities in the availability of fertility care.

The regulation of MAR has taken various forms and evolved at different paces and patterns across Europe. In addition to being a pioneer in the development of the techniques, the UK has regulated medical practice from the start. Some European countries followed this lead closely, while others implemented regulations much later (Griessler, 2022).

The legislation defines which techniques are allowed and who their recipients are. There is also a distinction between direct legislation that regulates who can access MAR and indirect rules that define conditions to access reimbursement of costs for interventions in countries with partial or full public coverage

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2. Representative statistics at the country level on the characteristics of MAR patients based on their partnership status and sexual orientation are rare. For instance, it has been estimated that, among a cohort of childless women born in the 1970s seeking fertility care in Finland, 11% were single (Pelikh *et al.*, 2023).

(Engeli and Rothmayr Allison, 2016). This paper focuses on legislation defining who can access MAR interventions.

For such direct legislation, most European countries started with restrictive laws from the 1990s and 2000s, only allowing access to different-sex married couples (Präg and Mills, 2017). These rules reflected the prevailing reproductive norm that procreation should be limited to this ‘traditional’ setting, which has been referred to as repronormativity (Weissman, 2017). Over time, regulations have considerably changed, although at different paces across places, and some scholars expect MAR policies to converge to some extent (Weyers, 2022). Legal convergence has been observed regarding the marriage criterion which, today, remains a standard requirement for accessing MAR only in a handful of European countries (Calhaz-Jorge *et al.*, 2020). In contrast, there is more variation regarding whether lesbian women and single women may receive MAR interventions, although legislation has generally become more inclusive across the continent (Präg and Mills, 2017). Since a thorough description of the timing and extent of the regulatory process of MAR in Europe is lacking, in the first step of our investigation we ask: When and to what extent have European regulations become more permissive in granting access to MAR for lesbian couples and single women? We exclude single and gay men from this investigation because the legalization of surrogacy is still scarce and often restrictive (Kuchynska, Kashyntseva and Shchyhol, 2020).

### ***Public opinion and MAR legislation: a consistent link regarding ‘new’ family forms?***

Changes in state regulations are strongly related to social norms, which are reflected in aggregate measures of public attitudes. The causal relationship between norms and regulations goes both ways. On the one hand, attitudes affect policy-making (Burstein, 2003) as regulations may be changed because of society’s demand and because policymakers are concerned about the popularity of their decisions (Kurzer, 2001). On the other hand, once in place, regulations can shape attitudes in the population (Béland, Campbell and Weaver, 2022), in part because they legitimize specific behaviors (Pierson, 1993, 2000; Kurzer, 2001). Consequently, attitudes and regulations are often in accordance, meaning that regulations can mirror what is generally accepted and vice versa.

Against this background, it is likely that MAR policies have evolved parallel with family life and reproduction norms. A cultural change towards more secularized values and autonomous decisions since the 1970s has been documented in different research fields, such as demography (Van de Kaa, 1987; Lesthaeghe, 2014) and sociology (Inglehart, 2006). This shift has been accompanied by changes in policy and legislation, for example, the easing of divorce procedures (González and Viitanen, 2009), the liberalization of abortion law (Fiala *et al.*, 2022), and the expansion of work-family policies (Daly and Ferragina, 2018).

Empirical research also shows clear links between regulation and social norms regarding family and reproduction. For instance, there is evidence of work-family policies feedback on more egalitarian values in European countries (Lomazzi, Israel and Crespi, 2018; Zoch and Schober, 2018). Similarly, the legal provision of same-sex marriage is linked to public opinion towards homosexuality (Takács and Szalma, 2011; Fernández and Lutter, 2013; Hooghe and Meeusen, 2013; Kenny and Patel, 2017; Abou-Chadi and Finnigan, 2019; Aksoy *et al.*, 2020; Digoix, 2020; Waaldijk, 2020). This literature shows, for instance, that legalizing same-sex marriage positively affects the acceptance of gays and lesbians (Takács and Szalma, 2011) and same-sex marriage (Aksoy *et al.*, 2020) in Europe. However, the decreasing stigmatization of homosexuality does not always come with a parallel rise in the acceptance towards same-sex couples as parents, as social norms towards who can form a family appear to be stricter than towards who can form a partnership (Weissman, 2017).

That being said, current knowledge on the link between MAR regulations allowing the formation of same-sex families and their public acceptance is still limited. One reason is the lack of harmonized data across countries.<sup>3</sup> The link between public opinion towards single motherhood and MAR access for single

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3. For same-sex parenthood, there is one work showing a strong association between the legal provision of adoption for same-sex couples and attitudes towards this regulation using data from the European Values Study (EVS) from 2008–10 (Takács *et al.* 2016). Apart from that study, attitudes towards procreation through MAR for same-sex or single women have mainly been studied with qualitative frameworks or among non-representative populations (like patients in fertility clinics or students), with single-country surveys and sometimes only

women is of additional interest. Generally a family form with high economic risk (Gornick, Maldonado and Sheely, 2022), single motherhood may now increasingly include single mothers ‘by choice’ with enough resources to undergo MAR procedures alone (Weissenberg, Landau and Madgar, 2007; Salomon *et al.*, 2015; Volgsten and Schmidt, 2021). However, how accepted non-normative mothers are among the public and how attitudes align with which women are entitled to MAR access is little understood. Hence, our second research question asks: Is regulating access to MAR for same-sex female couples and single mothers consistent with public opinion towards these groups? To answer this question, we look at whether attitudes are favorable towards them in countries with permissible access to MAR based on sexual orientation or partnership status and, conversely, whether countries with restrictive access policies show low levels of acceptance for non-heterosexual parents.

It is important to study these links to better understand the contextual conditions of forming a family outside the different-sex couple norm, as well as to gauge the political implications of reforming MAR legislation. Inconsistency between legal frameworks and public opinions towards non-normative parents may act as a barrier for aspiring parents to seek MAR procedures.

Considering the links between regulations and attitudes discussed above, we expect that permissive MAR regulations towards single and lesbian women are respectively associated with positive attitudes towards these groups being mothers. We also explore possible differences in the link between MAR regulations and acceptance of single and lesbian motherhood in order to tease out different facets of reproductive norms. Existing evidence for the US shows that single mothers are better accepted than same-sex parents (Cheng, Kelley and Powell, 2022); or for Bulgaria, that access to sperm donation is perceived more positively for single women than for lesbian couples (Krastev and Mitev, 2013). In addition, while single women are often associated with a lack of sufficient financial resources and time to care for a child, same-sex couples tend to be stigmatized from a moral viewpoint (Quadlin *et al.*, 2022). This could mean

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regarding access to specific techniques (e.g., Heikkilä *et al.* 2006; Krastev and Mitev 2013; Wennberg *et al.* 2016).



that, for regulatory frameworks to be more permissive, the level of acceptance of same-sex parenthood needs to be higher than what is necessary for single motherhood.

## Materials and Methods

### *Data*

To address our first research question, we need extensive information on MAR regulations for European countries over time. Several publications provide information on access legislation at specific points in time (Berg Brigham, Cadier and Chevreur, 2013; Präg and Mills, 2017; Calhaz-Jorge *et al.*, 2020) but they lack information on the timing of legislation. We collected data on the years when legal access for single women was allowed and when lesbian couples were granted legal access to the techniques (either through intrauterine insemination or IVF) in 36 European countries (Table 1). We retrieved these data from Rainbow Europe<sup>4</sup>, the International Reproduction Policy Database<sup>5</sup> and country-specific sources (listed in Table S1 in the supplementary material). All these sources were cross-checked with each other and with existing references (Präg and Mills, 2017; Calhaz-Jorge *et al.*, 2020). In cases of contradictory information from sources, we relied on the International Reproduction Policy Database and Rainbow Europe, which have the most up-to-date information. We consider MAR regulations to be more permissive when they allow access to a wide range of groups, i.e., in addition to women in different-sex couples, to single women, to lesbian couples or both. MAR regulations are the most restrictive when access is limited exclusively to different-sex couples.

A few aspects of our approach to policy measurement should be clarified. First, some countries do not have specific MAR legislation, but access can be regulated through laws ruling health or family aspects (e.g., Ukraine). Romania and Ireland have no legislation on access for single and lesbian women. Second, access to MAR for women who do not have a male partner mainly refers to access to sperm donation. Most

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4. <https://rainbow-europe.org>

5. <https://irpd.wzb.eu/>

European contexts only grant MAR access to these women if they use their own oocytes, as double gamete donation or embryo donation is often forbidden (Calhaz-Jorge *et al.*, 2020). Third, note that in some countries, newly introduced laws validated years of medical practice, while in others, the enactment of restrictive legislation may have gone against inclusive practices of single women and lesbian couples on the ground. We do not account for possible differences between practices and laws in the analysis, but rely on the uniformization power of legislation over national territory.

[TABLE 1 ABOUT HERE]

For the second part of the paper, we use data from the European Values Study (EVS), a cross-sectional survey on values and attitudes conducted on representative samples of the adult population of some European countries. So far, this study has been repeated five times between 1981 to 2020. The number of countries surveyed each year varies (between 16 and 47). In addition to a core questionnaire, some questions were added or removed from one wave to another.

We use a question on the approval of single motherhood, which inquired opinions regarding becoming a mother as being single ('If a woman wants to have a child as a single parent, but she does not want to have a stable relationship with a man, do you approve or disapprove?'). The possible responses include 'approve', 'disapprove', 'depends', and 'don't know'. Since we compare public opinion towards single motherhood to the legislation regarding single women, which started in the 1990s, we focus on EVS-2 (1989–93), 3 (1999–2001) and 4 (2008–10).

New questions were added to the latest EVS data (4 and 5), while the one on single motherhood was removed from EVS-5. EVS-4 (2008–10) included an indicator for the acceptance of same-sex parenthood through adoption, asking whether people agree with the statement: 'Homosexual couples should be able to adopt children'. In EVS-5 (2017–20), the measure is broader as people give their opinion about: 'Homosexual couples are as good parents as other couples'. For both questions, possible answers ranged from strongly disagree to strongly agree on a 5-point Likert scale, with the possibility for nonresponse

(‘don’t know’). We recoded 5 as strong agreement and 1 as low agreement with these statements. We examine the association between attitudes towards same-sex parents and the legislation regulating MAR access for lesbian couples only, and the legal access for all women in general.

The previously described indicators do not specifically survey opinions towards becoming a parent through assisted reproduction. For this reason, our investigations of perceptions towards single motherhood and same-sex parenthood also examine whether these opinions are correlated with the acceptance of MAR (in bivariate scatter plots in the descriptive analyses and by controlling for MAR attitudes in multivariate models). In EVS-4 and 5, a question asked, on a continuous scale: ‘Whether you think [artificial insemination or in-vitro fertilization] can always be justified (10), never be justified (1), or something in between’. Respondents could also state that they did not have an opinion about MAR (‘don’t know’).

## ***Method***

For our first research question, we describe the introduction of MAR regulations between 1993 and 2022 in terms of their permissiveness. We also map the sequencing of legislation across European countries, distinguishing whether access to MAR was extended a) to single women and lesbian couples at the same time, b) to single women only, c) first to lesbian couples and then to single women, d) to lesbian couples only, e) neither to single women nor to lesbian couples.

Our second research question on the link between public opinion and legislation is examined descriptively at the macro level, considering public opinion as an aggregate of individual attitudes among people aged 18 to 59 born in the countries in which they were surveyed.<sup>6</sup> We consider positive social norms towards single motherhood as the share of respondents approving of single women becoming mothers (vs.

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6. The age restriction is partly motivated by the fact that there are a few respondents of older ages in some countries. Given that, with age, attitudes towards same-sex couples, single women or MAR tend to be more negative (Takács and Szalma, 2011; Szalma and Djundeva, 2020), this could induce a downward bias in the aggregates. We also restrict the sample to people born in each studied country to better capture the normative context where they presumably grew up.

people disapproving or no strong opinions, see detailed distributions in Table A1). Because indicators for the acceptance of same-sex parents and assisted reproduction were measured on a continuous scale, we looked at average opinions by country. Aggregates are calculated using survey individual weights. Additionally, some respondents do not have a solid opinion on the topics under consideration ('don't know' responses). To account for that, average values at the country level are adjusted by the share of acknowledgement of an opinion. Those vary between 75% and 100% depending on the survey year and attitudinal indicator.<sup>7</sup>

Our research questions focus on macro-level aspects (legislation and public opinion) and address them descriptively. However, differences in public opinion between countries at the aggregate level may be explained by differences in the composition of the populations, and the link between attitudes and legislation may not hold once controlled for individuals' characteristics. For instance, non-normative families may be better accepted in countries with higher levels of educational attainment, because tertiary educated individuals are more likely to approve of non-normative families. Hence, we estimate attitudes towards non-normative types of parents using two-level mixed-effect regression models, which account for the fact that individuals are nested within specific countries. Separate models for each measure of attitudes as dependent variables and survey year assess the association with contextual factors while controlling for respondents' characteristics. These models were implemented using the lme4 package in R.

The paper displays the results obtained from linear regressions for the attitudes towards same-sex parents. These models rely on different acceptance indicators between EVS-4 and 5 (regarding adoption or parenting). Since our focus is on laws permitting same-sex couples to become parents through assisted reproduction, we only show results on attitudes towards same-sex parents in 2017–20 in the main text (results for 2008–10 are in the appendix). Previous work has shown that perceptions of homosexuality are

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7. High levels of non-acknowledgement may, for instance, reflect that MAR technologies were not commonly known and used in some European contexts. For example, in 2008, the average acceptance of MAR in Albania was 4.1, with 86% of the respondents acknowledging an opinion. Our weighted measure of the average MAR acceptance score is then  $4.4 * 0.90 = 4.0$  (see Table A2 with non-adjusted aggregate values and shares of acknowledgement).

associated with socio-demographic characteristics (Takács and Szalma 2011). Therefore, we adjust the models for respondents' age (10-year age groups), sex, level of education (ISCED in three groups), employment status at the time of the survey (full-time, part-time, self-employed, unemployed, in education or other), partnership status (single, cohabiting or married), parental status (childless or parents), country of birth (surveyed country or not) and the frequency of religious service attendance (considered as continuous, from 8 – more than once a week, to 1 – practically never).<sup>8</sup> There is no information on whether respondents are in a same-sex relationship or had a child while not being in a partnership. However, we control for a continuous variable indicating the degree of individual acceptance of homosexuality (from 1 to 10). Previous work using the European Social Survey showed that attitudes towards homosexuality are associated with the level of satisfaction in democracy and with whether political views are left or right-wing (Takács and Szalma 2011). For these reasons, we also control for similar variables in EVS: the respondents' level of confidence in political parties (a great deal, quite a lot, not very much, not at all) and a scale indicating individuals' political views (1 to 5 indicating being more left-wing and 6 to 10 being more right-wing. Because many respondents declared no clear position, we keep the 'don't know' response as a distinct category in the models). All covariates are fixed, except for the respondents' political views which can vary from one country to another. This model specification with one random effect is motivated methodologically (Heisig and Schaeffer, 2019) and to account for various political systems and contexts between European countries. In turn, models for 2017–20 are run on 40,453 individuals from 31 countries, which is a reasonable number to obtain reliable results in mixed-effect multilevel models (Bryan and Jenkins, 2016). The description of each covariate and the sample sizes by country are displayed in Table A3.<sup>9</sup>

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8. We also tested a control indicating whether respondents belonged to a religious denomination and which one. Due to its lack of significance and for model parsimony, we excluded this variable from our model specifications.
9. Note that models for 2008–10 are run without a control for the parental status (missing for EVS-4 in the joint dataset). Models for the acceptance of single motherhood in 2008–10 were similarly run. We also tested models that estimate the approval of single motherhood vs. disapproving or having no strong opinion, and models that excluded respondents who did not acknowledge an opinion. Both yielded similar results.

At the country level, models control for MAR legislation and the average acceptance of assisted reproduction.<sup>10</sup> As attitudes towards same-sex parents are measured on an ordinal scale, we also compared linear regressions with ordinal logit models. Because the results were similar, we only show linear models.

## Results

### *Towards more permissive MAR legislation in Europe*

As a general trend, European countries have moved towards more permissive MAR legislation (Figure 1). Since the 1990s, the number of countries which only allowed different-sex couples to access MAR has declined, most notably in the late 2000s-early 2010s. In 2022, 13 European countries had permissive MAR policies, granting access to all women regardless of their sexual orientation or partnership status (Figure 1a). Decomposing the sequence of this shift shows that more permissiveness in Europe was achieved after some Western countries granted MAR access to single women and lesbian couples simultaneously, while some Nordic countries extended access to lesbian couples before granting it to single women (Figure 1b). In Austria and Switzerland, only different-sex and lesbian couples are legally entitled to seek medical help to conceive. Conversely, Central, Eastern and some Southern European countries restrain MAR access to different-sex couples or have only extended it to single women.

[FIGURE 1 ABOUT HERE]

### *Non-alignment of public opinion towards single motherhood and the legal access to MAR for single women*

As a second step, we address whether this shift towards more permissive MAR policies in Europe was associated with changes in acceptance of non-normative parents. We observe that, in 2008 (Figure 2),

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10. We tested for additional controls for other relevant cultural factors (the main religious denomination and the Human Development Index). These variables did not yield significant results when added along with MAR legislation. Therefore, they are not included in the final models.

several countries where both single motherhood and assisted reproduction were widely accepted did not permit single women to access MAR (e.g., Iceland, France, Slovenia). Conversely, some countries with low levels of approval for single motherhood had already granted this access to women without a partner (Armenia and Finland). Accordingly, logistic multilevel models estimating the acceptance of single motherhood (vs. no acceptance or no opinion) show no significant association with MAR legislation in 2008, neither with nor without controls for countries' population composition (results available upon request).

This weak relationship at one point in time also holds from a longitudinal perspective. This is shown in Figure A1, although without joint information on the acceptance of assisted reproduction. Over time, the approval of single mothers has increased from the 1990s to the 2000s in most European countries. However, when comparing this trend to the timing of the legislation of MAR access for single women, no clear pattern emerges.<sup>11</sup>

[FIGURE 2 ABOUT HERE]

### *Perceptions of same-sex parents are strongly associated with MAR access for lesbian couples*

Contrary to what we find for single motherhood, public opinion towards same-sex parents is highly consistent with legislation regulating whether lesbian couples have access to assisted reproduction. In the late 2000s or late 2010s, countries with high levels of acceptance of same-sex parenthood and assisted

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11. For instance, Malta granted access to sperm donation for single women before France did, despite much lower general approval of single motherhood. In Finland, this legal change followed a decrease in approval over time. In Czechia, single women still cannot use assisted reproduction, despite an upward trend in the approval of single motherhood similar to other countries where it was eventually allowed, like Sweden. Iceland is another illustrative example of this non-alignment, as access to MAR was only extended to single women in 2010 despite high levels of approval since the 1990s (Figure A1).

reproduction granted access to sperm donation to lesbian couples (Figure 3). Further, over the years, more countries have extended access to MAR, which seems in line with a cultural change towards greater acceptance of assisted reproduction (more countries shifted to the right-hand side of the graphs between Figure 3a and 3b) and same-sex parenthood (more countries to the top) – keeping in mind the limited comparability of the indicators for the latter. Note that France and Switzerland, at the top-right panel of Figure 3b, extended MAR access to lesbian couples shortly after the observation window (in 2021 and 2022, respectively).

[FIGURE 3 ABOUT HERE]

In addition to the alignment of attitudes towards same-sex parents with access rules for lesbian couples, looking at the regulation for lesbian couples *and* single women adds to the picture. We show this through the estimated association between MAR regulation and attitudes towards same-sex parents with multilevel linear regressions in the late 2010s (Table 2). Based on a null model without any controls (model M0), 33 % of the variation in attitudes towards same-sex parents is explained by country-level factors.<sup>12</sup> MAR access legislation and public opinion towards MAR explain a great deal of this country-level variation, as the country level's variance partition coefficient (VPC) decreases to 8% in model M1. Mirroring the macro-level description, acceptance of same-sex couples being parents is higher in countries where public opinion is generally favorable to the use of assisted reproduction. In line with expectations, compared to countries with the most permissive legislation, attitudes towards same-sex parents are more negative in countries where only different-sex couples have access to MAR. More interestingly, attitudes are the most negative in countries where single women are legally included as recipients of MAR interventions and in countries with no specific legislation (M1).

Part of this cross-context variation is explained by countries' composition, as the country-level component accounts for 6% of the total variance in model M2. In this model controlling for countries'

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12.  $0.74 * 100 / (0.74 + 1.47)$ .



individual characteristics, the association with countries with no legislation becomes non-significant. We also observe similar negative associations between attitudes and legislation in countries where MAR access has been extended to single women only ( $\beta=-0.381$ ,  $p=0.023$ ) and in contexts where assisted reproduction is granted solely to different-sex couples ( $\beta=-0.395$ ,  $p=0.009$ ).<sup>13</sup> This means that, net of population composition<sup>14</sup>, contexts where acceptance of same-sex parents is lowest are those where assisted reproduction has not moved towards more permissiveness, or only for single women but not lesbian couples. This supports the idea that the low acceptance of same-sex parents within a country may be a barrier for lesbian couples to obtain legal access to assisted reproduction, even in countries where MAR legislation deviates from repronormativity for single women.

[TABLE 2 ABOUT HERE]

## Conclusion and discussion

Since the 1980s, the European legal landscape regarding MAR regulations has considerably evolved, moving towards more permissive access rules in most countries. At the dawn of the 2020s, several European contexts allow all women, regardless of their partnership status and sexual orientation, to seek fertility care. This extended access to different groups has sometimes been granted gradually. As of today, some countries allow MAR access only to single women or only to lesbian couples.

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13. These findings are similar in models estimating the link between attitudes towards same-sex parents through adoption and MAR legislation in 2008–10 ( $\beta=-0.386$ ,  $p=0.019$  for countries with extended MAR access for single women and  $\beta=-0.397$ ,  $p=0.008$  for countries with restrictive MAR access, Table A4).

14. At the individual level, attitudes towards same-sex parents are more positive among women than men, childless people compared to parents, cohabiting people compared to both married and singles and people born in the country where they were surveyed (Table 2). People with positive views towards homosexuality in general also tend to be favourable to same-sex couples as parents. Attitudes are also increasingly positive with higher levels of confidence in political parties, and are more negative with the degree of attendance of religious services and with age from the 40–49 age group.

Based on an original collection of data on the year of adoption of MAR laws and on opinion survey data in several European countries, our analysis shows a strong link between attitudes towards same-sex parents and access to sperm donation for lesbian couples. According to Nußberger and Van de Graaf (2023), contemporary Europe witnesses the persistence of an ideological divide between the ‘East’ and the ‘West’ regarding sexual minorities’ reproductive rights. This is also supported by our analysis, which suggests that, despite a general shift towards more permissive laws, negative perceptions of same-sex parents may explain the exclusion of lesbian couples from MAR access in some contexts and the limited cross-country convergence in regulations.

Our finding that MAR access for single women is weakly linked with public opinion towards single motherhood warrants some discussion. One possible way of explaining the difference in the link between attitudes towards same-sex and single women and MAR regulations is that same-sex couples’ family formation may be evaluated more based on deep-seated moral values than single motherhood (Quadlin *et al.*, 2022). By contrast, attitudes towards single mothers relate more to behavioral expectations towards parents, with particular relevance to social class. Indeed, growth in single motherhood has been shown to be pronounced among people with low socio-economic status (McLanahan, 2004), and a primary concern has revolved around possible detrimental outcomes for children and the intergenerational transmission of disadvantage (Härkönen, Bernardi and Boertien, 2017). Related to that, limitations in our study design may also explain the disconnection between laws and public opinion towards single motherhood that we find. Indeed, the attitudinal indicator we employ does not specifically ask about becoming a single mother *through assisted reproduction*. In line with the previous considerations, depending on the context, single women may be more associated with separations (Koops, Liefbroer and Gauthier, 2021) and with the image of mothers facing economic insecurity rather than those who possess sufficient resources to undergo MAR procedures. Parenthood under precarious economic conditions often carries social stigma, possibly leading to inconsistent interpretation of this indicator across countries. Therefore, it may also fail to accurately capture the social approval of having children while not being in a partnership, as it would tend to reflect the

economic conditions under which becoming a mother is accepted.

Interpretation is further constrained by other measurement issues. First, the attitudinal indicator about same-sex parents focuses on adoption in 2008, while in 2017, questions are asked about same-sex couples being parents, regardless of how they have children. Second, we relate this attitudinal indicator to the regulation of MAR access for lesbian couples – although the question on attitudes is gender-neutral. In turn, this paper highlights the need for harmonized data on the acceptance of these emerging family types across countries.

Despite these limitations, there is some indication that permissive MAR regulation for single women may be related to other factors than public opinion towards single mothers, warranting further research. To mention one, we argue that concerns regarding low fertility levels may drive permissive legislation for single women in political attempts to enhance fertility levels (Ziebe and Devroey, 2008). In 2008, assisted reproductive technologies were well perceived (Figure 2) in countries where single women could access MAR despite low or moderate acceptance of single motherhood. Some of these countries (such as Russia or Hungary) also recently promoted access to assisted reproduction as a policy tool to boost fertility by increasing public coverage of the treatments (Rusanova, 2020; Szekulesz, 2022). Thus, extending access to single women may be politically motivated by low-fertility concerns.

Our analyses further suggest that the general move towards more permissiveness in the regulation of MAR access has gone hand in hand with a cultural change towards greater acceptance of assisted reproduction and diverse family forms. One reservation is that, due to limitations in attitudinal data, we do not explore to what extent differences in opinions across time and place explain legislation or whether policies influence public perception. Because of evidence of causal directions both from opinions to legislation (Burstein, 2003) and from laws to attitudes (Pierson, 1993; Aksoy *et al.*, 2020), we instead assume that this link is both ways. Further research could better test this link, if questions on attitudes towards ‘new’ types of parents and assisted reproduction continue to be asked regularly in surveys.

Despite these open questions, our analyses can inform future research avenues. In addition to changes in

normative frameworks, MAR regulations are likely to continue to evolve. MAR development is an ongoing process and countries will have to keep revising their laws accordingly. Convergence in access rules may also develop in the longer run, although the pace at which this may occur is hardly predictable (Weyers, 2022). Further regulatory and normative changes to monitor notably include access for same-sex male couples. Currently, it is possible for them to use surrogacy arrangements for starting a family in a few countries in Europe (such as the UK and the Netherlands) and globally (US, Canada or Australia), sometimes because of a lack of regulation of this technique (like in Albania or Cyprus). With increasing acceptance of same-sex parents in some countries, legalization of surrogacy may eventually spread, and include gay men as possible MAR recipients. As for now, legal and social resistance to surrogacy is still strong in many countries (Heikkilä *et al.*, 2006; Stöbel-Richter *et al.*, 2009; Krastev and Mitev, 2013; Wennberg *et al.*, 2016; Greil *et al.*, 2017).

Finally, this study contributes to understanding how legislative frameworks and societal attitudes intertwine in shaping the landscape in which people are likely to use MAR to form non-normative families. Positive attitudes and a permissive regulatory context may favor diverse family forms. However, although access regulations are a crucial feature, the availability of MAR interventions can also be impeded by barriers related to medical practice and the acceptance of non-normative families within the medical community or society at large. We showed that, in 2008 in some European countries, MAR was available for single women while becoming a mother without having a partner was not widely accepted. In these contexts, social rather than legal features may have been barriers for single women to access MAR interventions, as reported for some contexts such as Russia (Svitnev, 2010) or more recently France (Rozée and Malmanche, 2023). Indirect regulations are also of importance. Relevant to women who are not in a different-sex relationship, some European countries do not reimburse MAR use with gamete – hence sperm – donation, and with a limit based on the women's age (Calhaz-Jorge *et al.*, 2020). Our analyses provide insights into whether normative changes align with direct regulation of MAR availability for non-normative prospective mothers, but may fall short in assessing the actual access to MAR interventions. Looking

forward, there is much scope to study the uptake of assisted reproduction and the diversity of family types against various legal and normative backdrops.

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## Data availability statement

The data underlying this article are available in its online supplementary material for MAR legislation, and access to the European Values Study is free of charge (see information at: <https://europeanvaluesstudy.eu/>). A replication package can be found under DOI: 10.5281/zenodo.10875176.

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**Table 1: Years when laws ruling access to MAR were voted by country**

| Country                   | Access for single women | Access for lesbian couples |
|---------------------------|-------------------------|----------------------------|
| Albania                   | Not allowed             | Not allowed                |
| Armenia                   | 2004                    | Not allowed                |
| Austria                   | Not allowed             | 2015                       |
| Belgium                   | 1999                    | 2007                       |
| Bosnia-Herzegovina (fed.) | Not allowed             | Not allowed                |
| Bulgaria                  | 2004                    | Not allowed                |
| Croatia                   | 2012                    | Not allowed                |
| Czechia                   | Not allowed             | Not allowed                |
| Denmark                   | 2006                    | 2006                       |
| Estonia                   | 1997                    | Not allowed                |
| Finland                   | 2007                    | 2007                       |
| France                    | 2021                    | 2021                       |
| Germany                   | 2018                    | 2018                       |
| Greece                    | 2002                    | Not allowed                |
| Hungary                   | 2005                    | Not allowed                |
| Iceland                   | 2010                    | 2006                       |
| Ireland                   | No specific law         | No specific law            |
| Italy                     | Not allowed             | Not allowed                |
| Latvia                    | 2002                    | Not allowed                |
| Lithuania                 | Not allowed             | Not allowed                |
| Malta                     | 2018                    | 2018                       |
| Netherlands               | 2002                    | 2002                       |
| Norway                    | 2020                    | 2008                       |
| Poland                    | Not allowed             | Not allowed                |
| Portugal                  | Not allowed             | 2016                       |
| Romania                   | No specific law         | No specific law            |
| Russia                    | 2003                    | Not allowed                |
| Serbia                    | Not allowed             | Not allowed                |
| Slovakia                  | Not allowed             | Not allowed                |
| Slovenia                  | Not allowed             | Not allowed                |
| Spain                     | 1988                    | 1988                       |
| Sweden                    | 2016                    | 2005                       |
| Switzerland               | Not allowed             | 2022                       |
| Turkey                    | Not allowed             | Not allowed                |
| United Kingdom            | 2008                    | 2008                       |
| Ukraine                   | 2013                    | Not allowed                |

Note: Details on the sources and explanations are available in the Supplementary material.

Table 2: Estimated attitudes towards same-sex parents in 2017–20 depending on individual characteristics and country-level factors (two-level mixed-effect regressions)

|  | M0: Empty model |      |         | M1: Contextual factors |      |         | M2: Full model |    |         |
|--|-----------------|------|---------|------------------------|------|---------|----------------|----|---------|
|  | Estimate        | se   | p-value | Estimate               | se   | p-value | Estimate       | se | p-value |
| Legislation in 2018 (ref=Single and lesbian)     |                 |      |         |                        |      |         |                |    |         |
| No specific law                                  | -0.915          | 0.38 | 0.024   | -0.141                 | 0.25 | 0.577   |                |    |         |
| Only different-sex couples                       | -0.802          | 0.21 | <0.001  | -0.395                 | 0.14 | 0.009   |                |    |         |
| Only single women                                | -1.041          | 0.24 | <0.001  | -0.381                 | 0.16 | 0.023   |                |    |         |
| Only lesbian couples                             | 0.036           | 0.34 | 0.916   | -0.025                 | 0.22 | 0.913   |                |    |         |
| Average acceptance of MAR                        | 0.275           | 0.10 | 0.009   | 0.078                  | 0.06 | 0.233   |                |    |         |
| Women (ref=Men)                                  |                 |      |         | 0.285                  | 0.01 | <0.001  |                |    |         |
| Age (ref=<20)                                    |                 |      |         |                        |      |         |                |    |         |
| 20–29  |                 |      |         | -0.019                 | 0.05 | 0.673   |                |    |         |
| 30–39  |                 |      |         | -0.061                 | 0.05 | 0.115   |                |    |         |
| 40–49  |                 |      |         | -0.082                 | 0.05 | 0.036   |                |    |         |
| 50–59  |                 |      |         | -0.107                 | 0.05 | 0.008   |                |    |         |
| 60 +   |                 |      |         | -0.181                 | 0.05 | <0.001  |                |    |         |
| Born in the surveyed country (ref=Yes)           |                 |      |         | -0.104                 | 0.03 | <0.001  |                |    |         |
| Education (ref=Low)                              |                 |      |         |                        |      |         |                |    |         |
| Medium   |                 |      |         | -0.126                 | 0.03 | <0.001  |                |    |         |
| High   |                 |      |         | -0.145                 | 0.03 | <0.001  |                |    |         |
| Employment status (ref=Full-time)                |                 |      |         |                        |      |         |                |    |         |
| Part-time  |                 |      |         | -0.013                 | 0.03 | 0.642   |                |    |         |
| Self-employed                                    |                 |      |         | -0.035                 | 0.03 | 0.251   |                |    |         |
| Unemployed                                       |                 |      |         | -0.010                 | 0.04 | 0.791   |                |    |         |
| In education                                     |                 |      |         | -0.154                 | 0.03 | <0.001  |                |    |         |
| Other  |                 |      |         | 0.015                  | 0.02 | 0.499   |                |    |         |
| Partnership status (ref=Cohabiting)              |                 |      |         |                        |      |         |                |    |         |
| Married  |                 |      |         | -0.072                 | 0.02 | -0.072  |                |    |         |
| Single   |                 |      |         | -0.061                 | 0.02 | -0.061  |                |    |         |
| Individual has children (ref=Childless)          |                 |      |         | -0.047                 | 0.02 | 0.017   |                |    |         |
| Religiosity                                      |                 |      |         | -0.055                 | 0.00 | <0.001  |                |    |         |
| Confidence in political parties (ref=Not at all) |                 |      |         |                        |      |         |                |    |         |
| Not very much                                    |                 |      |         | 0.047                  | 0.02 | 0.004   |                |    |         |
| Quite a lot                                      |                 |      |         | 0.124                  | 0.02 | <0.001  |                |    |         |

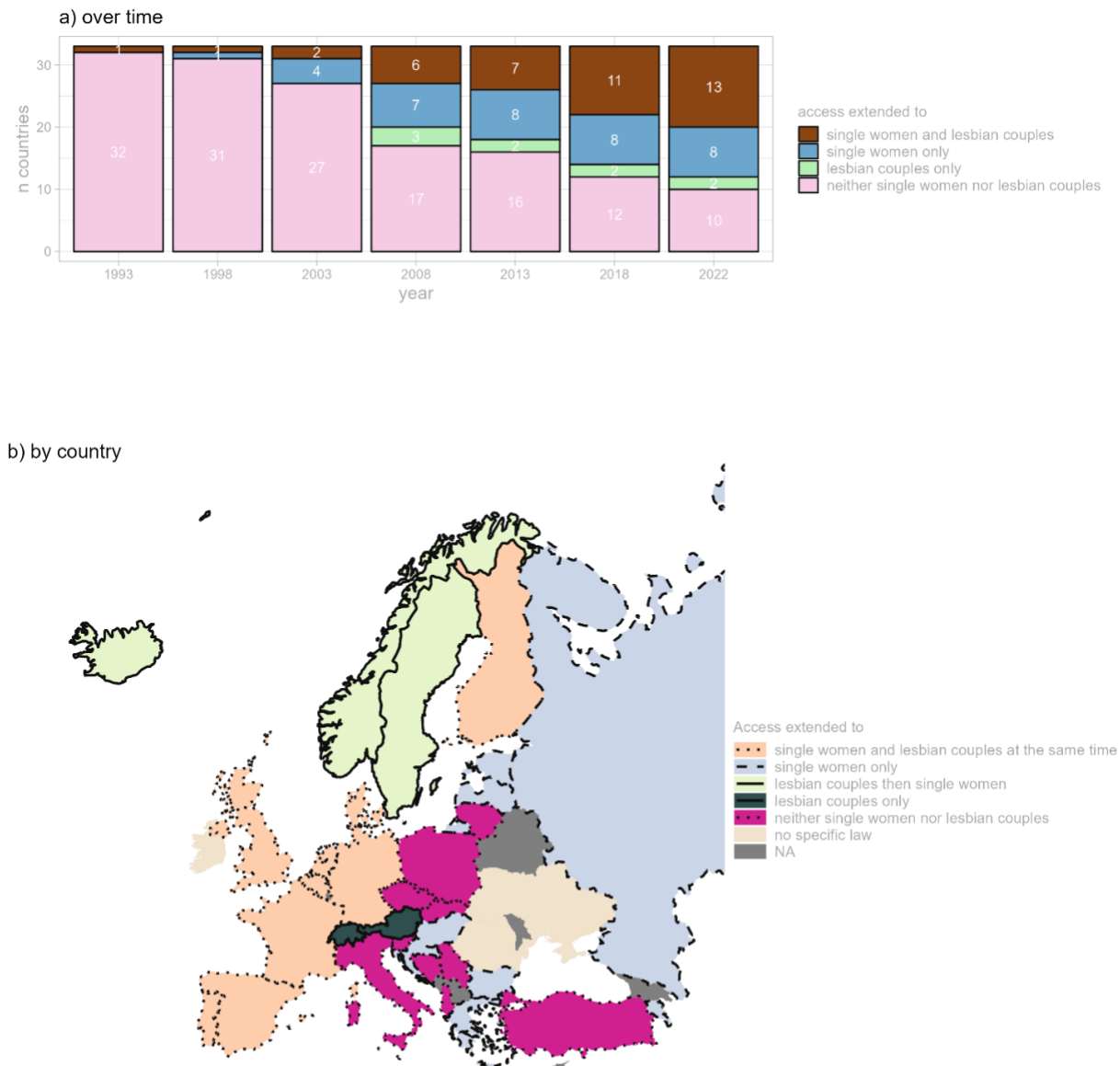
|                             |         |       |         |        |       |         |        |
|-----------------------------|---------|-------|---------|--------|-------|---------|--------|
| A great deal                |         |       |         |        | 0.261 | 0.05    | <0.001 |
| Acceptance of homosexuality |         |       |         |        | 0.172 | 0.00    | <0.001 |
| Intercept                   | 3.123   | 1.749 | 0.77    | 0.031  | 2.244 | 0.51    | <0.001 |
| Variance components         |         |       |         |        |       |         |        |
| Country level               | 0.74    | 0.19  | 0.43    |        | 0.13  | 0.36    |        |
| Individual level (fixed)    | 1.47    | 2.17  | 1.47    |        | 1.83  | 1.35    |        |
| Political views (random)    |         |       |         |        | 0.05  | 0.22    |        |
| Left-wing                   |         |       |         |        | 0.11  | 0.34    |        |
| Right-wing                  |         |       |         |        |       |         |        |
| AIC                         | 146,647 |       | 146,619 |        |       | 139,904 |        |
| N individuals               |         |       |         | 40,453 |       |         |        |
| N countries                 |         |       |         |        | 31    |         |        |

Source: EVS-5 (2017–20).

Note: se= standard error. AIC = Akaike Information Criterion.

## Figures

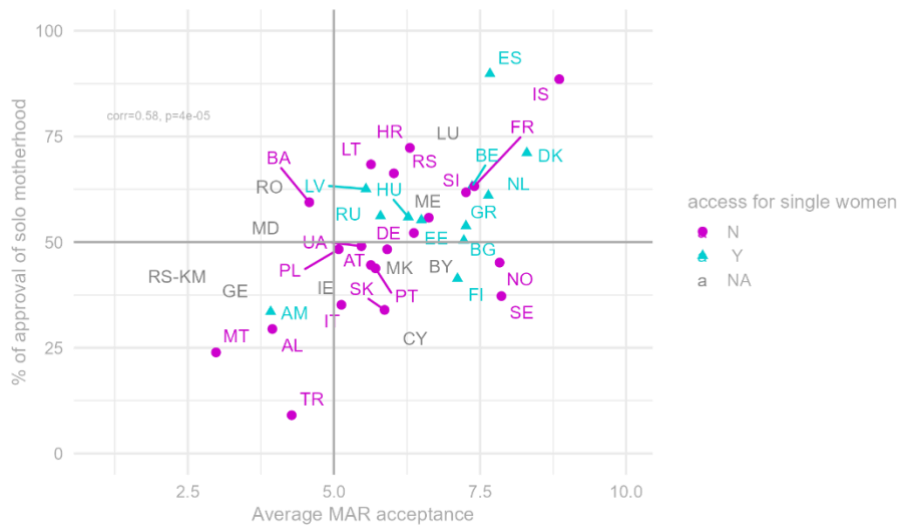
Figure 1: Variations in European legislation regarding which groups of women can access MAR



Source: Authors' data collection (see Table S1).

Note: Romania and Ireland are excluded from Figure 1a because of a lack of law regulating MAR.

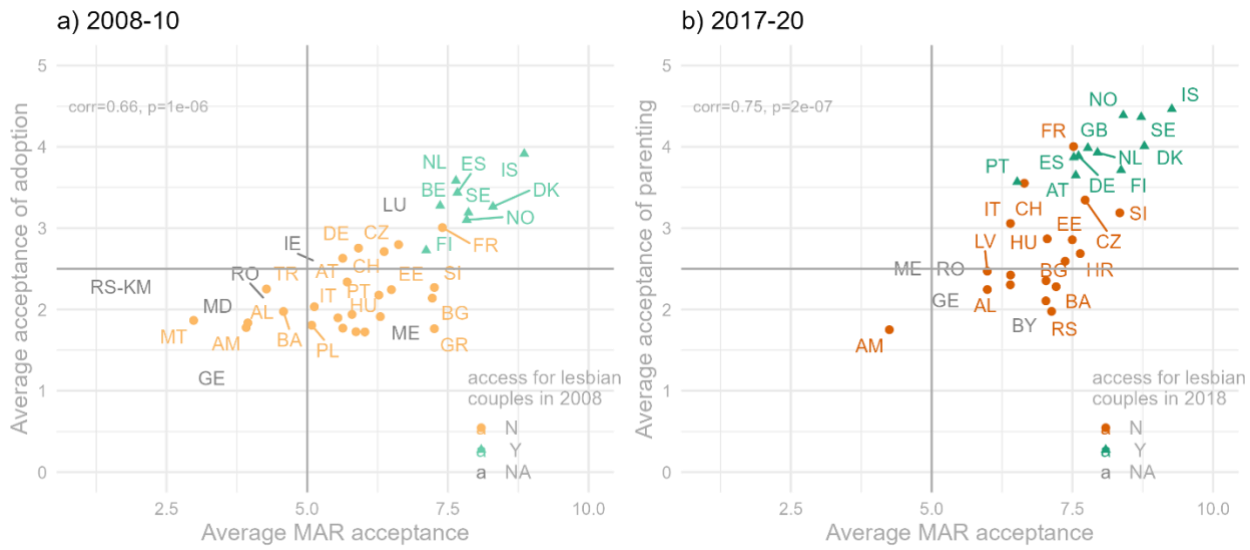
Figure 2: The association between MAR access for single women and public opinion towards single motherhood in 2008–10



Source: EVS-4 (2008–10).

Note: Data are weighted. The approval of single motherhood is measured with the following survey question: ‘If a woman wants to have a child as a single parent, but she does not want to have a stable relationship with a man, do you approve or disapprove?’. The acceptance of MAR is measured based on a scale from 1 to 10 representing ‘whether [individuals] think it can always be [(10)], never be justified [(0)], or something in between’ to use artificial insemination or in vitro fertilization.

Figure 3: The association between MAR access for lesbian couples and public opinion towards same-sex parents



Source: EVS-4 (2008–10) and 5 (2017–2020).

Note: Data are weighted. The acceptance of same-sex parents is measured with the following survey questions: a) ‘Homosexual couples should be able to adopt children’ and b) ‘Homosexual couples are as good parents as other couples’. The acceptance of MAR is measured based on a scale from 1 to 10 representing ‘whether [individuals] think it can always be [(10)], never be justified [(0)], or something in between’ to use artificial insemination or in vitro fertilization.

**Appendices**

Table A1: Approval of single motherhood by country and survey wave

|                    | Wave 2 (1989–93) |            |                    | Wave 3 (1999–2001) |            |                    | Wave 4 (2008–10) |            |                    |
|--------------------|------------------|------------|--------------------|--------------------|------------|--------------------|------------------|------------|--------------------|
|                    | Approve          | Disapprove | Don't know/depends | Approve            | Disapprove | Don't know/depends | Approve          | Disapprove | Don't know/depends |
| Albania            |                  |            |                    |                    |            |                    | 29.5             | 51.6       | 18.9               |
| Armenia            |                  |            |                    |                    |            |                    | 33.8             | 60.0       | 6.15               |
| Austria            | 39.9             | 23.6       | 36.5               | 39.5               | 22.4       | 38.1               | 44.1             | 30.4       | 25.5               |
| Belarus            |                  |            |                    | 63.3               | 18.4       | 18.3               | 60.6             | 26.7       | 12.6               |
| Belgium            | 33.7             | 29.1       | 37.1               | 55.6               | 30.7       | 13.7               | 60.7             | 33.1       | 6.21               |
| Bosnia-Herzegovina |                  |            |                    |                    |            |                    | 50.8             | 27.4       | 21.8               |
| Bulgaria           | 51.6             | 27.0       | 21.4               | 53.9               | 24.8       | 21.3               | 71.6             | 19.8       | 8.6                |
| Croatia            |                  |            |                    | 66.6               | 16.1       | 17.4               | 31.1             | 53.7       | 15.1               |
| Cyprus             |                  |            |                    |                    |            |                    | 56.0             | 20.6       | 23.4               |
| Czechia            | 31.0             | 39.7       | 29.3               | 42.3               | 27.0       | 30.6               | 70.8             | 19.7       | 9.46               |
| Denmark            | 69.2             | 17.2       | 13.6               | 52.4               | 33.8       | 13.7               | 53.7             | 28.3       | 18.0               |
| Estonia            | 32.8             | 48.5       | 18.6               | 29.9               | 18.0       | 52.1               | 41.2             | 13.1       | 45.7               |
| Finland            | 58.5             | 17.5       | 24.0               | 54.3               | 24.2       | 21.5               | 62.4             | 28.6       | 8.95               |
| France             | 38.3             | 22.5       | 39.2               | 52.7               | 24         | 23.3               | 35.6             | 44.9       | 19.5               |
| Georgia            |                  |            |                    |                    |            |                    | 46.9             | 31.0       | 22.1               |
| Germany            | 27.9             | 28.1       | 44.0               | 34.1               | 23.1       | 42.8               | 54.1             | 39.2       | 6.65               |
| Greece             |                  |            |                    | 31.4               | 39.5       | 29.1               | 55.9             | 40.0       | 4.09               |
| Hungary            | 41.5             | 40         | 18.6               | 41.5               | 31.6       | 26.9               | 87.8             | 9.21       | 2.96               |
| Iceland            | 83.4             | 6.25       | 10.3               | 81                 | 10.7       | 8.31               | 43.4             | 23.1       | 33.5               |
| Ireland            | 27.6             | 51.8       | 20.5               | 35.7               | 27.0       | 37.3               | 35.3             | 47.2       | 17.4               |
| Italy              | 41.4             | 37.2       | 21.5               | 28.8               | 35.2       | 36.1               | 38.9             | 46.9       | 14.2               |
| Kosovo             |                  |            |                    |                    |            |                    | 61.9             | 26.0       | 12.0               |
| Latvia             | 26.0             | 50.7       | 23.4               | 56.6               | 22.9       | 20.5               | 68.0             | 9.83       | 22.2               |
| Lithuania          | 56.7             | 21.8       | 21.5               | 62.1               | 8.98       | 28.9               | 63.0             | 26.1       | 10.9               |
| Luxembourg         |                  |            |                    | 47.1               | 29.0       | 23.9               | 29.5             | 51.6       | 18.9               |
| Macedonia          |                  |            |                    |                    |            |                    | 50.4             | 38.6       | 11.0               |
| Malta              | 17.5             | 65.6       | 16.9               | 56.6               | 22.9       | 20.5               | 24.7             | 60.8       | 14.4               |

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|----------------|-------------------------|------|------|------|------|------|------|------|------|
| Moldova        |                         |      |      |      |      |      | 48.9 | 34.7 | 16.4 |
| Montenegro     |                         |      |      |      |      |      | 55.7 | 36.9 | 7.44 |
| Netherlands    | 43.9                    | 35.7 | 20.5 | 55.7 | 23.9 | 20.4 | 61.2 | 31.5 | 7.22 |
| Norway         | 28.6                    | 46.9 | 24.5 |      |      |      | 44.7 | 27.6 | 27.8 |
| Poland         | 12.4                    | 41.7 | 45.9 | 41.5 | 17.0 | 41.5 | 48.5 | 27.0 | 24.5 |
| Portugal       | 43.1                    | 33.7 | 23.2 | 40.2 | 45.2 | 14.6 | 44.3 | 34.5 | 21.2 |
| Romania        | 39.9                    | 23.7 | 36.4 | 50.7 | 24.7 | 24.7 | 60.2 | 25.4 | 14.3 |
| Russia         |                         |      |      | 56.7 | 20.5 | 22.7 | 67.3 | 23.6 | 9.11 |
| Serbia         |                         |      |      |      |      |      | 56.0 | 25.4 | 18.5 |
| Slovakia       | 28.0                    | 38.5 | 33.6 | 24.4 | 26.7 | 49.0 | 34.8 | 23.4 | 41.8 |
| Slovenia       | 55.8                    | 21.9 | 22.3 | 55.4 | 16.9 | 27.7 | 61.5 | 29.2 | 9.29 |
| Spain          | 67.5                    | 16.3 | 16.2 | 71.6 | 10.3 | 18.1 | 87.1 | 9.51 | 3.38 |
| Sweden         | 22.8                    | 44.7 | 32.5 | 28.6 | 40.1 | 31.3 | 35.3 | 32.6 | 32.0 |
| Switzerland    |                         |      |      |      |      |      | 49.8 | 36.7 | 13.5 |
| United Kingdom | 42.5                    | 38.0 | 19.5 | 34.4 | 29.3 | 36.4 |      |      |      |

Source: EVS-2 (1989–1993), 3 (1999–2001) and 4 (2008–10).

Sample: Individuals aged 18–59 years old at the time of the survey.

Note: Data are weighted.



Table A2: Non-adjusted average acceptance of assisted reproduction and same-sex parents in 2008–10 and 2017–20 and shares of respondents acknowledging an opinion by country

|                    | 2008–10 |           |                               |           | 2017–20 |           |                             |           |
|--------------------|---------|-----------|-------------------------------|-----------|---------|-----------|-----------------------------|-----------|
|                    | MAR     |           | Adoption for same-sex parents |           | MAR     |           | Same-sex couples as parents |           |
|                    | mean    | ackn. (%) | mean                          | ackn. (%) | mean    | ackn. (%) | mean                        | ackn. (%) |
| Albania            | 4.4     | 90.6      | 2.1                           | 88.2      | 6.1     | 98.2      | 2.6                         | 85.4      |
| Armenia            | 4.1     | 94.9      | 1.9                           | 93.1      | 4.3     | 98.5      | 1.9                         | 93.9      |
| Austria            | 5.8     | 96.9      | 2.8                           | 95.0      | 7.7     | 97.8      | 3.9                         | 94.1      |
| Belarus            | 6.8     | 96.1      | 2.2                           | 92.4      | 7.2     | 96.8      | 2.1                         | 94.8      |
| Belgium            | 7.4     | 99.7      | 3.3                           | 99.8      |         |           |                             |           |
| Bosnia-Herzegovina | 4.6     | 98.6      | 2.0                           | 99.5      | 7.3     | 98.3      | 2.4                         | 96.2      |
| Bulgaria           | 7.8     | 92.6      | 2.3                           | 91.4      | 8.0     | 92.3      | 3.0                         | 87.2      |
| Croatia            | 6.4     | 98.4      | 2.0                           | 97.8      | 7.7     | 98.9      | 2.9                         | 92.6      |
| Czechia            | 6.9     | 95.8      | 2.9                           | 96.3      | 8.1     | 95.8      | 3.7                         | 91.4      |
| Cyprus             | 97.6    | 1.8       | 95.7                          |           |         |           |                             |           |
| Denmark            | 8.3     | 99.9      | 3.4                           | 97.3      | 8.8     | 100.0     | 4.0                         | 99.1      |
| Estonia            | 6.7     | 97.0      | 2.3                           | 96.7      | 7.8     | 95.6      | 3.3                         | 87.9      |
| Finland            | 7.6     | 94.0      | 2.9                           | 92.5      | 8.5     | 99.0      | 3.8                         | 98.9      |
| France             | 7.4     | 99.6      | 3.0                           | 99.4      | 7.8     | 96.7      | 4.2                         | 95.5      |
| Georgia            | 4.1     | 89.6      | 1.4                           | 93.3      | 5.0     | 96.0      | 2.1                         | 91.3      |
| Germany            | 6.0     | 98.8      | 2.9                           | 95.0      | 7.7     | 98.6      | 4.1                         | 94.2      |
| Greece             | 7.5     | 97.2      | 1.8                           | 98.0      |         |           |                             |           |
| Hungary            | 6.3     | 99.6      | 2.2                           | 98.6      | 7.2     | 97.9      | 3.2                         | 90.4      |
| Iceland            | 8.9     | 99.9      | 4.0                           | 99.0      | 9.3     | 99.9      | 4.5                         | 99.1      |
| Ireland            | 5.6     | 91.6      | 2.9                           | 90.2      |         |           |                             |           |
| Italy              | 5.4     | 95.5      | 2.1                           | 97.4      | 6.6     | 96.5      | 3.2                         | 95.0      |
| Kosovo             | 95.8    | 2.1       | 97.6                          |           |         |           |                             |           |
| Latvia             | 5.8     | 95.4      | 2.0                           | 93.5      | 6.8     | 87.4      | 2.7                         | 91.5      |
| Lithuania          | 6.2     | 90.6      | 2.0                           | 90.4      | 7.0     | 91.5      | 2.5                         | 91.9      |
| Luxembourg         | 7.0     | 98.8      | 3.2                           | 97.9      |         |           |                             |           |
| Macedonia          | 6.5     | 95.7      | 2.0                           | 96.9      | 7.2     | 97.1      | 2.4                         | 95.6      |
| Malta              | 3.9     | 76.6      | 2.0                           | 95.2      |         |           |                             |           |
| Moldova            | 3.9     | 89.2      | 2.0                           | 93.1      |         |           |                             |           |
| Montenegro         | 7.2     | 97.1      | 2.0                           | 96.9      | 5.0     | 98.8      | 2.4                         | 96.7      |
| Netherlands        | 7.7     | 99.6      | 3.6                           | 99.2      | 8.2     | 96.4      | 4.1                         | 96.4      |
| Norway             | 7.8     | 100.0     | 3.1                           | 100.0     | 8.4     | 100.0     | 4.4                         | 99.4      |
| Poland             | 5.3     | 95.6      | 1.9                           | 97.4      | 6.6     | 96.3      | 2.8                         | 87.6      |
| Portugal           | 6.1     | 94.0      | 2.4                           | 96.3      | 6.8     | 96.3      | 3.8                         | 93.3      |
| Romania            | 4.6     | 92.7      | 2.2                           | 96.5      | 5.9     | 96.9      | 2.8                         | 85.6      |
| Russia             | 6.3     | 92.2      | 2.2                           | 86.5      | 7.5     | 93.9      | 2.3                         | 91.6      |
| Serbia             | 6.2     | 97.1      | 1.8                           | 97.8      | 7.4     | 96.5      | 2.2                         | 91.4      |
| Slovakia           | 6.3     | 93.7      | 1.9                           | 92.1      | 7.1     | 99.2      | 2.4                         | 97.8      |
| Slovenia           | 7.3     | 99.5      | 2.3                           | 98.2      | 8.4     | 99.1      | 3.5                         | 92.0      |
| Spain              | 7.9     | 97.5      | 3.5                           | 98.2      | 7.6     | 99.0      | 4.0                         | 96.5      |
| Sweden             | 8.2     | 95.4      | 3.4                           | 92.9      | 8.8     | 99.4      | 4.4                         | 99.5      |
| Switzerland        | 6.4     | 98.8      | 2.8                           | 96.0      | 6.7     | 99.2      | 3.6                         | 98.4      |

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|                |     |      |     |      |     |      |     |      |
|----------------|-----|------|-----|------|-----|------|-----|------|
| Turkey         | 4.4 | 96.7 | 2.5 | 89.7 |     |      |     |      |
| United Kingdom |     |      |     |      | 7.9 | 98.6 | 4.0 | 99.3 |
| Ukraine        | 6.1 | 89.8 | 1.9 | 88.9 | 6.9 | 91.1 | 2.6 | 90.7 |

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Source: EVS-4 (2008–10) and 5 (2017–20).

Sample: Individuals aged 18–59 years old at the time of the survey born in the surveyed country.

Note: Data are weighted.

Table A3: Distribution of individual characteristics by country in 2017–20

| country            | n     | Women (%) | Childless (%) | Not born in the surveyed country (%) | Full-time employment (%) | Highly educated (%) | Single (%) | Average religious attendance | Low confidence in political parties (%) | Left-wing (%) | Mean acceptance of homosexuality |
|--------------------|-------|-----------|---------------|--------------------------------------|--------------------------|---------------------|------------|------------------------------|---|---------------|----------------------------------|
| Albania            | 1,046 | 48.8      | 21.0          | 0.3                                  | 15.3                     | 12.2                | 20.8       | 3.9                          | 70.6                                    | 52.6          | 2.1                              |
| Armenia            | 1,330 | 55.1      | 30.9          | 2.7                                  | 27.1                     | 0.4                 | 37.7       | 5.1                          | 32.9                                    | 65.6          | 1.4                              |
| Austria            | 1,398 | 52.3      | 39.8          | 10.3                                 | 51.0                     | 29.2                | 41.4       | 4.1                          | 18.0                                    | 58.4          | 6.9                              |
| Bosnia-Herzegovina | 1,424 | 51.4      | 29.8          | 1.9                                  | 31.0                     | 13.1                | 38.5       | 5.2                          | 52.5                                    | 49.2          | 1.9                              |
| Bulgaria           | 972   | 47.0      | 18.9          | 0.7                                  | 37.1                     | 19.2                | 28.4       | 4.6                          | 42.2                                    | 40.9          | 2.9                              |
| Croatia            | 1,192 | 49.7      | 32.8          | 9.7                                  | 38.0                     | 17.4                | 44.5       | 4.5                          | 60.5                                    | 56.5          | 3.8                              |
| Czechia            | 1,322 | 51.2      | 24.7          | 2.9                                  | 53.2                     | 19.0                | 36.6       | 3.0                          | 40.5                                    | 47.7          | 6.4                              |
| Denmark            | 3,031 | 50.1      | 35.2          | 8.9                                  | 56.3                     | 33.8                | 31.8       | 3.7                          | 12.0                                    | 59.6          | 8.7                              |
| Estonia            | 624   | 44.0      | 29.2          | 6.9                                  | 60.7                     | 43.1                | 24.9       | 3.0                          | 25.3                                    | 45.1          | 4.1                              |
| Finland            | 1,024 | 49.4      | 34.5          | 0.8                                  | 45.0                     | 35.5                | 34.3       | 3.7                          | 14.7                                    | 47.0          | 7.4                              |
| France             | 1,557 | 51.7      | 31.7          | 12.6                                 | 40.4                     | 33.2                | 47.6       | 3.1                          | 43.7                                    | 52.8          | 7.0                              |
| Germany            | 1,794 | 49.2      | 30.6          | 13.0                                 | 44.1                     | 26.2                | 28.7       | 3.7                          | 19.5                                    | 65.2          | 7.9                              |
| Hungary            | 1,194 | 52.2      | 33.7          | 2.4                                  | 52.2                     | 21.5                | 41.3       | 3.7                          | 36.3                                    | 45.9          | 4.0                              |
| Iceland            | 1,402 | 46.5      | 16.3          | 6.1                                  | 67.7                     | 36.5                | 23.7       | 3.2                          | 15.1                                    | 56.7          | 9.1                              |
| Italy              | 1,738 | 47.6      | 33.0          | 3.1                                  | 30.1                     | 14.1                | 36.9       | 4.9                          | 34.4                                    | 39.6          | 6.4                              |
| Latvia             | 1,054 | 56.0      | 23.9          | 8.8                                  | 52.6                     | 31.0                | 44.4       | 3.6                          | 46.5                                    | 37.6          | 3.5                              |
| Lithuania          | 791   | 54.7      | 27.9          | 1.4                                  | 58.1                     | 44.6                | 21.2       | 4.7                          | 21.4                                    | 37.8          | 2.9                              |
| Netherlands        | 2,057 | 49.8      | 34.2          | 8.0                                  | 39.3                     | 31.7                | 40.1       | 3.3                          | 16.2                                    | 44.7          | 8.8                              |
| Norway             | 993   | 48.9      | 28.8          | 11.3                                 | 57.6                     | 36.9                | 33.1       | 3.6                          | 6.1                                     | 55.7          | 8.7                              |
| Poland             | 1,097 | 49.8      | 25.7          | 0.8                                  | 49.6                     | 28.0                | 32.8       | 5.8                          | 41.8                                    | 39.3          | 3.9                              |
| Portugal           | 1,014 | 51.8      | 30.6          | 11.5                                 | 52.8                     | 17.1                | 39.2       | 4.3                          | 34.9                                    | 60.2          | 4.6                              |
| Romania            | 1,175 | 49.4      | 28.4          | 0.2                                  | 41.3                     | 15.3                | 28.0       | 5.6                          | 50.8                                    | 36.2          | 2.3                              |
| Russia             | 1,416 | 54.6      | 28.0          | 4.1                                  | 48.0                     | 29.9                | 46.4       | 3.8                          | 27.0                                    | 31.3          | 2.5                              |
| Serbia             | 827   | 47.7      | 20.7          | 3.8                                  | 44.6                     | 12.0                | 12.5       | 4.3                          | 40.9                                    | 40.9          | 2.3                              |

|                |       |      |      |      |      |      |      |     |      |      |     |
|----------------|-------|------|------|------|------|------|------|-----|------|------|-----|
| Slovakia       | 1,040 | 51.6 | 28.8 | 0.9  | 55.0 | 17.5 | 40.1 | 4.7 | 30.7 | 49.8 | 5.1 |
| Slovenia       | 854   | 49.9 | 26.8 | 8.8  | 52.2 | 27.1 | 29.4 | 4.0 | 42.9 | 70.6 | 5.8 |
| Spain          | 1,004 | 51.2 | 37.4 | 10.8 | 46.2 | 30.6 | 45.0 | 3.8 | 37.3 | 61.3 | 7.0 |
| Sweden         | 981   | 46.8 | 30.6 | 15.2 | 59.4 | 39.1 | 32.6 | 3.2 | 8.3  | 46.9 | 8.6 |
| Switzerland    | 2,754 | 49.9 | 37.9 | 21.9 | 46.9 | 37.2 | 29.7 | 3.5 | 12.6 | 58.3 | 7.8 |
| United Kingdom | 1,209 | 51.3 | 12.2 | 18.2 | 38.9 | 40.7 | 27.6 | 3.5 | 22.6 | 54.6 | 7.1 |
| Ukraine        | 1,229 | 54.2 | 28.8 | 6.1  | 41.7 | 25.5 | 41.4 | 4.6 | 47.3 | 29.0 | 2.7 |

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Source: EVS-5 (2017–20)

Note: Percentages and average values are calculated with weighted data

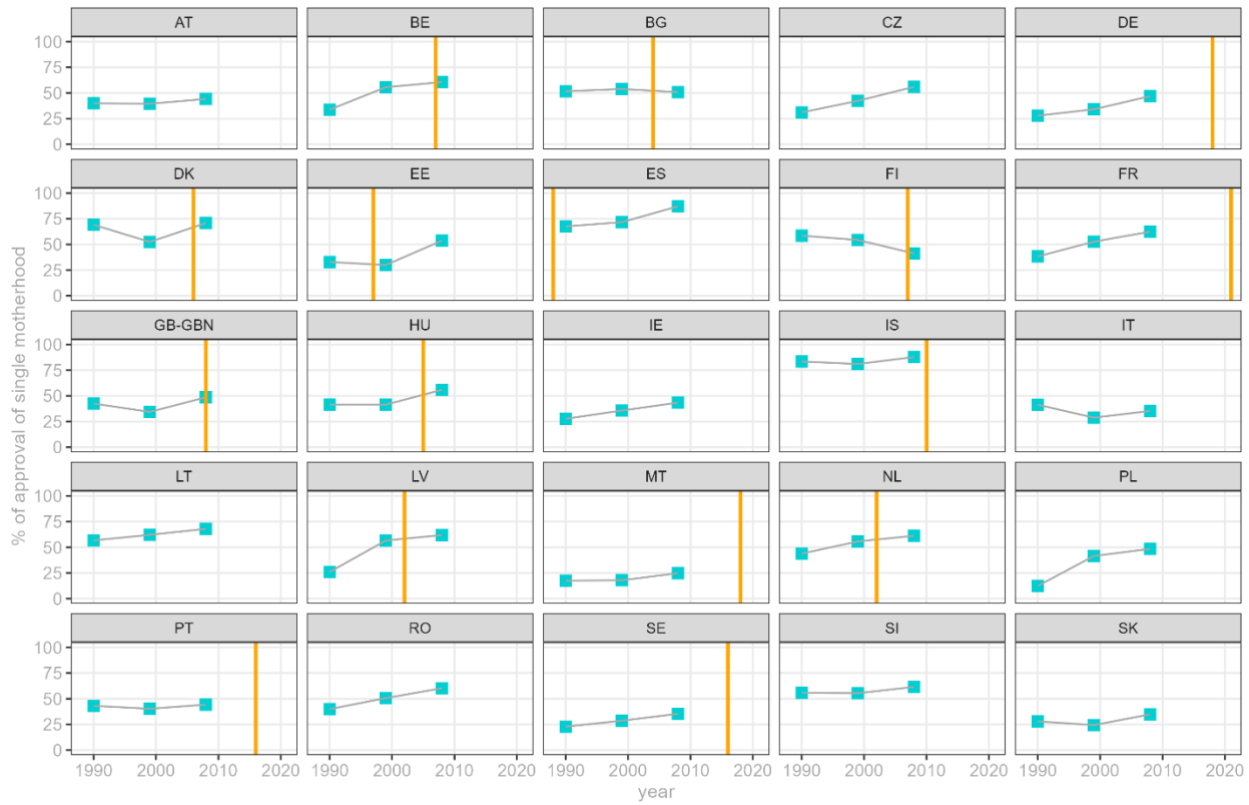
Table A4: Estimated attitudes towards same-sex parents in 2008–10 depending on individual characteristics and country-level factors (two-level linear regressions)

|  | Estimate | se      | p-value |
|--|----------|---------|---------|
| Legislation (ref=single and lesbian)             |          |         |         |
| no specific law                                  | -0.248   | 0.18    | 0.194   |
| only different-sex couples                       | -0.322   | 0.12    | 0.012   |
| only single women                                | -0.336   | 0.13    | 0.012   |
| only lesbian couples                             | -0.230   | 0.19    | 0.237   |
| Average acceptance of MAR                        | 0.019    | 0.04    | 0.645   |
| Women (ref=Men)                                  | 0.148    | 0.01    | <0.001  |
| Age (ref=<20)                                    |          |         |         |
| 20–29  | -0.003   | 0.03    | 0.929   |
| 30–39  | -0.080   | 0.04    | 0.031   |
| 40–49  | -0.114   | 0.04    | 0.002   |
| 50–59  | -0.188   | 0.04    | <0.001  |
| 60 +   | -0.269   | 0.04    | <0.001  |
| Born in the surveyed country (ref=No)            | 0.037    | 0.02    | 0.101   |
| Education (ref=Low)                              |          |         |         |
| Medium   | -0.009   | 0.02    | 0.677   |
| High   | 0.039    | 0.02    | 0.088   |
| Employment status (ref=Full-time)                |          |         |         |
| Part-time  | 0.085    | 0.03    | 0.001   |
| Self-employed                                    | -0.018   | 0.03    | 0.470   |
| Unemployed                                       | 0.076    | 0.02    | 0.001   |
| In education                                     | 0.108    | 0.03    | 0.001   |
| Other  | -0.027   | 0.02    | 0.128   |
| Partnership (ref=Cohabiting)                     |          |         |         |
| Married  | -0.084   | 0.02    | -0.084  |
| Single   | -0.042   | 0.02    | 0.054   |
| Frequency of religious services attendance       | -0.023   | 0.00    | <0.001  |
| Confidence in political parties (ref=Not at all) |          |         |         |
| Not very much                                    | -0.258   | 0.04    | 0.002   |
| Quite a lot                                      | -0.380   | 0.04    | < 0.001 |
| A great deal                                     | -0.463   | 0.04    | < 0.001 |
| Acceptance of homosexuality                      | 0.155    | 0.00    | < 0.001 |
| Intercept  | 2.315    | 0.31    | < 0.001 |
| Variance components                              |          |         |         |
| Country level                                    | 0.04     | 0.19    |         |
| Individual level (fixed)                         | 1.18     | 1.09    |         |
| Political views (random)                         |          |         |         |
| Left-wing  | 0.06     | 0.24    |         |
| Right-wing                                       | 0.02     | 0.15    |         |
| AIC  |          | 115,856 |         |
| N individuals                                    |          | 38,477  |         |
| N countries                                      |          | 33      |         |

Data: EVS-4 (2008–10).

Note: se= standard error. AIC = Akaike Information Criterion.

Figure A1: The timing of MAR legislation and public opinion towards single motherhood 1990-2020 in Europe



Source: EVS-2 (1989–1993), 3 (1999–2001) and 4 (2008–10).

Note: Data are weighted. The approval of single motherhood is measured with the following survey question: ‘If a woman wants to have a child as a single parent, but she does not want to have a stable relationship with a man, do you approve or disapprove?’. Vertical lines correspond to the year when single women were granted legal access to MAR.