# Part IV
# Fertility Ideals, Biographical Decisions and Assisted Reproduction

# Chapter 11
# Fertility Ideals of Women and Men Across the Life Course

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## 11.1 Introduction

"Ich möchte niemals **Kinder** sind für mich das Größte" ("I do not want **children** are the most important thing to me") was a slogan of the insurance company Swiss Life in 2015. The slogan ridicules the volatility of people's preferences regarding children and family life. Having children may evolve from being a subordinate issue to being the focal point of attention in a person's life. In our paper, we explore the volatility of women's and men's fertility ideals across time. In particular, we examine how fertility ideals evolve as people age, how patterns differ by gender, and whether other factors—such as changes in an individual's partnership or employment domain—lead to changes in fertility ideals. Our study contributes to the large body of literature that has explored different concepts of fertility desires and intentions in Germany (e.g., Buhr and Kuhnt 2012; Heiland et al. 2008; Keim et al. 2009; Kuhnt 2013; Kuhnt and Trappe 2013; Lutz et al. 2013; Marbach and Tölke 2013; Rost 2005; Ruckdeschel 2007), for other countries (e.g., Bernardi et al. 2015; Iacovou and Tavares 2011; Klobas and Ajzen 2015; Liefbroer 2009; Miller 2011;

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Morgan 1982; Quesnel-Vallée and Morgan 2004; Spéder and Kapitány 2015; Thomson 1997; Thomson and Hoem 1998; Vignoli et al. 2013) or across countries (e.g., Balbo and Mills 2011; Kapitány and Spéder 2013; Philipov et al. 2006; Puur et al. 2008; Régnier-Loilier et al. 2011; Testa 2007; Testa and Basten 2014).

While there are a large number of studies on this issue, little research has been done on the stability of fertility preferences. Most of the existing literature on fertility preferences has focused either on short-term fertility intentions (e.g., Billari et al. 2009; Dommermuth et al. 2011; Goldstein et al. 2003; Gray et al. 2013; Hayford 2009) or on the extent to which fertility intentions are realised (e.g., Berrington and Pattaro 2014; Schoen et al. 1999; Spéder and Kapitány 2009, 2015; Toulemon and Testa 2005). In our study, we investigate how the fertility ideals of women and men in Germany of the cohorts 1971–73, 1981–83, and 1991–93 evolved over a 5-year period spanning 2008/2009–2013/2014. Thus, our study covers a longer time period than most previous research. Fertility preferences are measured using the following question: "Under ideal circumstances, how many children would you like to have?" The aim of this question is to survey personal fertility ideals, rather than societal family size ideals, which were, for example, surveyed in the Eurobarometer (Testa 2007). The concept of personal fertility ideals is also different from the concept of fertility intentions, which is usually measured by asking respondents about their concrete plans for having a child within a narrowly defined time frame of, for example, 2 years (Miller 2011; Thomson 2001). It is, however, related to the widely used concept of fertility desires, which is usually measured by asking respondents how many children they wish to have (Thomson 2001: 5347). Compared to fertility intentions, fertility desires or ideals are probably more stable across time (Miller 1994, 2011). This is particularly the case given the first part of our question: the qualifier "under ideal circumstances" prompts the respondents to disregard the current conditions. We test whether significant changes in a person's life, such as the loss of a job or of a partner, affect his or her fertility ideals. We also examine whether the birth of a child (or the lack thereof) leads a person to adjust his or her fertility goals upwards or downwards. Here we draw upon the psychological literature that shows that people tend to revise their long-term goals if they are unable to accomplish them. For the sake of readability, we use the terms "fertility ideals" and "fertility preferences" interchangeably. The paper is structured as follows. In Sect. 11.2, we provide the theoretical background and review prior research findings. In Sect. 11.3, we describe the data we use, which come from the German Family Panel (pairfam) and cover respondents of the birth cohorts 1971–73, 1981–83, and 1991–93. Furthermore, we present our method and analytical strategy in this section. In Sect. 11.4, we present our descriptive results. In Sect. 11.5, we discuss our findings from the multivariate analyses, which consist of a pooled OLS regression and fixed-effects modelling. The dependent variable is the respondent's ideal number of children, and the main covariates are the respondent's partnership status, employment status, and number of children. In Sect. 11.6, we discuss the implications of our findings.

## 11.2 Theoretical Considerations and Prior Findings

The life course has been described as a self-referential process within which an individual acts or behaves based on his or her prior experiences and resources (Mayer 2004). Values, convictions, and emotions are part of the internal opportunity structure that guides individual behaviour (Huinink and Feldhaus 2009). Fertility ideals can be seen as fundamental and quite general value orientations, or as expressions of family size norms (Iacovou and Tavares 2011; Thomson 2001). However, there is some debate among researchers about how stable such value orientations are across the life course. According to the socialisation hypothesis, convictions and values are formed in late childhood and adolescence, and remain relatively stable thereafter. These values can be viewed as the concepts and scripts that guide an individual's future life plans (Inglehart 1977), or as mere lifestyle preferences (Hakim 2003). Others have raised concern over the stability of preferences across the life course. A person's values measured at a given moment in time not only influences action, but that action affects attitudes, values, and aspirations. The only way researchers can separate the causal linkage between attitudes and behaviour is by using panel data (Lesthaeghe and Moors 2002).

An important behavioural model that is often employed in the study of fertility preferences is the model of reasoned action developed by Ajzen and Fishbein (Ajzen 1991; Fishbein and Ajzen 2010). This concept distinguishes between desires and intentions (e.g., Bühler 2012; Miller 2011; Thomson 2001). Desires are "internal factors", such as motivations, attitudes, and beliefs (Miller 1994: 228). If desires become more manifest, they materialise into intentions, which will in turn be translated into behaviour if conditions are favourable. In our study, we analyse "fertility ideals", which are not examined as a distinct category in the Ajzen and Fishbein model. While it is clear that ideals are not the same as intentions, it is important to note that although fertility ideals are related to fertility desires, ideals and desires are not identical. Thus, previous findings on the volatility of fertility intentions and fertility desires may not be transferable to the study of the volatility of fertility ideals. We assume that fertility ideals, as measured by the phrase in our survey question "under ideal circumstances", are more stable than intentions, because ideals do not depend on actual living conditions (Miller 2011). Thus, a change in partnership status or economic circumstances may lead to a change in fertility intentions, but not necessarily in fertility ideals. However, if the adaptation argument applies, we can assume that the individual's achieved biographical status will affect his or her fertility ideals, as a person's current circumstances rarely align with his or her initial ideal scenario. For example, a woman might increase her ideal number of children so that it corresponds with the number of children she already has. Miller and Pasta (1995) have suggested that the birth of a first child can trigger in the parent an increase in his or her positive motivations for childbearing, as there is a biological mechanism that enhances the parent's positive responses to the baby, and thus strengthens his or her desire to have another child. Fertility preferences may also be adjusted upwards if an individual has an unplanned birth, or if his or her children do

not have the desired gender. These scholars have also posited that there are mechanisms that counterbalance this positive feedback loop, such as delays or negative motivations. Fertility ideals might be adjusted downwards if, for example, a woman who is growing older perceives that it is unlikely that her initial ideals will be fulfilled (Gray et al. 2013).

### *11.2.1 Previous Findings*

Relatively few studies have examined the stability of fertility ideals, desires, or intentions. Of the studies on the evolution of fertility expectations that exist, the most comprehensive was conducted by Hayford (2009) for women in the US. Hayford's analysis of 10 years of panel data collected between 1979 and 1994 showed that women tend to have relatively stable fertility expectations across their life course. For Europe, longitudinal studies on the stability of fertility desires or intentions have been conducted for the United Kingdom, France, Germany, and the Netherlands (Buhr and Kuhnt 2012; Heiland et al. 2008; Iacovou and Tavares 2011; Liefbroer 2009; Ní Bhrolcháin and Beaujouan 2011; Ní Bhrolcháin et al. 2010). However, most of these studies covered only two survey waves, and thus did not examine the evolution of fertility preferences across a longer period of time. These studies also differed considerably in terms of the concepts they used to measure fertility preferences. For example, some used fertility desires, while others used fertility expectations or intentions in assessing the "ideal family size". Despite the many conceptual differences between these studies, the following commonalities emerge.

Demographic factors, and especially age, have been shown to influence the stability of fertility intentions across an individual's life course. Fertility preferences seem to decline with increasing age (Gray et al. 2013; Hayford 2009; Heiland et al. 2008; Ní Bhrolcháin et al. 2010). Buhr and Kuhnt (2012: 291) found for Germany that over a period of 1 year, women and men in their early thirties are more likely than women and men in their early twenties to adjust the number of children they expect to have. Using data from the Netherlands, Liefbroer (2009: 363) showed that among both women and men, there is a downward adjustment in fertility intentions with increasing age. Using British panel data, Ni Bhroichain et al. (2010: 14) and Iacovou and Tavares (2011: 119) found a similar pattern: i.e., that the expected family size declines with increasing age. An intervening variable in this context may be fecundity, which also declines over time. Individuals who realize that they are infecund may adjust their fertility preferences in recognition of their biological constraints (Heiland et al. 2008; Liefbroer 2009; Régnier-Loilier 2006).

There is also longitudinal evidence that having a child leads to changes in fertility preferences. Heiland et al. (2008: 150) found that the fertility expectations of parents increase after the birth of an additional child. Similarly, Iacovou and Tavares (2011: 119) found that having a child is associated with upward and downward revisions in fertility expectations. However, their findings did not indicate that the birth of a first child has a greater effect on expectations than a subsequent birth.

There is also consistent evidence that changes in the partnership domain of the life course lead to changes in fertility preferences (Buhr and Kuhnt 2012; Iacovou and Tavares 2011; Spéder and Kapitány 2009). Buhr and Kuhnt (2012: 288) found considerable changes in the fertility intentions of men and women whose partnership situation had changed in the preceding year. Meanwhile, Hayford (2009: 777) found that married women have more stable fertility expectations than women who are single. Similarly, Heiland et al. (2008: 148) found that divorce or separation has a negative effect on the stability of the number of desired children among women. The findings of Iacovou and Tavares (2011: 119) indicate that having no partner or being separated from a partner is associated with a downward revision of fertility expectations across time.

Other studies have explored how changes in the employment domain of the life course relate to changes in fertility preferences. Heiland et al. (2008: 147) reported that unemployment has a negative, but insignificant effect on changes in the desired number of children. Buhr and Kuhnt (2012: 290) were unable to produce any statistically significant results supporting the notion that changes in labour force status affect fertility expectations. Iacovou and Tavares (2011: 119) studied the effect of income on fertility preferences. Their results show that while a man's income is not correlated with changes in the expected number of children, if a woman has a high income she tends to adjust her expected number of children downwards.

In summary, fertility preferences seem to be quite sensitive to changes in partnership status, but less sensitive to changes in economic circumstances. However, the psychological literature tells us that people may adjust their long-term goals based on the likelihood that they will achieve them. We therefore assume that the birth of (further) children may lead individuals to adjust their fertility ideals upwards.

## 11.3 Data and Analytical Strategy

This study uses data from the first six waves (2008/09–2013/14) of the German Family Panel (pairfam) and its supplement DemoDiff, release 6.0 (Brüderl et al. 2015). The German Family Panel (pairfam) is a panel survey that provides data on the formation and development of intimate relationships and families in Germany (Brüderl et al. 2015; Huinink et al. 2011). DemoDiff is a survey of residents of eastern Germany that is designed to complement the German Family Panel (Kreyenfeld et al. 2012). The pairfam and DemoDiff interviews are conducted annually with individuals from eastern and western Germany of the cohorts 1971–73, 1981–83, and 1991–93. The total number of respondents in wave 1 was 13,891. Overall attrition from wave 1 to wave 6 was about 46 %, which is within the normal range for panel studies in Germany with this duration (Müller and Castiglioni 2015). In our investigation, we have omitted respondents with invalid information on our key variables of interest, and especially those who failed to provide valid information on the ideal number of children or who said they were uncertain if they wanted children. The final sample includes 13,645 observations and 51,653 person-years of data.

### *11.3.1 Method & Analytical Strategy*

The empirical analysis consists of two parts. In a first step, we provide descriptive statistics that depict the development of fertility preferences by age and gender. Moreover, we employ OLS-regression that examines the determinants of fertility preferences. The dependent variable is the reported fertility ideal. In order to account for the multiple observations of individuals in the sample, we calculate robust standard errors. Moreover, we employ fixed-effects modelling to gain a better understanding of the causal determinants of fertility preferences. The great advantage of using fixed-effects modelling is that it allows us to account for individual-specific time-constant heterogeneity (Allison 2009; Andreß et al. 2013; Schmidt 2013; Brüderl and Ludwig 2014). The drawback is that only characteristics that vary over time may be included in the analysis as covariates. Our main focus in the multivariate analysis is on the effects on fertility preferences of the respondents' employment status, partnership status, subjective financial situation, and number of children. A further control variable is the respondents' age. In the OLS-regression, we also include region, and migration status.

Our main variable of interest is the response to the fertility ideals measured by the following question: Under ideal circumstances, how many children would you like to have? The dependent variable has a mean of 2.2 and ranges from zero to seven children.[1] Figure 11.1 shows that a majority of the respondents reported that they prefer to have two children. This finding is in line with those of previous studies on western Europe that showed that most people report that their ideal number of children is 2 (Goldstein et al. 2003; Testa 2007). The differences between women and men were minor: Men were more likely than women to say they prefer to have two children (men: 60 %; women: 55 %), while women were slightly more likely than men to say they prefer to have three or four children. Among both men and women, just six per cent reported that they see childlessness as the ideal (see Fig. 11.1).

The independent variables in our analysis are the respondent's age, partnership status, employment status, number of children, and subjective assessment of the financial situation of his or her household. Age is treated as a categorical variable broken down by the following age groups: 14–19, 20–29, 30–39, and 40–42. Partnership status is a dummy variable that distinguishes between being single and being in partnership, regardless of whether the respondent is living with the partner. We also control for the number of children, and distinguish between respondents who are childless, have one child, have two children, or have three or more children. Employment status is distinguished using the following categories: in education, full-time employment, part-time employment, unemployment, and other activities. The subjective assessment of the financial situation is an ordinal scaled variable that

[1] A few of the respondents in the initial data set reported an ideal number of children that was higher than seven. Since there were only a few such observations, and because they may have biased our analyses, we excluded them from our analytic sample.

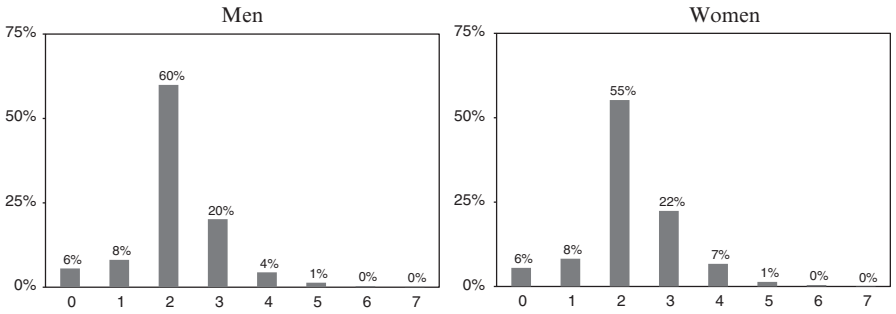


**Fig. 11.1** Ideal number of children by gender (Source: German Family Panel (pairfam) wave 1–6, Release 6.0, weighted estimates)

ranges from zero (not satisfied) to 10 (absolutely satisfied). While unemployment is an objective variable used to measure economic conditions, the perception of financial satisfaction is a more subjective variable. In the OLS-regression, we also control for (largely) fixed covariates, such as region (eastern or western Germany), migration background (born in Germany or born in a different country), and level of education. In generating the level of education, we use the ISCED-97 classification to distinguish between respondents with low (ISCED 0–2), medium (ISCED 3–4), and high levels of education (ISCED 5–6). Table 11.1 reports the sample statistics.

## 11.4 Descriptive Results

In a first step, we analyse the mean ideal number of children by age for men and women (see Fig. 11.2). Please note that we do not yet exploit the within variation, and that the graphs in Fig. 11.2 merely give the mean values of fertility ideals by the age of the respondents. We have separated the graphs by birth cohorts and gender. Among men in their early twenties, the average ideal number of children is 2.1. These values increase modestly to 2.2 children over the life course. On the whole, however, the fertility ideals of men do not seem to change much with age. Likewise, we see little variation in the ideal number of children among women. Whereas the ideal number of children increases slightly across the life course among men, the number decreases slightly among women. When they are in their twenties, women have an ideal number of children that is slightly higher than that of men. This number increases to 2.3 when they are in their thirties, and then declines to 2.1 when they are in their forties. However, the fluctuations are modest and are within the range of the statistical error margin of 95 %. We conclude that fertility ideals at an aggregate level of the cohorts under study are relatively stable, even though some variation exists.

In a second step, we examine the within variation of fertility ideals. Table 11.2 reports the between and within variation for fertility preferences by gender and

**Table 11.1** Composition of the sample by person-years, column per cent

| | Men | Women |
|---|---|---|
| **Ideal number of children** (Mean & std. error) | 2.17 (0.07) | 2.23 (0.06) |
| **Satisfaction with financial situation of household** (Mean & std. error) | 6.57 (0.02) | 6.45 (0.02) |
| **Age** | | |
| 14–19 | 26 % | 24 % |
| 20–29 | 33 % | 31 % |
| 30–39 | 31 % | 35 % |
| 40–42 | 10 % | 11 % |
| **Region** | | |
| West | 72 % | 73 % |
| East | 28 % | 27 % |
| **Country of birth** | | |
| Born in Germany | 91 % | 89 % |
| Not born in Germany | 9 % | 11 % |
| **Number of children** | | |
| Childless | 68 % | 53 % |
| 1 child | 13 % | 18 % |
| 2 children | 14 % | 20 % |
| 3 and more children | 6 % | 9 % |
| **Partnership status** | | |
| No Partner | 41 % | 29 % |
| Partner | 59 % | 71 % |
| **Level of education** | | |
| Low | 40 % | 37 % |
| Medium | 39 % | 42 % |
| High | 21 % | 21 % |
| Missing | 0 % | 0 % |
| **Employment status** | | |
| In education | 3 % | 3 % |
| Employed full-time | 85 % | 56 % |
| Employed part-time | 3 % | 22 % |
| Unemployed | 6 % | 5 % |
| Other | 3 % | 15 % |
| Person years | 24,586 | 27,067 |
| Subjects | 6,628 | 7,017 |

Source: German Family Panel (pairfam) wave 1–6, Release 6.0

region. The most important finding displayed in this table is that variation between individuals is much larger than variation within an individual. But there is still substantial within variation, which suggests that a considerable fraction of the population under study change their fertility ideals over survey waves. While men and women do not seem to differ, some differences are found between eastern and western Germany. On average, fertility ideals are higher in western than in eastern Germany, and are more stable in eastern than in western Germany.

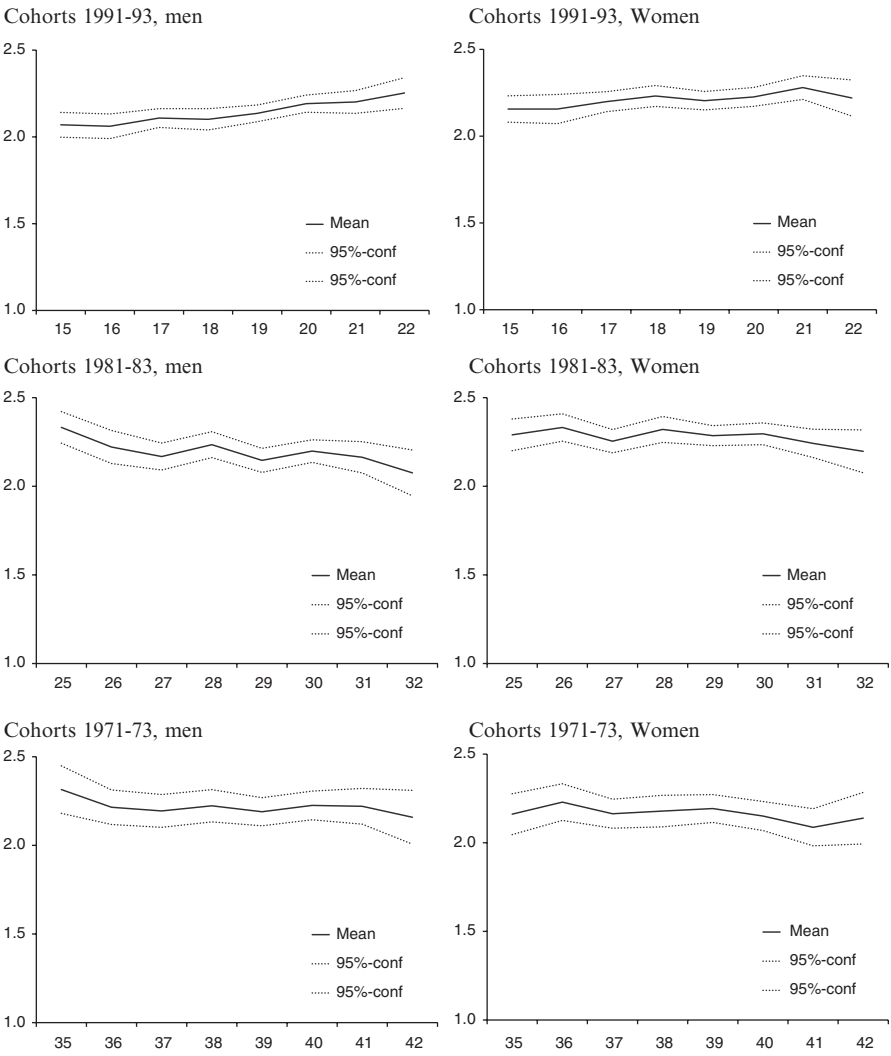


**Fig. 11.2** Ideal family size by age, cohort and sex, mean and 95 % confidence level. (Source: German Family Panel (pairfam) wave 1–6, Release 6.0, weighted estimates)

## 11.5 Multivariate Results

Table 11.3 displays the results from the OLS models, separately for men and women. We start by discussing our findings on partnership status and economic conditions. With respect to partnership status, we find that men with a partner have a significantly higher fertility ideal than men without a partner. This association does not hold for women, however. Respondents who are (still) in education have higher fertility preferences than those in full-time employment. This finding might

**Table 11.2** Within and between variation of fertility ideals

| | Mean | St. Dev. | | | Person-years |
|---|---|---|---|---|---|
| | | Overall | Between | Within | |
| All | 2.20 | 0.96 | 0.87 | 0.49 | 51,653 |
| Gender | | | | | |
| Men | 2.16 | 0.93 | 0.85 | 0.50 | 24,586 |
| Women | 2.23 | 0.98 | 0.89 | 0.49 | 27,067 |
| Region | | | | | |
| West Germany | 2.24 | 0.97 | 0.89 | 0.51 | 37,230 |
| East Germany | 2.08 | 0.90 | 0.82 | 0.45 | 14,423 |

Source: German Family Panel (pairfam) wave 1–6, Release 6.0

be a reflection of the respondents' life course stage, rather than of their economic situation. Unemployment does not seem to be associated with lower fertility preferences, as we do not find statistically significant differences in the preferences of respondents depending on whether they are employed. We also find that fertility preferences do not appear to be associated with satisfaction with the household's financial situation. In addition, we find that the level of education matters for fertility preferences: The respondents who are highly educated are more likely to prefer having a large family than their less educated counterparts. This result for women is particularly surprising, as we know from other studies that highly educated women in Germany are more likely than other women to remain childless (see Kreyenfeld and Konietzka in this volume).

When we look at the effect of age, we find that fertility preferences decline significantly across the life course. On average, men's fertility preferences at age 40–42 are by 0.36 units lower than at ages 14–19. Among women, there is even a reduction by 0.59 units, which may be indicative of a stronger awareness of biological constraints. Please note that this stands in some contrast to the descriptive findings that did not show a strong age-gradient. Thus, the control variables seem to be suppressors in the relationship between age and fertility preferences. The ideal number of children is lower among eastern than western Germans. This result is consistent with previous descriptive findings indicating that most eastern Germans prefer to have a smaller family (Buhr and Huinink 2010). In line with previous studies on the fertility behaviour of foreigners and migrants in Germany, we find that ideal number of children is higher among foreign-born than native-born respondents (Helfferich et al. 2011; Schmid and Kohls 2011). The number of children also has a very strong effect on preferred fertility, as men and women who already have three or more children have a higher ideal number of children than other respondents. This finding is not surprising. First, we can assume that respondents who are more family-oriented and have a large number of children at the time of the interview will also report that they have a high "fertility ideal". Second, as their number of children increases, respondents will adjust their ideal to their family situation. These two mechanisms cannot be disentangled in the OLS-regression, but they can be addressed in the fixed-effects models below. Taken together, the findings from the

**Table 11.3** Results from OLS regression, dependent variable: fertility ideals, beta coefficient and standard errors, (standard errors are adjusted for clustering in id)

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | b | Std. err. | | b | Std. err. | |
| **Age** | | | | | | |
| 14–19 | 1 | | | 1 | | |
| 20–29 | 0.02 | 0.02 | | −0.06 | 0.02 | ** |
| 30–39 | −0.20 | 0.03 | *** | −0.42 | 0.04 | *** |
| 40–42 | −0.36 | 0.04 | *** | −0.59 | 0.04 | *** |
| **Region** | | | | | | |
| Western Germany | 1 | | | 1 | | |
| Eastern Germany | −0.13 | 0.02 | *** | −0.14 | 0.02 | *** |
| **Migration status** | | | | | | |
| Born in Germany | 1 | | | 1 | | |
| Born in other country | 0.19 | 0.04 | *** | 0.08 | 0.04 | ** |
| **Number of children** | | | | | | |
| Childless | −0.17 | 0.03 | *** | −0.25 | 0.03 | *** |
| 1 child | 1 | | | 1 | | |
| 2 children | 0.32 | 0.03 | *** | 0.39 | 0.03 | *** |
| 3 or more children | 1.35 | 0.05 | *** | 1.33 | 0.05 | *** |
| **Partnership status** | | | | | | |
| No Partner | 1 | | | 1 | | |
| Partner | 0.04 | 0.02 | *** | −0.02 | 0.02 | |
| **Level of education** | | | | | | |
| Low | −0.14 | 0.03 | *** | −0.11 | 0.03 | *** |
| Medium | 1 | | | 1 | | |
| High | 0.05 | 0.03 | | 0.10 | 0.03 | *** |
| Other/Missing | 0.86 | 0.05 | *** | – | | |
| **Employment status** | | | | | | |
| In education | 0.15 | 0.07 | ** | 0.16 | 0.05 | *** |
| Employed full-time | 1 | | | 1 | | |
| Employed part-time | 0.03 | 0.05 | | 0.01 | 0.03 | |
| Unemployed | 0.01 | 0.07 | | −0.05 | 0.04 | |
| Other/Missing | 0.07 | 0.07 | | 0.02 | 0.03 | |
| **Satisfaction with financial situation of household** | 0.002 | 0.00 | | 0.007 | 0.00 | * |
| Constant | 2.24 | 0.07 | *** | 2.40 | 0.05 | *** |
| R squared | 0.17 | | | 0.19 | | |
| N (Person-years) | 24,586 | | | 27,067 | | |

Source: German Family Panel (pairfam) wave 1–6, Release 6.0
Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

OLS-regression reveal only weak associations between current living conditions, partnership status, and fertility ideals.

Next, we turn to the results from the fixed-effects model (Table 11.4). Fixed-effects modelling accounts for unobserved heterogeneity by "de-meaning" the data. Because fixed-effects analysis only draws on the within variation of individuals, the power of the model is lower than that of OLS-regressions. It is therefore more difficult to generate significant results with fixed-effects regressions than with OLS-modelling. However, even if we allowed for a very generous level of significance, the coefficients for partnership status or economic conditions do not come close to having an acceptable level of statistical significance. From this analysis, we conclude that neither

**Table 11.4** Results from fixed-effects model, dependent variable: fertility ideals, beta coefficient and standard errors

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | b | Std. err. | | b | Std. err. | |
| **Age** | | | | | | |
| 14–19 | 1 | | | 1 | | |
| 20–29 | 0.02 | 0.02 | | −0.01 | 0.02 | *** |
| 30–39 | 0.01 | 0.02 | | −0.06 | 0.02 | *** |
| 40–42 | −0.02 | 0.03 | | −0.13 | 0.03 | *** |
| **Number of children** | | | | | | |
| Childless | −0.09 | 0.03 | ** | −0.09 | 0.04 | *** |
| 1 child | 1 | | | 1 | | |
| 2 children | 0.19 | 0.04 | *** | 0.13 | 0.03 | *** |
| 3 or more children | 0.41 | 0.07 | *** | 0.48 | 0.06 | *** |
| **Partnership status** | | | | | | |
| No Partner | 0.02 | 0.02 | | 0.02 | 0.02 | |
| Partner | 1 | | | 1 | | |
| **Employment status** | | | | | | |
| In education | 0.00 | 0.05 | | 0.00 | 0.04 | |
| Employed full-time | −0.04 | 0.03 | | −0.02 | 0.02 | |
| Employed part-time | −0.02 | 0.04 | | 0.01 | 0.03 | |
| Unemployed | 1 | | | 1 | | |
| Other/Missing | −0.02 | 0.04 | | −0.04 | 0.02 | * |
| **Satisfaction with financial situation of household** | 0.002 | 0.00 | | 0.002 | 0.00 | |
| Constant | 2.18 | 0.05 | *** | 2.24 | 0.04 | *** |
| **R square** | | | | | | |
| Within | 0.01 | | | 0.01 | | |
| Between | 0.14 | | | 0.19 | | |
| Overvall | 0.11 | | | 0.15 | | |
| N (Person-years) | 24,586 | | | 27,067 | | |

Source: German Family Panel (pairfam) wave 1–6, Release 6.0
Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

changes in partnership status nor changes in economic conditions impact fertility preferences. What does seem to matter, however, is the number of children a respondent has. Since fixed-effects models exploit the within variation, the coefficients tell us that the respondents whose number of children changed across the panel waves also changed their fertility preferences. As their number of children increased, the respondents adjusted their preferences upwards. This finding is fully in line with the argument by Miller and Pasta (1995) that the birth of a first child in particular increases the motivation for further childbearing. This may be attributable to a justification mechanism whereby each child born will be treated as if he or she was intended. Another potential explanation is that the respondents became more knowledgeable about the advantages and disadvantages of parenthood after the birth of a child, and that those who experienced parenthood as an overwhelmingly positive event came to associate having a larger number of children with more gains, and thus increased their fertility ideals. Interestingly, in the fixed-effects model the negative impact of age on fertility ideals disappears among men, and is found among women only. Among women, age has a negative effect on fertility preferences. This suggests that as women age they adjust their fertility ideals downwards, most likely because they become aware that it is unlikely that they will be able to achieve their initial goals.

## 11.6 Conclusion

In this paper, we investigated the evolution of fertility preferences in Germany across six waves of panel data. Preferences were measured using the following question: "Under ideal circumstances, how many children would you like to have?" We find that, on average, men and women prefer to have 2.2 children. The average number of "preferred children" slightly declines with increasing age. We also find that there is some variation in fertility ideals within individuals across time. We examined if these individual-level variations in fertility ideals would be related to changes in the respondent's partnership status or economic or employment situation. In a pooled OLS-regression, we show that satisfaction with the economic situation is positively related with fertility preferences among women, while having a partner has a positive impact on fertility ideals among men. However, the fixed-effects model that accounts for individual time-invariant heterogeneity did not confirm these findings. A major result of our analysis is therefore that fertility preferences, measured as "personal ideals," are relatively unaffected by short-term changes in life circumstances. These results support the findings of previous studies that showed that economic conditions do not significantly affect fertility preferences (e.g., Heiland et al. 2008; Iacovou and Tavares 2011). However, they are at odds with the findings of studies that found that partnership dissolution affects the desired number of children (Gray et al. 2013). The discrepancies between these findings may be explained by how fertility preferences are operationalised in our study. We used "fertility ideals" as a dependent variable. In the interview, the respondents were asked to report their desired number of children "under ideal

circumstances." Because the respondents were asked to disregard their current circumstances, they may not have factored in their current employment situation or their partnership status.

While our findings indicate that partnership and economic conditions do not alter fertility ideals, they also show that an increase in the number of children in the respondent's family is associated with an upward adjustment of fertility preferences. Among women, increasing age is associated with a downward adjustment. This in turn suggests that individual-level variation in fertility ideals is largely explained by factors that are closely linked to goal achievement, such as the number of children already born and the woman's age. These findings are consistent with psychological theories of goal adjustment: i.e., that individuals will revise their fertility preferences if they perceive that it is unlikely that their initial goal will be realised, and that they will also change their preferences if they have more children than they had initially considered ideal. In sum, fertility ideals seem to be unaffected by short-term changes in the respondents' partnership status and employment situation, but they are sensitive to the achievement of long-term goals. In order to gain a more comprehensive understanding of the volatility of fertility ideals, we therefore need to have data that capture a long-term perspective. Only by using a sufficiently long-term panel will we be able to unravel the process through which people adjust their preferences based on their life course experiences. We were fortunate to have had access to 5 years of panel data. However, even this time horizon is short, as it captures only a snap-shot of the life course of an individual. For example, we were unable to produce any statistically significant results on the effects of union dissolution or unemployment on fertility preferences. We were also unable to explore whether previous disruptions in an individual's union or employment career affected the evolution of his or her fertility preferences. Unemployment or the lack of a suitable partner may not have an immediate impact on fertility preferences, but having a long history of economic hardship or complex partnerships may result in a downward or upward adjustment of fertility ideals at later ages. A direction for future research would be a systematic study of the long-term impact of the economic and partnership situations of individuals on their fertility preferences based on different concepts, such as personal ideals, desires, and intentions.

## Literature

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179–211.

Allison, P. D. (2009). *Fixed effects regression models*. Thousand Oaks: Sage.

Andreß, H.-J., Golsch, K., & Schmidt, A. (2013). *Applied panel data analysis for economic and social surveys*. New York: Springer.

Balbo, N., & Mills, M. (2011). The effects of social capital and social pressure on the intention to have a second or third child in France, Germany, and Bulgaria, 2004–05. *Population Studies, 65*, 335–351.

Bernardi, L., Mynarska, M., & Rossier, C. (2015). Uncertain, changing and situated fertility intentions. In D. Philipov, A. C. Liefbroer, & J. Klobas (Eds.), *Reproductive decision-making in a macro-micro perspective* (pp. 113–139). Dordrecht: Springer.

Berrington, A., & Pattaro, S. (2014). Educational differences in fertility desires, intentions and behaviour: A life course perspective. *Advances in Life Course Research, 21*, 10–27.

Billari, F. C., Philipov, D., & Testa, M. R. (2009). Attitudes, norms and perceived behavioural control: Explaining fertility intentions in Bulgaria. *European Journal of Population/Revue européenne de Démographie, 25*, 439–465.

Brüderl, J., & Ludwig, V. (2014). Fixed-effects panel regression. In H. Best & C. Wolf (Eds.), *SAGE handbook of regression analysis and causal inference* (pp. 327–359). London: Sage.

Brüderl, J., Hajek, K., Herzig, M., Huyer-May, B., Lenke, R., Müller, B., Schüzte, P., & Schumann, N. (2015). *Pairfam data manual, Release 6.0*. München: Universität München.

Bühler, C. (2012). *How to measure preferred family size? A discussion of different approaches*. Leibniz Universität Hannover: Unpublished manuscript.

Buhr, P., & Huinink, J. (2010). Kinderwünsche von Männern und Frauen. In J. Goldstein, M. Kreyenfeld, J. Huinink, D. Konietzka, & H. Trappe (Eds.), *Familie und Partnerschaft in Ost- und Westdeutschland – Ergebnisse im Rahmen des Projektes Demographic differences in life course dynamics in eastern and western Germany* (pp. 18–19). Rostock: Max-Planck-Institut für demografische Forschung.

Buhr, P., & Kuhnt, A.-K. (2012). Die kurzfristige Stabilität des Kinderwunsches von Kinderlosen in Ost-und Westdeutschland: eine Analyse mit den ersten beiden Wellen des deutschen Beziehungs-und Familienpanels. *Zeitschrift für Familienforschung, Sonderheft, 2012*, 275–297.

Dommermuth, L., Klobas, J., & Lappegård, T. (2011). Now or later? The theory of planned behavior and timing of fertility intentions. *Advances in Life Course Research, 16*, 42–53.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Taylor & Francis.

Goldstein, J., Lutz, W., & Testa, M. R. (2003). The emergence of sub-replacement family size ideals in Europe. *Population Research and Policy Review, 22*, 479–496.

Gray, E., Evans, A., & Reimondos, A. (2013). Childbearing desires of childless men and women: When are goals adjusted? *Advances in Life Course Research, 18*, 141–149.

Hakim, C. (2003). A new approach to explaining fertility patterns: Preference theory. *Population and Development Review, 29*, 349–374.

Hayford, S. R. (2009). The evolution of fertility expectations over the life course. *Demography, 46*, 765–783.

Heiland, F., Prskawetz, A., & Sanderson, W. C. (2008). Are individuals' desired family sizes stable? Evidence from West German panel data. *European Journal of Population/Revue européenne de Démographie, 24*, 129–156.

Helfferich, C., Klindworth, H., & Kruse, J. (2011). *frauen leben – Familienplanung und Migration im Lebenslauf*. Köln: Bundeszentrale für gesundheitliche Aufklärung.

Huinink, J., & Feldhaus, M. (2009). Family research from the life course perspective. *International Sociology, 24*, 299–324.

Huinink, J., Brüderl, J., Nauck, B., Walper, S., Castiglioni, L., & Feldhaus, M. (2011). Panel analysis of intimate relationships and family dynamics (pairfam): Conceptual framework and design. *Zeitschrift für Familienforschung, 23*, 77–101.

Iacovou, M., & Tavares, L. P. (2011). Yearning, learning, and conceding: Reasons men and women change their childbearing intentions. *Population and Development Review, 37*, 89–123.

Inglehart, R. (1977). *The silent revolution*. Princeton: Princeton University Press.

Kapitány, B., & Spéder, Z. (2013). Realization, postponement or abandonment of childbearing intentions in four European countries. *Population, 67*, 599–629.

Keim, S., Klärner, A., & Bernardi, L. (2009). Qualifying social influence on fertility intentions composition, structure and meaning of fertility-relevant social networks in Western Germany. *Current Sociology, 57*, 888–907.

Klobas, J. E., & Ajzen, I. (2015). Making the decision to have a child. In D. Philipov, A. C. Liefbroer, & J. E. Klobas (Eds.), *Reproductive decision-making in a macro-micro environment* (pp. 41–78). Dordrecht: Springer.

Kreyenfeld, M., Huinink, J., Trappe, H., & Walke, R. (2012). DemoDiff: A dataset for the study of family change in eastern (and western) Germany. *Schmollers Jahrbuch, 132*, 653–660.

Kuhnt, A.-K. (2013). Ja, nein, vielleicht? Der Einfluss der Partnerschaftsqualität auf die Übereinstimmung der Elternschaftsabsichten von Paaren. *Zeitschrift für Familienforschung, 25*, 365–388.

Kuhnt, A.-K., & Trappe, H. (2013). *Easier said than done: Childbearing intentions and their realization in a short term perspective* (MPIDR working paper WP 2013–018: Max Planck Institute for Demographic Research). Rostock: Rostock Max-Planck-Institut für demografische Forschung.

Lesthaeghe, R., & Moors, G. (2002). Life course transitions and value orientations: selection and adaptation. In R. Lesthaeghe (Ed.), *Meaning and choice: Value orientations and life course decisions* (pp. 1–44). Brussels: CBGS.

Liefbroer, A. C. (2009). Changes in family size intentions across young adulthood: A life-course perspective. *European Journal of Population/Revue européenne de Démographie, 25*, 363–386.

Lutz, K., Buhr, P., & Boehnke, M. (2013). Die Bedeutung der Erfahrungen mit dem ersten Kind für die Intention zur Familienerweiterung. *Zeitschrift für Soziologie der Erziehung und Sozialisation, 33*, 169–186.

Marbach, J. H., & Tölke, A. (2013). Frauen, Männer und Familie. Lebensorientierung, Kinderwunsch und Vaterrolle. In D. Konietzka & M. Kreyenfeld (Eds.), *Ein Leben ohne Kinder: Ausmaß, Strukturen und Ursachen von Kinderlosigkeit* (pp. 281–310). Wiesbaden: Springer VS.

Mayer, K. U. (2004). Whose lives? How history, societies and institutions define and shape life courses. *Research in Human Development, 1*, 161–187.

Miller, W. B. (1994). Childbearing motivations, desires, and intentions: A theoretical framework. *Genetic, Social, and General Psychology Monographs, 120*, 223–258.

Miller, W. B. (2011). Differences between fertility desires and intentions: Implications for theory, research and policy. *Vienna Yearbook of Population Research, 9*, 75–98.

Miller, W. B., & Pasta, D. J. (1995). How does childbearing affect fertility motivations and desires? *Social Biology, 42*, 185–198.

Morgan, S. P. (1982). Parity-specific fertility intentions and uncertainty: The United States, 1970 to 1976. *Demography, 19*, 315–334.

Müller, B., & Castiglioni, L. (2015). Attrition im Beziehungs- und Familienpanel pairfam. In J. Schupp & C. Wolf (Eds.), *Nonresponse Bias* (pp. 383–408). Wiesbaden: Springer.

Ní Bhrolcháin, M., & Beaujouan, É. (2011). Uncertainty in fertility intentions in Britain. *Vienna Yearbook of Population Research, 9*, 99–129.

Ní Bhrolcháin, M., Beaujouan, E., & Berrington, A. (2010). Stability and change in fertility intentions in Britain, 1991–2007. *Population Trends, 141*, 13–35.

Philipov, D., Spéder, Z., & Billari, F. C. (2006). Soon, later, or ever? The impact of anomie and social capital on fertility intentions in Bulgaria (2002) and Hungary (2001). *Population Studies, 60*, 289–308.

Puur, A., Oláh, L. S., Tazi-Preve, M. I., & Dorbritz, J. (2008). Men's childbearing desires and views of the male role in Europe at the dawn of the 21st century. *Demographic Research, 19*, 1883–1912.

Quesnel-Vallée, A., & Morgan, S. P. (2004). Missing the target? Correspondence of fertility intentions and behavior in the US. *Population Research and Policy Review, 22*, 497–525.

Régnier-Loilier, A. (2006). Influence of own sibship size on the number of children desired at various times of life: The Case of France. *Population (english edition), 6*, 165–194.

Régnier-Loilier, A., Vignoli, D., & Dutreuilh, C. (2011). Fertility intentions and obstacles to their realization in France and Italy. *Population, 66*, 361–389.

Rost, H. (2005). Kinder – Wunsch und Wirklichkeit. *Zeitschrift für Familienforschung, 17*, 8–20.
Ruckdeschel, K. (2007). Der Kinderwunsch von Kinderlosen. *Zeitschrift für Familienforschung, 19*, 210–230.
Schmid, S., & Kohls, M. (2011). *Generatives Verhalten und Migration – Eine Bestandsaufnahme des generativen Verhaltens von Migrantinnen in Deutschland*. Nürnberg: Bundesamt für Migration und Flüchtlinge.
Schoen, R., Astone, N. M., Kim, Y. J., Nathanson, C. A., & Fields, J. M. (1999). Do fertility intentions affect fertility behavior? *Journal of Marriage and the Family, 61*, 790–799.
Spéder, Z., & Kapitány, B. (2009). How are time-dependent childbearing intentions realized? Realization, postponement, abandonment, bringing forward. *European Journal of Population/ Revue européenne de Démographie, 25*, 503–523.
Spéder, Z., & Kapitány, B. (2015). Influences on the link between fertility intentions and behavioural outcomes. In D. Philipov, A. C. Liefbroer, & J. Klobas (Eds.), *Reproductive decision-making in a macro-micro perspective* (pp. 79–112). Dordrecht: Springer.
Testa, M. R. (2007). Childbearing preferences and family issues in Europe: Evidence from the Eurobarometer 2006 survey. *Vienna Yearbook of Population Research, 5*, 353–377.
Testa, M. R., & Basten, S. (2014). Certainty of meeting fertility intentions declines in Europe during the 'Great Recession'. *Demographic Research, 31*, 687–734.
Thomson, E. (1997). Couple childbearing desires, intentions, and births. *Demography, 34*, 343–354.
Thomson, E. (2001). Family size preferences. In N. J. Smelser & P. B. Baltes (Eds.), *International encyclopedia of the social & behavioral sciences* (pp. 5347–5350). Oxford: Pergamon.
Thomson, E., & Hoem, J. M. (1998). Couple childbearing plans and births in Sweden. *Demography, 35*, 315–322.
Toulemon, L., & Testa, M. R. (2005). Fertility intentions and actual fertility: A complex relationship. *Population and Societies, 415*, 1–4.
Vignoli, D., Rinesi, F., & Mussino, E. (2013). A home to plan the first child? Fertility intentions and housing conditions in Italy. *Population, Space and Place, 19*, 60–71.



# Chapter 12
# Childless at Age 30: A Qualitative Study of the Life Course Plans of Working Women in East and West Germany

**Laura Bernardi and Sylvia Keim**

## 12.1 Introduction

In Germany, the low birth rate and the difficulties women face in reconciling work and family life are frequently discussed by policy-makers. At the heart of the current debate on these issues is the legal entitlement of children under 3 years of age to a place in nursery school, which has been in effect on the national level since August 2013. The qualitative improvement in childcare and the increase in the uptake rate of Elterngeld (parental benefits) for both parents are also high on the political agenda. The aim of these policies is to facilitate the reconciliation of work and family life and the re-entry of mothers into employment as early as possible after childbirth, and thus to make it easier for young adults to pursue an employment career without having to forgo parenthood.

However, the interplay of employment history and fertility behavior, and the ways in which the subjective meanings attached to work trajectories are connected to thoughts and decisions about starting a family, are issues that have so far been little researched (Witzel and Kühn 2001: 56). Relatively few authors have examined the question of whether differences in meanings can explain the differences in

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behavior between young adults in East Germany and their counterparts in West Germany.[1] The work biographies and the family formation patterns of East and West Germans, especially of women, differed considerably. The focus of our analysis is on young women who grew up in the two different systems, and were thus exposed to contrasting family models. How do these differences in upbringing influence the life course plans and arrangements of these women after unification? How do these women envisage combining family formation and employment? Do these women have the same values, norms, attitudes, and behaviors as those of their parents' generation? According to Bourdieu, this legacy of the past could be regarded as an "inertial effect". He stressed that because socialization affects the formation of attitudes and values, as well as the meanings attached to certain behaviors and the range of action, values and behavior may persist after the macro-societal conditions have changed.

Our analysis in this chapter is based on the life stories of young employed women who were socialized in the former East and West Germany, experienced unification as teenagers, and were around age 30 at the time of interview. Over the course of four qualitative case studies we compare East and West German women who are still childless but who want to have children. We examine which family formation pathways these women prefer, the reasons why they have so far remained childless, and their attitudes and perceptions regarding the compatibility of motherhood and paid employment.

In the following section we briefly describe the institutional and demographic peculiarities of the two German states before and after reunification. In the third section we outline the theoretical background of our investigation and introduce our empirical data. In the fourth section we present four case studies of childless women from East and West Germany. In the concluding section we discuss our results and suggest topics for future research.

## 12.2 The Legacy of Different Socio-political Systems: Starting a Family in West and in East Germany

Before German unification, fertility behavior of East and West Germans differed profoundly; thus, we are dealing with two distinct demographic regimes. The term regime implies that these differences in family behavior were shaped by different institutional contexts. One of the most important differences in the realm of family behavior was that the East German government supported maternal full-time employment by providing extensive and easily accessible childcare services.

[1] Andreas Witzel and Thomas Kühn, for instance, examined the life courses of young adults from two regions in West Germany that have different labor market conditions. They found that women, especially after reaching age 30, experience an increased subjective pressure to have children. Career-oriented women "look for solutions which are compatible with family life via 'decelerated' careers" (Witzel and Kühn 2001: 78).

The centrally planned economy guaranteed that both men and women would have reliable and stable employment. Most women had their first child early in their life course, and returned to full-time work after the so-called "Babyjahr". In most cases mothers interrupted their employment for 1 year only. Women seldom had the option of taking a longer break from employment or of shifting to a part-time schedule, and few women spent more than short periods of time as a full-time homemaker (Falk and Schaeper 2001: 188). In contrast, the institutional framework in West Germany supported the model of the married couple with a gendered division of work: i.e. the husband was the principal earner while the wife was a homemaker and mother who was employed part-time or not at all. On average, women in West Germany were considerably older than their counterparts in East Germany at the time of family formation. About 20 % of the women in West Germany remained childless, compared with just 10 % in East Germany (Kreyenfeld and Konietzka, in this volume).

Under the terms of the Unification Treaty, the East German institutional, economic, and political systems were replaced by the West German systems. However, the eastern German Länder remained distinct from West Germany in a number of ways. In particular, in the eastern German Länder childcare services, organized and financed mainly by the municipalities, continued to be widely available (Kreyenfeld 2003; Statistische Ämter des Bundes und der Länder 2015). The annual birth rate fell dramatically in the years immediately after unification (Eberstadt 1994; Witte and Wagner 1995). Although the total fertility rate in East Germany converged with the West German rate after a few years, and even surpassed it slightly since 2008 (Statistisches Bundesamt 2012: 15), some differences between the two parts of the country in the average age at first birth remain. Moreover, women in East Germany are still less likely to be childless than women in West Germany. In addition to being younger when they have their first child, women in East Germany are more likely than women in West Germany to be living in a non-marital partnership at the time of family formation (Kreyenfeld and Konietzka 2010; Huinink et al. 2012; Statistisches Bundesamt 2012). Meanwhile, women in West Germany, who tend to have negative opinions of working mothers, are considerably less likely than women in East Germany to be in full-time employment (Wenzel 2010; Huinink et al. 2012). Given these differences, we conclude that despite the convergence of the political and institutional frameworks of the two parts of the country, two distinct demographic regimes continue to exist. It can, however, also be argued that these differences are merely symptomatic of the critical transitional period, and that behavioral patterns in East and West Germany will eventually converge (Witte and Wagner 1995; Beck-Gernsheim 1997; Kreyenfeld 2004). Yet when and how this assimilation process might occur is currently unclear. The hypothesis of assimilation fails to provide an explanation for the persistent differences in behavioral patterns between the two parts of the country, such as the much higher ratio of unmarried births in East than in West Germany.

In this paper, we contribute to the debate surrounding this ongoing East-West gap in fertility behavior by focusing specifically on the attitudes and life course plans of women who were socialized in the former East and West Germany, and who reached

their teenage years around the time of German unification. How has the experience of being socialized in a particular regime shaped the life course plans of women in the two Germanies? Is there a legacy of the former East German regime that is visible in the attitudes and behavior of young East Germans, similar to an 'inertial effect' of socialization as described by Bourdieu (1984)? Or was German Reunification able to override particular features and attitudes of the "Reunification Cohorts"?

## 12.3 Theoretical and Empirical Background

Based on the concept of habitus, Pierre Bourdieu posited that socialization has an "inertial effect" (1984). Bourdieu used habitus to describe a permanent behavioral disposition that emerges through socialization in a given social environment. By means of his or her habitus, the individual is supposed to incorporate the social norms of the environment, to set his or her preferences, and to act accordingly. It is therefore assumed that the individual's range of action is not restricted by material living conditions alone. Instead, the individual's internalized norms regulate his or her perceptions of which actions are or are not appropriate. It is further assumed that the habitus is very stable, because the individual's perceptual categories and preferences are largely shaped in an unconscious manner through the socialization process.

The concept of ideology developed by Göran Therborn points in the same direction. He emphasized that behavior is limited not just by external circumstances, but also by the imagination of "what exists," "what is good," and "what is possible and impossible" (Therborn 1980: 18); and that multiple ideologies may exist simultaneously within a single culture.

The inertial effect is also conceptualized in the schema theory by Roy D'Andrade. This theory seeks to explain how the socialization process (e.g., acculturation) within a certain social (or cultural) group translates into wishes, motivations, and strategies for action. D'Andrade also stressed the resistance to change: a schema is crystallized in the memory and appears to be prototypical (D'Andrade 1997: 29). Like the concept of habitus, the schema theory posits that the individual perceives socially determined dispositions on an individual basis only. All of these theories assert that the individual behavioral repertoire is restricted by (a) the availability of material resources; as well as by (b) subjective perceptions of possible and appropriate behavior, which originate from the individual's experiences during socialization and in a certain social environment.

The availability of material resources can be analyzed empirically using indicators such as the individuals' socioeconomic characteristics and access to infrastructure. Meanwhile, the complex interaction of consciously chosen and internalized behavior, as described by the term habitus, can be better captured by an interpretative analysis of unstructured interviews in which the individual reconstructs his or her own biographical experiences and makes predictions about his or her future development.

As part of our research project on social influences on family foundation in East and West Germany, we conducted qualitative interviews with more than 100 young women and men in 2004 and 2005. The interviewees grew up in either Lübeck or Rostock, and had either an intermediate or a higher educational degree. We chose these two cities because they are similar in many respects, despite having been subject to two different political regimes for 40 years during the division of Germany. For example, both are port cities in northern Germany that were part of the Hanseatic League. The dominant religion in both cities is Protestant. Moreover, both Lübeck and Rostock have approximately 200,000 inhabitants, and the unemployment rate in both was relatively high during the period of our fieldwork (13.8 % in Lübeck compared to 7.6 % in West Germany; 18.2 % in Rostock compared to 17.7 % in East Germany in 2002). During the interviews, the respondents were encouraged to provide an account of their life up to that point, and to describe their plans for the future. The respondents were also asked systematic questions about the issue of family formation.[2]

Our analyses show that women who live in Rostock and Lübeck have very different ideas about what kinds of employment situations and levels of economic security are prerequisites for having a child (Bernardi et al. 2006). Of particular interest to us in this chapter are the views on starting a family and the reconciliation of work and family life among women who are highly qualified and in full-time employment. We focus on childless women who want to have children.[3] Since socioeconomic characteristics, such as educational level and income, have a considerable influence on both the material resources and the attitudes and perceptions of the individual, we restrict our study to women with similar socioeconomic profiles. Our sample selection allows us to attribute different narrations, especially those related to material life conditions, to different perceptions, attitudes, and values regarding family formation.

## 12.4 Childless Women from East and West Germany: A Comparison

How did these childless women, who were socialized in different fertility regimes and were about to enter their thirties, see their previous life experiences and their future life path? What similarities and differences are revealed in our interviews of women from East and West Germany? Based on our hypothesis of an inertial effect, is it possible to attribute these differences to differences in socialization in East and West Germany?

[2] Detailed information on the selection of the interviewees and the data collection method can be found in Bernardi et al. (2014).

[3] Only a few of our interviewees said that they definitely do not want to have children. We conducted a separate analysis of these interviewees, and therefore excluded them from this essay.

To allow us to focus on narrations of a complete life path, instead of on fragmented aspects of each story, we confine our investigation to four case studies: two women from Rostock and two women from Lübeck, who are similar in many ways. This approach helps to ensure that the differences in views on family formation are not primarily attributable to differences in living conditions. The first two women we compare both had a safe employment situation and moderate career ambitions. At the time the interview was conducted neither of the women was in a relationship suitable for starting a family (the interviewee from Lübeck was single while the respondent from Rostock was in a relationship which she considered unstable). The other two women we compared were similar in terms of their mobility experiences and career ambitions. At the time of the interview they had been in the same partnership for multiple years and wanted to have children with their partner. Thus, while each woman has her own story, our case studies exemplify the main differences between all of the interviewees from Lübeck and Rostock.

### *12.4.1 Antje from Rostock: Refusal to Engage in Family Planning: "I Hate Planning"*

Antje is 29 years old. She grew up in Rostock, and graduated from high school and university in the city. She would have preferred to have stayed there, but—like many other women her age—she moved to nearby West Germany 5 years previously to take a job. When her first employer went bankrupt 2 years later, she looked for and easily found a new job. She is currently employed full-time and has a high disposable income. Although she does not consider her work to be exciting ("a lot of paperwork"), she describes her job as safe and her salary as appropriate. While she sometimes looks half-heartedly for another job, she expects to stay where she is for at least the next few years:

> "It's a rather safe place, but I do not really want to say that I want to grow old there. I feel I am still too young to stay in such an administrative position for years."

Antje has been in a relationship for 3 years, but does not live with her partner, although he would like to cohabit. She describes her relationship as a "pending action" and is not certain how it will develop:

> "I do not really have a plan, I honestly have to say. Maybe it's because the relationship is not that good at the moment, or maybe I simply have a little tick, that I don't want this [moving in together]. On the other hand I kind of like it this way [as it is]."

Antje states that having her own family will become an issue "certainly at some point in time," but not at the moment: "I am only 29 years old." Yet, she reports having an increased interest in children:

> "I find children very, very beautiful (…) maybe it's my hormones; one likes to look [at little children]. Don't ask why, it's like that."

She takes it for granted that she will continue to work after becoming a mother. She complains about the poor "childcare in the West," and hopes that in the future companies will do more to help women balance work and family life. Antje's image of a family coincides with the traditional family model in the former East Germany, which featured a full-time working mother. Antje's demand for adequate public childcare and for more family-friendly company policies also draw on this family model.

Throughout her narration, Antje refuses to make long-term plans. This systematic rejection of planning for the future is evident in almost all parts of the interview in which she talks about her work life or her partnership:

> "For the love of God, I hate planning. I would start panicking if things did not work out accordingly [laughs]. (…) Well, because then the people, if they plan, obviously also become frustrated eventually, if it doesn't happen the way they hoped. And then the life crises start [laughs]."

Even when asked about a possible timeframe for starting a family, she refuses to make any specific plans:

> "I don't want to somehow choose a time now, but I also don't want to be an old maid."

Although she wants to have a child, Antje cites her age as the main reason for her childlessness, as she believes she can wait a few years before having a child. However, the instability of her partnership also seems to play a role in her indecision, as the following quote illustrates:

> "I think if the circumstances were right, maybe I wouldn't plan things that precisely. But at the moment, I wouldn't like to have it [the child] by myself right now. (…) The partner should be right at least, I don't just need some sperm donor (…) and I also think that one should also live together. Yes, I think the relationship should be in place."

According to Antje, the "right circumstances" for motherhood include being in a harmonious partnership: if she had a suitable partner, she would not need to have a precise plan for starting a family. It is clear that she does not consider her current partner to be the "right" one. She does not, however, explain what bothers her about her current partner, or describe what qualities a suitable partner would have. She mentions her job as being another factor in her decision about when to start a family:

> "In my current job, I think I could take a break at any point for a certain period of time and then go back. I wouldn't worry too much about that."

Since her current job allows her to take parental leave and come back afterwards, the criterion of having a job suitable for starting a family has already been met. Thus, for Antje the issue of how to reconcile work and family life has been resolved.

As a counterpart to Antje's story, we now look at the story of a young woman from Lübeck. She has a very different image of the family, and describes a precise set of conditions under which she hopes to start a family.

### *12.4.2 Miriam from Lübeck: Family Planning Based on the Main Breadwinner Model: "I Envision it Like This, That I Will Definitely Stay Home"*

Miriam is single, 30 years old, and has an open-ended full-time job. Although she is proud of her occupational achievements, she ascribes them more to coincidence or to external pressure than to her own efforts. She sees herself as lazy, and is not interested in any career objectives. She has considered continuing her education, but has repeatedly postponed doing so because she believes it would be too arduous. She is very happy with her current job, and has become friends with her boss and some of her colleagues. She currently views her job as relatively safe, but given the high rate of unemployment in Lübeck, she is aware that this can change quite quickly.

Miriam has wanted to have children for some time, and the main topic in this interview is her lack of a partner with whom she can start a family. When she talks about family, Miriam has the traditional West German family model in mind: the woman is a full-time homemaker or works part-time, while the husband is the main breadwinner.

> "If everything is great and all of the preconditions are met, I actually envision that I will definitely stay home and play mom as long as I feel like it. And then I can go back to work. I don't think that these three years are enough for me. I think I could even go longer."

This plan seems to reflect the experiences of her own mother, who raised four children while her husband worked, and did not have a job until the youngest child became a teenager. Miriam believes that taking care of children is the responsibility of the mother. She rejects the idea of involving her male partner in childcare (e.g., paternity leave) or putting her children in day-care:

> "If I actually give birth to a child, I would also like to enjoy it somehow."

Since having a secure financial foundation is very important for Miriam, she wants her partner to have a salary that is large enough to allow her to stay home:

> "By all means, if I actually plan this, if I plan to have children, then I absolutely would like to be financially secure so that I don't have to sacrifice so much."

Here it becomes evident that she would like to have a firm foundation before starting a family. Her planning also extends to the life of her partner: he is supposed to have career ambitions as well as a job (or the prospect of a job) which provides financial security and a good income. Her former partners were not suitable because they were not sufficiently career-oriented, they did not want to have children, or they did not want to take on the role of the main breadwinner:

> "I would have provided him with all the opportunities; we could have moved into a smaller apartment so he could study. But he didn't want to. (…) I have always, well we have also spoken about it, what we would do if we had children now, how would we finance this. I would have had to have gone back to work immediately. (…) That was another thing which bothered me, because it was never clear what happens then. (…) And yes, at this age, at 30,

> one starts to think. I thought about whether I really wanted to have a family, children with him. Nah! I didn't."

As she wants to have children, Miriam attributes her childlessness to the lack of the right partner. Her goal is to find a partner who shares her views concerning role allocation within the family and the preconditions for starting a family, and who is able to provide the desired financial security.

The case studies of Antje and Miriam illustrate that the family models that were dominant in the former East and West Germany persist after unification, and that views on long-term life course planning can differ considerably in the two parts of the country. The following two case studies of women who have been living in a partnership for years are similar to the first two case studies. They also show that women in the East and the West differ in their views on family models and long-term family planning. Both women are highly qualified university graduates with excellent career prospects. Now they are facing the issue of how to reconcile work and family life.

### *12.4.3 Kristin from Rostock: Egalitarian Gender Roles and the Impossibility of Reconciling Work and Family Life: "A Great Job and Family—How is that Supposed to Work Out?"*

Kristin is 29 years old and grew up in Rostock. After graduating from high school she moved several times. First she moved to another town in East Germany to attend university, and then to a town in West Germany to attend a different university. After graduating from university she moved to yet another town to enroll in a doctoral program. She got a full-time job a few months previously, and again lives in a town in East Germany. She has been in a partnership for 7 years. She and her partner have lived together for certain periods of time, while in other periods they have had a long-distance relationship and saw each other only on the weekends. They have been living together for 9 months now:

> "I have reached the point at which we have been living together for a longer period of time than we commuted, if I don't move again [laughs]."

The main issue she raises in her interview is the difficulties she faces in combining the demands of her career, including the need to move frequently, with her desire to live with her partner:

> "On the one hand I would like to have a great job, on the other hand I want to live together."

She is always forced to make compromises. Although she lives with her partner, her workplace is relatively far (70 km) from their home, and she is not completely satisfied with her job:

> "It was clear to me beforehand that this isn't my dream job, but rather an attempt to somehow reconcile everything (…) Since we are living together at the moment, I am sticking with it for now. On the other hand if the job becomes very frustrating, at some point I will start thinking about living apart again."

As she has so far failed to find a way to combine living with her partner with having the right job, starting a family seems even less possible to her:

> "And if one wants to have something like a family, [should the parents then] travel? How is this supposed to work? Should the parents decide to live alone as 'voluntarily single parents'? (…) I find this very, I can't, well I find this very, very difficult at the moment. (…) We actually want to have children. (…) And a relationship based on traveling, like I said: who takes the children? Me or you or maybe in the middle? How does one organize something like this?"

Like Antje from Rostock, Kristin takes for granted that she will continue to work and pursue her professional ambitions after becoming a mother. And like Antje, she does not want to have to plan to start a family, and lacks precise ideas about how and when to have a child. While she recognizes that the amount of time she has to become pregnant is limited, this thought does not inspire her to engage in more precise planning:

> "So far I have always felt young enough, that the edge is still far away."

The young woman from Lübeck we will introduce in the following case study has also faced challenges in reconciling her career ambitions and her desire to become a parent. However, unlike Kristin, she has developed a plan which incorporates the typical family model in West Germany.

### *12.4.4 Karen from Lübeck: Planning a Family with a Gender-Related Role Allocation: "It Will be One of Those Modern Relationships, Where the Husband Works Somewhere else During the Week and Comes Home Over the Weekend"*

Karen is 30 years old and lives in a town in West Germany not far from Lübeck. She has been with her partner for 7 years, and after years of seeing each other only on the weekends they have been living together for the past 3 years. At the time the interview took place she was certain that he was going to take up a new post soon, and that they would again see each other only on the weekends.

After graduating from high school Karen attended a business school in Lübeck. She then attended university in another town in West Germany. As she was unable to choose a single field of study, she pursued multiple fields. With such broad qualifications it was easy for her to find a job after she had completed her studies. Although this job was not well paid, it offered her the opportunity for further training over several years, and was a very good career move. Nevertheless, she left the job after 3 months:

> "I did it for three months, and enjoyed it (…) but then I thought, nah, this way is somehow too long for me, again three, four years of further training, so little money the whole time (…) it was just such a long way, and slowly but surely the idea emerged that I want a family at some point. If I take this long before I can even start, then I am eventually 35 and then I want children, then I finally want to start having children."

Karen then found another temporary job which promised to advance her career. However, she left this position as well after a short time as it seemed to be incompatible with her desire to have a child in the near future. She now has an open-ended job which does not offer great career opportunities, but which provides the perfect conditions for having a child:

> "One reason I took this job was because it was open-ended, which means I have a certain security and can switch to part-time anytime I want, and that I am staying here [in the town where I currently live], so the next thing in line is having children, planning a family. And I can foresee doing this within the next year, somehow. The next deadline—because it didn't work out by 29—is now to have the first child by 32 at the latest."

This ideal of working part-time (if at all) after becoming a mother is in line with the traditional family model in West Germany. Karen, like Miriam from Lübeck, has a precise plan for becoming a parent, and has already put a great deal of effort into pursuing this objective. She has adhered to her plan of finishing her studies, then securing the right job, and then becoming a parent. This applies to her partner as well. From his interview we know that initially he did not want to start a family, and did not plan his career with the goal of supporting a family. He gradually changed his attitude, in part because he was persuaded by his girlfriend. He made job-related changes to ensure that he could fulfill his role as the breadwinner of the family. He reports:

> "It is really like this, that I was at least implicitly as well as explicitly raised to believe that the most important goal is to have a job and to have money. And actually I was opposed to this view in the 90s; previously I was afraid that I would become unemployed, because in school I was interested in subjects like history, which are not really relevant for work…I have always been a potential candidate for unemployment. And this has indeed left a mark on me, so I went back and forth [from fear of unemployment to opposing a well-paid and secure but boring job]."

After completing vocational training, he did not work in his profession, but became a freelance artist:

> "And then it was actually important to me to live as an artist, well to get around a lot, but I haven't thought that I could support a family, because it was obvious that I can only take care of myself then. But this has changed now, since I got together with Karen. Yes at first I was still a bit uncertain, but since I got together with Karen the model of having a family is there for me. That means responsibility for others, that also means that money has to be earned. (…) Now it is more important for me that I also earn money and that I am taken up on my duties as a father. This is my perspective, especially now. That is also the most important to me. We want to start a family, and that is great."

This interview excerpt shows how Karen's partner came to accept the expectation that he would take on the role of the main breadwinner when he became a father, even though he had rejected the role for years after having grown up with it. He now

believes that he has found an opportunity to combine his desire to have an interesting and varied job with his role as the family breadwinner by pursuing a career as a scientist. Under the couple's long-term plan, Karen and the child will live in Lübeck or in the town where they are currently living, while her partner will live elsewhere during the week in order to pursue his career. At the center of the plan is the mother-child-home unit, which will remain in one place. Karen refers to it as "the principal life residence." In contrast to Kristin from Rostock, Karen is not worried at the prospect of being a single mother during the week.

Karen has already talked to her parents and friends about her plans for having a family, and knows that she will be supported by them. In addition, the career and stable income of her husband are more important to her than being able to live with him. Using this approach, she expects to succeed in combining the traditional West German family model with the flexibility and mobility currently demanded in the labor market. Unlike Kristin from Rostock, who has been unable to find a way to follow the egalitarian family model by pursuing a career in science while being a parent, Karen has found a solution by modifying the traditional West German family model. She is willing to give up her own career and living with her partner, and has asked her husband to focus on his career instead. Her husband's willingness to sacrifice spending time with his children in order to pursue his career and fulfill his role as the family's breadwinner is also in line with this model.

## 12.5 Shared Living Conditions: Differing Conceptions and Behavioral Patterns

The women from East and West Germany who were interviewed in this study were similar in terms of their initial positions and their current material living conditions: they described having difficulties related to their uncertain employment situations, including having to take temporary jobs and make frequent moves. The women also complained of challenges in figuring out how to reconcile having a family life with having an active and satisfactory work life. Nonetheless, we found that the women in the East and the West had very different ideas and behavioral patterns which, given these living conditions, could lead to childlessness.

Our comparison of four individual case studies sheds light on some behavioral patterns that have emerged from the different socialization contexts that prevailed in Germany prior to unification. In particular, we have been able to illustrate that the family models that were dominant in the former East and West Germany were still very present in the narrations of the women interviewed. While the East German women assumed that both parents would have a job, their West German counterparts assumed that there would be an asymmetric role allocation: i.e., that the man would be the main breadwinner and the woman would be primarily responsible for homemaking. It is thus apparent that women from East Germany see work and family life as being two parallel tracks, neither of which should have priority. There was

no indication that they had even considered following the West German family model.

Given the current levels of economic uncertainty and the labor market demands that workers remain flexible as well as mobile, the East German family model has the potential to result in childlessness, as it is difficult to ensure under these conditions that both partners will be able to reconcile their work life with parenthood. Yet the West German model, in which the man's job is the sole focus, could also lead to childlessness if the male partner is unable to be the main breadwinner due to adverse labor market conditions. Thus, the East German egalitarian model seems to be more advantageous because both partners are contributing to the family income.

Another difference between the interviewees from East and West Germany was the degree to which they had planned how they would start their family. The West German women developed clear ideas about how they would like to reconcile work and family life, and about the role their partner was supposed to play. The East German women, by contrast, considered having a family to be a project that was independent of their work life, and did not develop any special plans regarding their own career or their partner's choice of profession or career (as was the case with Miriam and Karen from Lübeck). In line with the habitus concept, we reason that this difference may be traced back to the fact that women in the GDR did not have to engage in long-term planning to advance their own career and to ensure that they could reconcile employment and family life. The young women from Rostock lacked the experience of normative pressure, including the example of the preceding generation, which may have otherwise led them to formulate long-term plans even before they were ready to have children (Antje). Thus, they were not prepared to address the issue of how to reconcile work and family life when they were ready to start a family (Kristin). It is also conceivable that the absence of long-term planning was a response to unification and its consequences, as this event was both unexpected and uncontrollable for the individual. The fundamental social changes induced by unification shook up the current lives of many East Germans, as well as their expectations concerning their future lives. Having witnessed how quickly biographical continuity can be destroyed may have led them to avoid making long-term plans. Given the ongoing labor market uncertainties in Germany and the increasing demands for individual flexibility and mobility, following a long-term plan may seem difficult. Overly rigid biographical plans—e.g., setting subjective preconditions which must be fulfilled prior to family formation—may cause women to postpone parenthood, and to end up childless. However, an absence of long-term planning can also hamper the spontaneous realization of parenthood. By hoping the circumstances will be better at some point in the future, starting a family may be perpetually delayed.

These results confirm our hypothesis that an inertial effect of socialization under different political regimes is having long-term effects on the life paths of the generation under study. Although their current life conditions are similar, their different socialization contexts lead women to cope with these conditions differently. To gain a better understanding of different paths to childlessness, we therefore have to take into account the different perspectives and behavioral patterns that have persisted in East and West Germany even after unification. The interesting question which fol-

lows from these observations is how durable this inertial effect is likely to be. Will we see fundamental changes in the cohort who are currently thinking about family formation, and who have been raised in unified Germany? Or will the inertial effect linger until the following generation—i.e., the young adults whose parents have not experienced a divided Germany—start having children? These are interesting issues for future research.

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## References

Beck-Gernsheim, E. (1997). Geburtenrückgang und Kinderwunsch—die Erfahrung in Ostdeutschland. *Zeitschrift für Bevölkerungswissenschaft, 22*, 59–71.

Bernardi, L., von der Lippe, H., Klärner, A. (2006). *Perceptions of job (in)stability and parenthood perspectives. Case studies in eastern and western Germany*. Paper presented at the Population Association of America 2006 Meeting.

Bernardi, L., Keim, S., & Klärner, A. (2014). Social networks, social influence, and fertility in Germany: Challenges and benefits of applying a parallel mixed methods design. In S. Domínguez & B. Hollstein (Eds.), *Mixed-methods social networks research. Design and applications* (pp. 121–152). Cambridge: Cambridge University Press.

Bourdieu, P. (1984). *Distinction. A social critique of the judgement of taste*. Cambridge, MA: Harvard University Press.

D'Andrade, R. (1997). Schemas and motivation. In R. D'Andrade & C. Strauss (Eds.), *Human motives and cultural models* (pp. 23–44). Cambridge: Cambridge University Press.

Eberstadt, N. (1994). Demographic shocks after communism: Eastern Germany, 1989–1993. *Population and Development Review, 20*, 137–152.

Falk, S., & Schaeper, H. (2001). Erwerbsverläufe von ost- und westdeutschen Müttern im Vergleich: ein Land—ein Muster? In C. Born & H. Krüger (Eds.), *Individualisierung und Verflechtung. Geschlecht und Generation im deutschen Lebenslaufregime* (pp. 181–210). Weinheim/München: Juventa.

Huinink, J., Kreyenfeld, M., & Trappe, H. (2012). Familie und Partnerschaft in Ost- und Westdeutschland. Eine Bilanz. In J. Huinink, M. Kreyenfeld, & H. Trappe (Eds.), *Familie und Partnerschaft in Ost- und Westdeutschland. Ähnlich und doch immer noch anders* (pp. 9–28). Opladen: Budrich.

Kreyenfeld, M. (2003). Crisis or adaptation—reconsidered: A comparison of East and West German fertility patterns in the first six years after the "Wende". *European Journal of Population, 19*, 303–329.

Kreyenfeld, M. (2004). Fertility in the FRG and GDR. *Demographic Research, Special Collection, 3*, 67–318. http://www.demographic-research.org.

Kreyenfeld, M., & Konietzka, D. (2010). Nichteheliche Geburten. In J. Goldstein, M. Kreyenfeld, J. Huinink, D. Konietzka, & H. Trappe (Eds.), *Familie und Partnerschaft in Ost- und Westdeutschland* (pp. 8–9). Rostock: Max-Planck-Institut für demografische Forschung.

Statistische Ämter des Bundes und der Länder (Federal Statistical Office and the statistical offices of the Länder). (2015). Kindertagesbetreuung regional 2014. Ein Vergleich aller 402 Kreise in Deutschland. Wiesbaden.

Statistisches Bundesamt (Federal Statistical Office). (2012). *Geburten in Deutschland. Ausgabe 2012. Wiesbaden*. https://www.destatis.de/DE/Publikationen/Thematisch/Bevoelkerung/BevoelkerungsbewegungBroschuereGeburtenDeutschland0120007129004.pdf.

Therborn, G. (1980). *The ideology of power and the power of ideology*. London: Verso.

Wenzel, S. (2010). Konvergenz oder Divergenz? Einstellungen zur Erwerbstätigkeit von Müttern in Ost- und Westdeutschland. *Gender, 2*, 59–76.

Witte, J. C., & Wagner, G. G. (1995). Declining fertility in East Germany after unification: A demographic response to socioeconomic change. *Population and Development Review, 21*, 38–48.

Witzel, A., & Kühn, T. (2001). Biographiemanagement und Planungschaos. Arbeitsmarktplatzierung und Familiengründung bei jungen Erwachsenen. In C. Born & H. Krüger (Eds.), *Individualisierung und Verflechtung. Geschlecht und Generation im deutschen Lebenslaufregime* (pp. 55–82). Weinheim/München: Juventa.



# Chapter 13
# Assisted Reproductive Technologies in Germany: A Review of the Current Situation

**Heike Trappe**

## 13.1 Introduction

As assisted reproductive technologies have become increasingly prevalent, and the issues surrounding the use of ART are discussed in the public media, a sweeping social change with ethical, cultural, and demographic consequences has been set in motion. According to some commentators, the decoupling of procreation and pregnancy seems to have suspended the "fundamental law of human reproduction" (Bahnsen and Spiewak 2008: 35). Other observers have noted that fertility treatments have created the illusion of extended fecundity through the partial transcendence of the limitations set by nature (Correll 2010: 36).

The first "test tube baby" was Louise Joy Brown, born in England on 25 July 1978. Her birth represents the cornerstone in the development of assisted reproduction[1] (Steptoe and Edwards 1978). The first "IVF baby" in Germany was born at the university hospital in Erlangen in spring of 1982 (Berlin-Institut für Bevölkerung und Entwicklung 2007: 23). In 2010, Robert Edwards, a co-founder of the first in vitro fertilisation (IVF) programme, was awarded the Nobel Prize in Physiology or Medicine. Thus, reproductive medicine, a subfield of medicine which deals with human reproduction and its dysfunctions, is still quite young. Reproductive technologies have, however, been developing rapidly, and social acceptance of fertility treatments has been growing. Worldwide, more than four million individuals have

This contribution is a partly updated and reworked version of the article by Trappe (2015).

[1] The terms assisted reproduction and reproductive medicine are being used interchangeably in this chapter.

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been conceived through the use of ART (Beier et al. 2012). Since the systematic registration of ART began in Germany in 1997, there have been around 202,000 live births to parents who used these technologies – a figure which approximates the number of inhabitants of medium-sized German cities like Kassel or Rostock (Deutsches IVF-Register (DIR) 2014: 261).

Physicians of reproductive medicine in Germany seek to support both women and men, most of whom are in heterosexual partnerships, in fulfilling their desire to have a child. Freedom of reproduction is seen as a fundamental human right. Fertility treatment is usually preceded by the diagnosis of one or more biologically caused fertility limitations. In diagnosing these limitations, the physician distinguishes between sterility and infertility in both the male and the female partner. Infertility is defined as the inability to carry a pregnancy to term and to deliver a live birth, whereas sterility indicates the inability to conceive or to father a child. Most of the couples who undergo fertility treatment are not absolutely sterile, but have an unspecified restriction of fertility (Ludwig et al. 2013: 2). As a rule, subfertility is assumed after at least 1 year of regular sexual intercourse without contraception within which no pregnancy has been achieved (Beier et al. 2012). Since 1967 the World Health Organisation (WHO) has classified permanent involuntary childlessness as an illness with potentially severe psychological consequences (Robert Koch-Institut 2004). The extent of involuntary childlessness is difficult to estimate because of its age dependence, and because of the lack of clear boundaries between voluntary and involuntary childlessness (Kreyenfeld and Konietzka 2013: 18; Sobotka in this volume). Existing data tend to underestimate the extent of biologically based childlessness because it is assumed that an appropriate diagnosis has been confirmed.

## 13.2 Legal Framework and Rules for the Assumption of Costs for ART

The Embryo Protection Act (ESchG), which went into effect in Germany in 1991, established the legal framework for providers of reproductive medicine (Diedrich 2008). The main purpose of the legislation was to ensure the preservation of the embryo, and to mandate penalties for noncompliance.[2] ESchG also stipulated that ART should be used to optimise the success of a pregnancy, and not for other purposes. “The core rule related to the realisation of these goals is the so-called ‘rule of three’: physicians are only allowed to fertilise the egg cells which will be transferred within a single treatment cycle, and the number of embryos which may be transferred in each cycle is limited to three” (Riedel 2008a: 11 – own translation). ESchG lists a number of misuses of ART, including egg cell donation (i.e., the

[2] An embryo is defined as “fertilized human egg capable of developing from the time of fusion of the two nuclei, and each totipotent cell removed from an embryo that is capable of dividing or developing into an individual human being if the necessary conditions prevail” (ESchG § 8 (1)).

transfer of an unfertilised egg cell from one woman to another), surrogate motherhood, and the utilisation of egg or sperm cells after the death of the owner. The only major fertility treatments not mentioned in the legislation are the donation of sperm cells (Berlin-Institut für Bevölkerung und Entwicklung 2007: 33) and the donation of "surplus" embryos (Ahr and Hawranek 2014) unless the ART treatment had been undertaken with the purpose to donate embryos (Möller 2013: 588).

Since the ESchG first went into effect, researchers in Germany have been calling for the passage of a comprehensive law which regulates all aspects of assisted human reproduction (Diedrich and Griesinger 2006; Riedel 2008b; DIR 2014). So far, these efforts have been unsuccessful (Riedel 2008a), most likely because the proposal of new legislation would incite another round of public debate on the status of embryos and the beginning of human life (Spiewak 2009). On the one hand, the fact that assisted reproduction in Germany is only partially regulated implies that there are no clear instructions to providers on how to manage some important aspects of ART, such as the handling of "supernumerary" embryos.[3] On the other hand, a large number of directives and laws have been approved which regulate certain aspects of reproductive medicine. For instance, the standards of quality and safety for egg cells, sperm cells, oocytes, and embryos were established in the Tissue Act of 20 July 2007. The Stem Cell Act of 28 June 2002, which outlined the conditions for the import of and research on embryonic stem cells, mandated a high level of protection for human gametes. Meanwhile, German physicians of reproductive medicine have argued that, because of legal restrictions, the types of treatment they can offer their patients are not keeping up with the most recent developments in medical science and technology. For example, physicians have asserted that the prohibition on embryo selection, and thus of the elective transfer of a single embryo, often results in unwanted multiple pregnancies (Beier et al. 2012: 364).

As was noted above, the donation of sperm cells, including the use of sperm cells which do not come from the female patient's male partner (heterologous or third party donation), is generally allowed in Germany. The only requirement for using donated sperm is a written declaration of consent by the future parents and the sperm donor. While the use of anonymous sperm or a mixture of sperm cells from different donors is not punishable by law, many people believe it is immoral because it violates a child's right to know her or his genetic ancestry (Revermann and Hüsing 2010: 199). To date, a sperm donor in Germany is not fully protected from legal claims that he is obliged to provide financial and other forms of support for any children who are conceived from his donation (Beier et al. 2012: 365). Two other laws are relevant in this context: the Transplantation Law of 2007 and the Children's Rights Improvement Act of 2002. "The former law prescribes that all documents in relation to human tissue have to be stored for at least 30 years … The second law stipulates that paternity cannot be contested by the male partner or the mother if they have agreed to artificial insemination by a third party donor, but only by the child after she or he reaches the age of majority" (Wischmann 2012: 121 – own

[3] These are embryos which were produced through IVF and which were left over after the treatment had been finished (Riedel 2008a).

translation). This gives children conceived by third party sperm donation the option as adults to gain access to the data of the former donor, and thus to acquire full knowledge of their ancestry.

According to guidelines which are binding on all medical professionals, access to ART services is granted to all married couples, but it is granted to cohabiting heterosexual couples only under exceptional circumstances (No. 3.1.1. of the Guideline of the Medical Chamber, Bundesärztekammer 2006). The reasoning for this restriction is that a child's welfare is best ensured within the legal bonds of matrimony. Some observers have called this restriction an example of the "power of the norm of heterosexual families with biological children" (Correll 2010: 36), while others have claimed it represents unconstitutional discrimination of same-sex couples and single women (Revermann and Hüsing 2010: 200; Möller 2013: 595).

The reasoning for the controversial prohibition of egg cell donation is to avoid ambiguity about who the mother is, and to prevent a separation of the genetic and gestational components which might result in identity problems for the child. The differences in the regulation of egg cell and sperm donation have been justified by the different "depths" involved in collecting male and female gametes (Revermann and Hüsing 2010: 200). From a social science perspective, it is relevant that ambiguity about the identity of the father of a child has long been tolerated, whereas uncertainty about the identity of a child's mother has not. Meanwhile, reproductive medical professionals have been calling for a reasonable policy on egg cell donation in Germany to support the 3–4 % of women under age 40 who are unable to conceive for genetic or other reasons (Kentenich and Griesinger 2013: 273).

The diagnostic options related to ART are also regulated under ESchG and subsequent interpretations of the law. For example, polar body diagnosis, elective single embryo transfer (eSET), and pre-implantation diagnostics (PID) are legally permitted in Germany, but only within strict limits. These procedures and the legal framework surrounding them cannot be described in detail here (see Revermann and Hüsing 2010; Beier et al. 2012). The law on PID (PräimpG) went into effect on 21 November 2011, but the corresponding by-laws with important details (PIDV) did not become effective until February 2014. A PID procedure in connection with IVF is permitted only in specially authorised centres, and only after the couple have filed an application which has been approved by an interdisciplinary ethics panel. To qualify for a PID procedure, the couple must be able to show that they carry a serious genetic disease, or that the woman is likely to die or miscarry if she becomes pregnant (PräimpG § 3a(2) and PIDV).

"The reimbursement of the costs associated with ART varies between private and statutory health insurance. Overall, there are tendencies to limit reimbursement or to deny it" (Revermann and Hüsing 2010: 209 – own translation). "Until December 2003, up to four treatment cycles were fully covered by statutory health insurance. Since January 2004, the law for the modernisation of statutory health insurance (GMG) applies. Since then only 50 % of the treatment costs for a maximum of three

treatment cycles are reimbursed.[4] For couples to qualify for coverage they must be married; women must be between 25 and 40 years of age and men must be between 25 and 50 years of age" (Passet-Wittig et al. 2014: 6). Before the treatment starts, couples have to undergo mandatory counselling on the medical and psycho-social aspects of ART with a physician who does not provide the treatment. For the relatively small share of women and men with private health insurance, the situation is somewhat different. Generally, private insurance provides full coverage for three treatment cycles based on the costs-by-cause principle, which implies that in a couple the insurance of the person who is considered "responsible" for the fertility problems has to cover the full costs (Revermann and Hüsing 2010).

"Since the implementation of the GMG, some statutory health insurance providers have individually increased coverage of fertility treatments for their customers" (Passet-Wittig et al. 2014: 7). A few selected federal states, like Saxony, Saxony-Anhalt, Lower Saxony, Mecklenburg-Western Pomerania, and Thuringia, support state residents who seek fertility treatments by limiting their co-payment to 25 % (Passet-Wittig et al. 2014). This means that a couple's statutory health insurance provider and their place of residence have become significant factors in the size of their ART co-payments. The reduction in reimbursement by the GMG has had severe consequences for the great majority of couples with fertility problems.[5] The number of fertility treatments fell sharply after the passage of the law, and is only slowly returning to previous levels (DIR 2014, see section 13.3.5). In the political realm, the public financing of ART treatments is a matter of dispute. Proponents argue that permanent involuntary childlessness is an illness, and point to the tenuous demographic situation in Germany. Critics question the assertion that fertility problems are an illness, and argue that the fulfilment of the desire to have children should not be considered a form of social security. Rauprich (2008: 46) offered a further perspective on public financing of fertility interventions, asserting that having a child is a fundamental need, and that the question of how to pay for these treatments is one of equality of opportunity.

Across Europe, the financing mechanisms for ART vary greatly. While the costs associated with fertility treatments are fully covered by insurance in some countries (e.g., Spain), couples must bear the full costs themselves in others (e.g., Switzerland). The legal framework and the regulation of the criteria for access also vary considerably across Europe (Rauprich 2008; Revermann and Hüsing 2010; Küpker 2013). In Germany, some couples choose to pay for the fertility treatments themselves or to seek treatment abroad, presumably because of the legal restrictions in Germany and the challenges they face in gaining timely access to treatment. According to one

[4] A constitutional complaint about the reduction in reimbursement was rejected by the Federal Constitutional Court (Bundesverfassungsgericht 2009).

[5] "The costs associated with fertility treatments are considerable. In Germany, the cost of a standard IVF cycle including medication is about 3000 euros. An intracytoplasmatic sperm injection (ICSI), which is necessary in cases of male subfertility, costs about 3600 Euro. The rate of success varies according to the age of the woman and other factors … Based on this, a rough estimate of the cost of a live birth is about 15,000 euro" (Rauprich 2008: 32).

estimate, around 1000 German couples each year engage in "fertility tourism" in countries with less restrictive fertility treatment regulations (such as Belgium, the Czech Republic, and Spain) or with lower costs for ART (such as Hungary and Slovenia) (Revermann and Hüsing 2010: 221).[6]

## 13.3 Assisted Reproductive Technologies (ART)

In this section, I provide brief descriptions of the medical procedures and technologies which are currently being used to help couples with fertility problems fulfil their desire to have a child. While these descriptions do not include medical details, they should make it easier to understand the temporal developments in their use, and the extent to which these procedures have been successful in Germany (see section 13.3.5).

### *13.3.1 Intrauterine Insemination (IUI)*

After the timing of a woman's ovulation is determined through regular ultrasound monitoring, a "washed" sperm sample is placed directly inside the woman's uterus using a sterile soft catheter. This procedure considerably shortens the distance the sperm must normally travel; i.e., from the vagina through the cervix and the uterus and into the fallopian tube. IUI can be performed with or without hormonal stimulation to trigger ovulation. As this treatment usually does not cause any pain, it can be performed without the use of anaesthesia (Wischmann 2012: 75). As the fertilisation takes place within the woman's body, it is a relatively simple form of ART. IUI has a long tradition (Dorn 2013), and has been practiced for a much longer period of time than the more extensive procedures that involve an extracorporeal fertilisation.

### *13.3.2 In Vitro Fertilisation (IVF)*

IVF is the joining of an egg and sperm outside of the woman's body. The actual fertilisation and the initial process of cell division take place in vitro in a nutrient liquid. This eliminates the need for the embryo to pass through the fallopian tube. IVF is the most basic form of all of the extracorporeal ART procedures, which can be understood as being special cases of IVF. "IVF can be described as follows: After

[6] Other sources cite much higher numbers (Spiewak 2011). An ethnographic study by Bergmann (2011) provides insights into the complex motivations for fertility tourism to Spain, Denmark, and the Czech Republic.

a hormonal stimulation to trigger a woman's ovulation, multiple eggs are retrieved using a transvaginal technique. In the laboratory, the identified and prepared eggs are incubated together with the washed sperm. After successful fertilisation, the resulting embryos are cultivated and transferred to the patient's uterus" (Revermann and Hüsing 2010: 37 – own translation). It is important to note that the retrieval of mature follicles is done under conscious sedation or general anaesthesia, which has certain risks. In most cases, 6–10 eggs are removed from the woman at once, and the man's semen is collected, prepared, and washed on the same day. To initiate the fertilisation, the egg and the sperm are incubated together, and the embryos are cultivated for about 2 days in an incubator. This process is monitored microscopically, and the quality of the embryos is judged according to morphological criteria.[7] No later than 5 or 6 days after fertilisation a maximum of three promising embryos are transferred into the woman's uterus, in line with the rules set out in ESchG. Any "leftover" fertilised eggs which are at the stage prior to the fusion of the two nuclei (2-PN stage) are often cryopreserved in liquid nitrogen (Revermann and Hüsing 2010: 37). Interestingly, over time there has been an extension in the duration of the period prior to the transfer of the embryo. The purpose of this "German compromise", which is based on a liberal interpretation of the ESchG, is to limit the number of transferred embryos to a maximum of two, while still achieving pregnancy rates comparable to those in other countries (DIR 2011).[8] The decision about whether to use an IVF procedure often depends on the quality of the man's sperm and medical indications of the woman.

### *13.3.3 Intracytoplasmic Sperm Injection (ICSI)*

The intracytoplasmic sperm injection procedure was first developed in the early 1990s. The only difference between ICSI and conventional IVF is the fertilisation itself. This technique involves the insemination of a mature egg cell by the microinjection of a single sperm cell into it. The steps before and after insemination are exactly the same as those in a conventional IVF procedure without ICSI. Therefore, the success of the treatment does not depend on the number and mobility of sperm. ICSI was originally developed to treat cases of male infertility or abnormalities in

[7] Judging the embryo's stage of development according to morphological criteria is an indirect method, and is thus subject to prognostic vagueness. The selection and further culturing of the embryos has to be done at the stage of the impregnated fertilized egg, under the Embryo Protection Act (ESchG) (Revermann and Hüsing 2010: 41). Therefore, this morphological evaluation is not comparable to the eSET.

[8] "In each individual case, the criteria for determining how many fertilized eggs should be cultivated longer so that after 5 days in vitro a maximum of three promising embryos can be transferred will depend on the characteristics and medical history of the couple (age, number, and outcome of previous treatments). However, more than three fertilized eggs may be kept prior to the fusion of the nuclei (2-PN stage). Thus, this practice is beneficial only for couples who have a certain number of fertilised eggs at their disposal" (DIR 2011: 12 – own translation).

sperm, and since then has proved to be a major advance in the treatment of subfertility of male origin. In the application of this technique, healthy women need to undergo fertility treatment. Today, ICSI is routinely used to fertilise cryopreserved eggs or treat idiopathic infertility, or in cases in which conventional IVF has not been successful. Worldwide and in Germany specifically, ICSI is now used more often than conventional IVF. A basic disadvantage of ICSI relative to IVF is that natural selection of sperm in the fertilisation of the egg is replaced by artificial selection. This could be associated with an elevated risk of genetic disorders, although the different studies which have investigated this question have generated contradictory results (Revermann and Hüsing 2010: 39).

### *13.3.4 Cryopreservation*

Human gametes and embryos can be preserved through a process of freezing at around −196°C. This process, called cryopreservation, is a widely used assisted reproduction technique. The cryopreservation of embryos and impregnated egg cells has become increasingly common in countries around the world, provided their legal norms permit the procedure. "In Germany, the cryopreservation of impregnated egg cells is practiced extensively, in particular because of the prohibition on creating and preserving 'leftover' embryos" (Revermann and Hüsing 2010: 43 – own translation).[9] The advantage to cryopreserving supernumerary fertilised egg cells at the stage prior to the fusion of the two nuclei (2-PN stage) is that there is no need for the repeated hormonal stimulation of women's ovulation and a retrieval of mature eggs, or for the use of the expensive ICSI method. While today the cryopreservation of sperm is routinely done, the cryopreservation of unfertilised egg cells is still technically challenging because of their sensitiveness (Griesinger et al. 2008). But the new technique of vitrification, in which egg cells are frozen within a few seconds, appears to represent a breakthrough (Spiewak 2013). Cryopreservation can also be applied to female and male gametes, and is thus also a method for preserving fecundity in patients preparing to undergo radiation or chemo therapy. For social reasons, interest in the freezing of egg cells or embryos seems to be growing (Lawrence 2010): "More attention might be given to so-called *social freezing* (highlighted originally – H.T.), because many women feel pressured by their 'biological clock' and are concerned about the diminishing quality of their egg cells and the declining likelihood of motherhood" (Beier et al. 2012: 372 – own

[9] In the majority of European countries, the cryopreservation of leftover human embryos is the preferred procedure (Griesinger et al. 2008: 27). If the "rule of three" in the Embryo Protection Act (ESchG) is strictly followed, "supernumerary" embryos can be generated only exceptionally, while this is regularly the case if eSET or PID is being used (Riedel 2008b). In many countries with more liberal laws than those of Germany, the fate of a great number of frozen embryos currently poses complex problems (Grady 2008).

translation).[10] The cryopreservation of egg cells is legal in Germany, but the high costs of the procedure and the short optimal age span for extracting a supply of egg cells are obstacles to even wider use (Spiewak 2013).

### *13.3.5 Temporal Development of ART and Measures of Success*

Among the aims of the German IVF registry is to ensure the quality of ART by collecting data and setting national standards. The registry has been collecting data since 1982, the year when the first IVF baby was born in the Federal Republic of Germany.[11] While participation by IVF centres in the collection of data for the registry was mandatory under the guidelines of the Medical Chamber from 1998 to 2012, since 2012 clinics are no longer required to collect data (DIR 2013). Nevertheless, the registry will continue to provide IVF centres with a wealth of data. The German IVF registry collects electronically all of the data needed for a quality assessment of each initiated treatment cycle. "The prospective documentation as well as the cycle-by-cycle data collection are of particular value" (DIR 2014: 237). Unlike in some other countries (e.g., Human Fertilisation and Embryology Authority in Great Britain), the IVF registry in Germany is an association which relies on the voluntary participation of professional organisations, and thus lacks a statutory basis (Griesinger et al. 2008). The registry collects data on extracorporeal fertilisation only, and not on intrauterine forms of insemination in which the fertilisation takes place within the woman's body. So far, there is no insemination registry in Germany.[12] In 2013, 130 out of 131 IVF centres which participate in the German IVF registry had exported their data into the registry (DIR 2014: 9).

Over the past 10 years, the practice of endocrinology and reproductive medicine in Germany has been moving out of the universities and into the private sector. The main reasons for this shift appear to be the lower remuneration of ART practitioners by the universities and increasing economic pressure. As a result, more than 80 % of ART treatments are taking place in the private sector (Beier et al. 2012: 351).

[10] This is the topic of the Dutch documentary "Eggs for later", which was produced in 2010 (http://www.imdb.com/video/wab/vi1370856473/). A 2013 poll conducted by the Cologne market research institute YouGov in Germany found that 27 % of the 536 women surveyed said they could imagine having their egg cells frozen to ensure that they can fulfil their desire to have a child (YouGov 2013). The debate on social freezing gained momentum when in 2014 the large US-based companies Facebook and Apple announced that they would pay for the social freezing of their employees' egg cells (Groll 2014).

[11] In 1984 the first IVF baby was born in the German Democratic Republic (Revermann and Hüsing 2010: 48).

[12] Estimates indicate that since 1970 more than 100,000 children have been born in western Germany following insemination by third party donors. Currently, about 1000 children per year in Germany are conceived through this method (Katzorke 2008: 98).

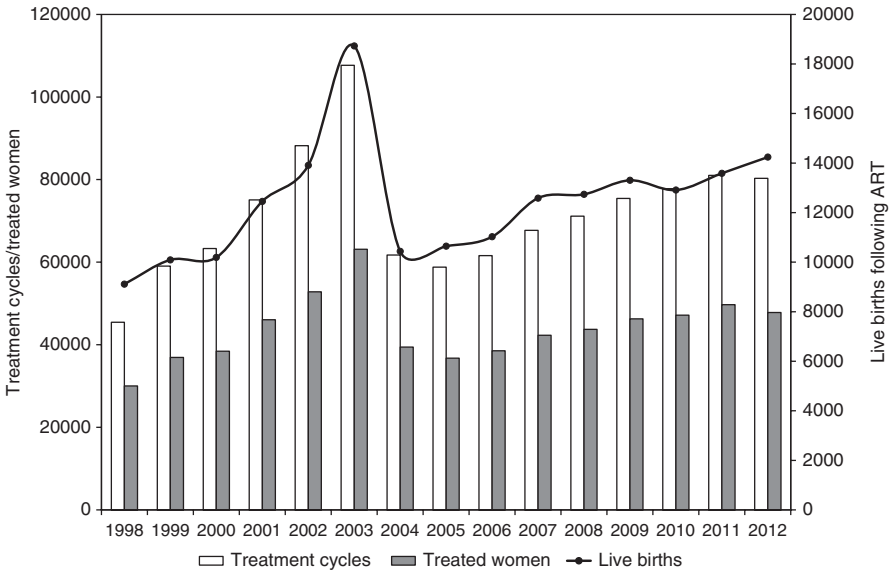


**Fig. 13.1** The development of ART in Germany, 1998–2012 (Source: DIR 1999–2014 (own calculations))

"International lab networks are on the rise, and the takeover of IVF centres by private investors is nothing new" (DIR 2012: 13).

Figure 13.1 provides an overview of the development of ART over time since the beginning of reliable data collection. Up to 2003, the number of treatment cycles and the number of treated women[13] rose continuously. Over the same period, the number of live births resulting from fertility treatments also increased. Growth was particularly strong between 2002 and 2003, as couples and physicians were aware of the upcoming reduction in reimbursement levels. Physicians thus appear to have been performing treatments in that period which otherwise might have been performed the next year. The decline between 2003 and 2004 was especially large. Since then, the absolute numbers have reflected the consequences of the changes in reimbursement mandated in the GMG. In 2013, there were about as many treatment cycles as there were between 2001 and 2002. The mean age at fertility treatment among both women and men has increased rapidly: in 2013, it was 35.2 years for women and 38.6 years for men (DIR 2014: 28). In addition, some observers have argued that the rise in the use of treatments which are not covered by statutory health insurance is a sign that many couples are turning to privately financed treatments.[14] Since 2004, there has again been a steady increase in the number of treat-

[13] Even in cases in which the male partner is the cause of subfertility, the registry counts only fertility treatments among women.

[14] More detailed analyses of the reduction in reimbursement related to ART have shown that it is necessary to distinguish between short-term and long-term effects on use (Connolly et al. 2009).

ment cycles and in the number of live births following ART. The number of treatment cycles was roughly proportional to the number of treated women; on average, the number of treatment cycles per woman was between 1.5 and 1.7. Particularly telling is the share of live births resulting from ART among all live births: the share was largest in 2003, when it reached 2.6 %; whereas by 2012, the share was 2.1 % (own calculation).[15]

The IVF registry data clearly show that the success of ART is age dependent: "The likelihood of a pregnancy following ART is about 27 % per cycle after age 35 and it declines to 15 % per cycle at age 40" (Beier et al. 2012: 353 – own translation). This pattern is accompanied by increasing rates of miscarriage among women ages 35 and older (DIR 2014: 22–23). Overall, miscarriage rates have fallen over time. Another positive trend is that because of improvements in the quality of stimulation and in oocyte treatment, along with changes in transfer technology, the mean number of transferred embryos decreased by about 25 % between 1998 and 2012.

This development is associated with a further reduction in the share of multiple deliveries. Between 1998 and 2012, the proportion of triplets among all IVF newborns decreased by almost 80 %. In 2012, an average of less than two embryos were transferred per treatment cycle, which may be expected to improve the chances of a successful pregnancy (DIR 2014: 18).[16] The fact that transferring more than one embryo at a time increases the likelihood of multiple pregnancies is often seen as the most problematic aspect of ART. Compared with single pregnancies, multiple pregnancies are associated with higher morbidity and mortality risks for embryos and infants and increased health-related risks for women. Moreover, multiple births can have serious mental, social, and economic consequences for families.[17] In many countries, the use of diagnostic options like eSET is encouraged in an effort to limit the number of multiple pregnancies. For instance, in Sweden eSET is widely used to transfer only one embryo in each cycle (Revermann and Hüsing 2010). Of the live births resulting from ART in Germany in 2012, 66.5 % were singletons, 31.9 % were twins, and 1.6 % triplets (DIR 2014: 31).[18] Births following the use of ART therefore accounted for about 20 % of all multiple deliveries (own calculation).

The most common indicator of the success of ART is the pregnancy rate, defined as the percentage of clinical pregnancies per treatment. The data needed to track clinical pregnancies can be collected relatively quickly and completely, whereas the

[15] The last European comparison of data on ART for 2010, conducted by the European Society of Human Reproduction and Embryology (ESHRE), found that in Germany the share of infants conceived through ART relative to all births was about 2.1 %. The countries with larger shares were Denmark (5.9 %), Slovenia (5.1 %), and Iceland (4.4 %) (Kupka et al. 2014: 2104).

[16] It is noteworthy that the trend towards transferring fewer embryos did not stop when the GMG took effect: "The decision about the number of embryos that should be transferred was influenced by personal, health-related, and economic considerations" (Revermann and Hüsing 2010: 98).

[17] If there are strong medical reasons, multiple pregnancies have to be reduced. To prevent extreme preterm births and to limit related risks, fetal reduction is carried out via induced abortion of single embryos. In 2012 in Germany, this was done in 254 cases affecting 380 embryos (DIR 2014: 14).

[18] Of all live births in Germany (2012), only 3.5 % were from multiple deliveries (Statistisches Bundesamt 2014).

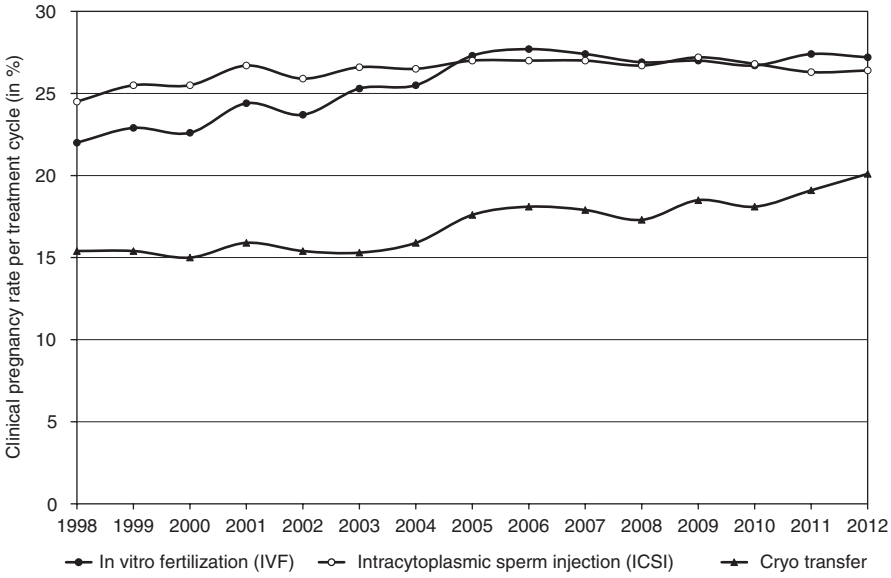


**Fig. 13.2** The development of clinical pregnancy rates following ART in Germany, 1998–2012 (Source: DIR 1999–2014 (own calculations))

data on births following ART are often incomplete because it is difficult to link the data on the women who received treatment to information on subsequent births (Revermann and Hüsing 2010).

Figure 13.2 shows a clear increase in pregnancy rates following ART between 1998 and 2012. The rates rose for so-called fresh cycles (IVF, ICSI), but also for cryo transfers (frozen-thawed transfer, mostly in the 2-PN stage). It is important to note that pregnancy rates were higher following IVF and ICSI treatments than they were following cryo transfers. ICSI seems to have performed somewhat better than IVF from 1998 to 2004; thereafter, however, the pregnancy rates resulting from each of the two treatments can hardly be distinguished. Nonetheless, since 1998 ICSI has been used far more frequently in Germany than conventional IVF. Thus, the profiles of the patients who were treated with the respective methods might have shifted (Revermann and Hüsing 2010).

For couples and their attending physicians, a far more important indicator of the success of ART is the so-called "baby take-home rate", or the percentage of live births per treatment cycle. This rate is considerably lower than the clinical pregnancy rate (Fig. 13.3).

The trend of the baby take-home rate more or less reflects the temporal development of the pregnancy rates, but at a lower level. In 2012, a baby take-home rate of about 18 % after IVF or ICSI had been achieved. The rate was far lower following cryo transfers, as this method is associated with lower pregnancy rates and higher miscarriage rates. Overall, the baby take-home rate rose slightly between 1998 and 2012. This is remarkable because the mean age of the women and the men seeking

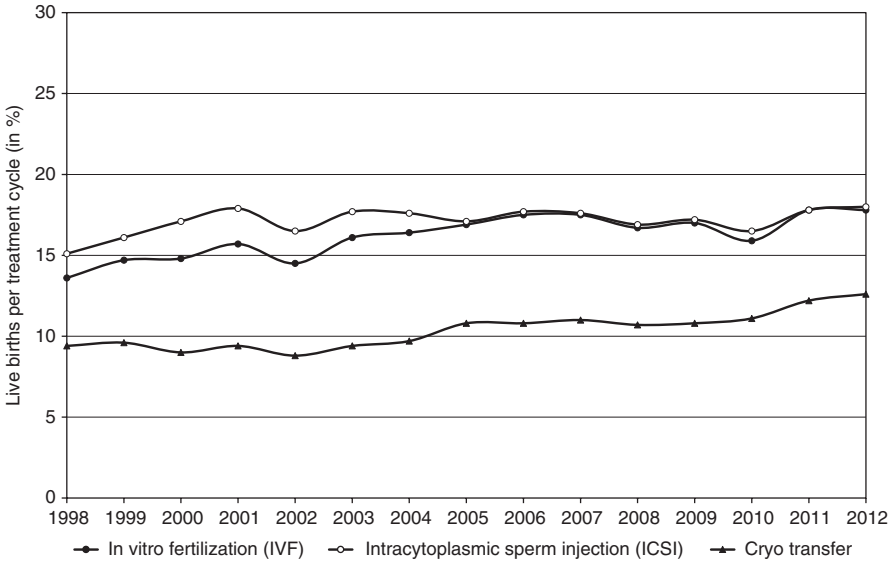


**Fig. 13.3** The development of the baby take-home rate following ART in Germany, 1998–2012 (Source: DIR 1999–2014 (own calculations))

fertility treatment had been increasing rapidly and continuously during this time (DIR 2014: 28). Currently, the mean pregnancy rate after ART in Germany is only slightly below the European average, while the baby take-home rate corresponds to the European average.[19] Internationally, the further decline in the share of multiple pregnancies and deliveries and the reduction in the proportion of preterm births are considered signs of success, particularly among physicians of reproductive medicine (Wischmann 2012: 86). Due to improved medical and technical options, the use of ICSI and cryopreservation is increasing and the number of embryos transferred per cycle is declining, not only in Germany and across Europe, but also in other countries around the world (Revermann and Hüsing 2010).

The estimates of the rates of childlessness for bio-medical reasons vary widely for Germany. Revermann and Hüsing (2010: 18) have vaguely stated that between 0.5 and 1.5 million, or between three and 10 % of German couples, are involuntarily childless. Meanwhile, other scholars have estimated that between 1.2 and 1.5 million German couples are unable to conceive (Diedrich 2008). According to Sütterlin (2009: 1), every seventh German couple, or around 14 % of couples, experience involuntary childlessness. This value is closer to the figure mentioned by Michelmann (2008: 2), of between 10 and 15 % of all couples.[20] It should be noted, however, that

[19] Compared to Germany, the baby take-home rate is higher in the UK, Slovenia, Sweden, Norway, Iceland, and some formerly socialist countries (Revermann and Hüsing 2010: 96; Kupka et al. 2014: 2104).

[20] Beier et al. (2012) calculated based on a microsimulation model that the increase in the average age of women at first birth between 1985 and 2007 in West Germany contributed to an increase in involuntary childlessness from 3.5 % to 6.5 %.

all of these estimates of the extent of involuntary childlessness are based on data on the demand for ART, and are thus affected by the blurred lines between temporary and permanent childlessness. Given the lack of reliable data on involuntary childlessness, self-assessments by individuals of their own fecundity can be very informative. In the German Family Panel (pairfam), which covers certain birth cohorts (Huinink et al. 2011),[21] both the male and the female respondents had been asked whether it was possible for them and their partner to procreate by natural means. In the first wave (2008/09), between eight and nine per cent of women and men aged 35–39 replied that natural conception was probably or definitely not possible for them. Meanwhile, between 7 and 8 % of the respective partners of these respondents concurred with these assessments. Among the study participants who were 10 years younger, 3 % reported having fertility problems. Overall, it appears that the share of the German population who are concerned about their prospects for biological procreation is sizeable.

The question of whether – and, if so, to what extent – ART can contribute to a stabilisation or an increase in cohort fertility is difficult to answer. Based on complete fertility histories for Danish women, Sobotka et al. (2008: 95) estimated that for women of the birth cohort 1978 the net effect of ART is between 3 and 4 %. Among the factors which contribute to this relatively strong effect are easy access to ART treatments, public awareness of treatment options, increasing subfertility linked to the continued postponement of childbearing, and the relatively frequent use of ART among younger women and among mothers trying to have another child. At the same time, the authors expressed scepticism about suggestions that ART should be integrated into pronatalist policies, in part because they believe that promoting the illusion that fecundity is possible at higher reproductive ages could prove problematic.[22] Based on their analyses for West Germany, Beier et al. (2012) concluded that if the provision of ART continues at around current levels, the extent to which these treatments can compensate for the postponement of fertility will be negligible from a demographic perspective. Nevertheless, as the data on the temporal development of the baby take-home rate (Fig. 13.3) have shown, reproductive medicine can make an important contribution at the individual level by helping couples fulfil their desire to have a child. This is particularly relevant because involuntary childlessness is still a social taboo which can have grave psychological and mental implications for individuals (Hyatt 2012).

[21] This paper uses data from the German Family Panel pairfam, coordinated by Josef Brüderl, Karsten Hank, Johannes Huinink, Bernhard Nauck, Franz Neyer, and Sabine Walper. Pairfam is funded as long-term project by the German Research Foundation (DFG).

[22] This argument has also been put forward by Rainer et al. (2011), who emphasised that if ART was widely available, women might be tempted to postpone the births of their children until even later in the life course. This "behavioural effect" of postponement is likely to reduce the fertility rate in countries with high fertility in particular.

## 13.4 Discussion

"The declared ethos of reproductive medicine acknowledges the significance of the individual desire to have a child, and it affirms the right of couples to make their own procreation decisions" (Beier et al. 2012: 359 – own translation). Currently, the ability of German couples to make their own fertility treatment decisions is subject to legal restrictions, including prohibitions on the use of certain techniques, like egg cell donation, surrogacy, and reproductive cloning. However, in light of global changes in technologies and values, the debate about these legal obstacles may be expected to continue among experts and the public. Thus, in time, many of these restrictions will likely be challenged and overturned. A multifaceted societal debate is highly desirable, as it touches on fundamental aspects of the protection of human dignity, including questions about the beginning of human life and the essence of a life worth living. On the other hand, the freedom of individuals to make their own procreation decisions may be restricted in practice if access to ART services is limited. This is especially likely to be the case for economically disadvantaged population groups. ART has been relatively expensive in Germany particularly since the passage of the GMG in 2004, which substantially increased the co-payments for fertility treatments. Moreover, the legally and professionally defined criteria for access to reproductive medicine tend to exclude some social groups, including unmarried couples, same-sex couples, and singles. This tendency towards exclusion is attributable in part to the fact that the legal status of a sperm donor relative to any children conceived through his donation has not been fully clarified, particularly if the children are born out of wedlock. But the main reason certain social groups are excluded is the continued dominance of traditional cultural ideals of the family, which dictate that children should grow up in a home with two married biological parents (Herrmann-Green 2008). Groups who are not permitted to access ART services in Germany often have to seek out services in hospitals abroad.[23] The allocation of access to ART services in Germany privileges particular living arrangements, and is based on the cultural ideal of a "normal family" rooted in the interrelation of marriage and procreation. The more this family ideal comes under pressure due to on-going social changes, the more people will demand a liberalisation of access to reproductive medicine. Thus, the debate over access to assisted reproduction has the potential to challenge well-established attitudes about the family, and in so doing to unsettle deeply entrenched concepts about reproduction, motherhood, fatherhood, and kinship. The extent to which this actually occurs depends on the specific social conditions. In the case of Germany, it is interesting from a social science perspective to observe that social fatherhood and motherhood are still perceived differently by

[23] Worldwide, the rising demand for and the increasing shortage of egg cells has led to an international market in egg cells and fertility tourism. "The development of reproductive tourism is related to an extension of the supply as well as to the structural and economic inequities between countries and regions" (Berg 2008: 244 – own translation). Egg cell donation and surrogacy are aspects of the global commercialisation of the female body (Rudrappa 2012).

the legal system, with sperm donation by a third party donor being allowed while egg cell donation is prohibited.

Reproductive medicine is barely 40 years old, and is thus a young discipline which is still developing extremely rapidly. Not surprisingly, certain problems related to reproductive medicine remain unresolved. These problems often result from particular legal situations and corresponding value conflicts (Riedel 2008b). The unintended consequences of certain ART treatments did not become obvious until the first generation of children conceived by ART grew older. Now, however, it is generally recognised that allowing children to know their genetic origin is essential, not only for medical reasons, but also for reasons of personal identity. This presupposes that children will be told about their conception, that reproductive donations will not occur anonymously, and that the relevant data on donors will be stored and preserved in a central location. Revermann and Hüsing (2010: 228) have pointed out that the safety, the risks, and especially the consequences of ART over time have not been subjected to the same investigative rigour as the medical techniques. From an ethical standpoint, new courses of action always entail new responsibilities (Kreß 2013).

To evaluate the potential of ART, a broad societal debate about the opportunities and implications of these technologies is certainly needed. At present, the success rates of fertility treatments tend to be overstated, while the emotional strain of undergoing these treatments is often underestimated (Revermann and Hüsing 2010). The desire to have a child at any age cannot be fulfilled. Education and counselling should help to lower the barriers to seeking fertility treatment, and to alleviate widespread social biases regarding subfertility, particularly among men (Thorn 2008). In the future, topics like the "social freezing" of egg cells and new diagnostic options for preserving embryos may be expected to dominate the debate on the socially acceptable and desirable implications of ART. On the one hand, reproductive medicine can be seen as expression of a deeply rooted human desire to achieve emancipation from nature. But on the other, these technologies break taboos and call into question traditional ideas of what it means to be human (Rauprich and Siegel 2003).

## Literature

Ahr, N., & Hawranek, C. (2014, October 9). Reproduktionsmedizin: Die gespendeten Kinder [Reproductive medicine: The donated children]. *Die Zeit*, *40*.

Bahnsen, U., & Spiewak, M. (2008, May 29). Reproduktionsmedizin: Die Zukunftskinder [Reproductive medicine: Children of the future]. *Die Zeit*, *23*.

Beier, H. M., van den Daele, W., Diedrich, K., Dudenhausen, J. W., Felberbaum, R., & Gigerenzer, G., et al. (2012). Medizinische und biologische Aspekte der Fertilität [Medical and biological aspects of fertility]. In G. Stock, H. Bertram, A. Fürnkranz-Prskawetz, W. Holzgreve, M. Kohli, & U. M. Staudinger (Eds.), *Zukunft mit Kindern: Fertilität und gesellschaftliche Entwicklung in Deutschland, Österreich und der Schweiz* [Future with children: Fertility and social development in Germany, Austria, and Switzerland] (pp. 294–391). Frankfurt/New York: Campus.

Berg, G. (2008). Die Eizellspende – eine Chance für wen? [The donation of egg cells – a chance for whom?] In G. Bockenheimer-Lucius, P. Thorn, & C. Wendehorst (Eds.), *Umwege zum*

*eigenen Kind: Ethische und rechtliche Herausforderungen an die Reproduktionsmedizin 30 Jahre nach Louise Brown* [Detours to a child of one's own: Ethical and legal challenges of reproductive medicine 30 years after Louise Brown] (pp. 239–253). Göttingen: Universitätsverlag.

Bergmann, S. (2011). Fertility tourism: Circumventive routes that enable access to reproductive technologies and substances. *Signs, 36*, 280–289.

Berlin-Institut für Bevölkerung und Entwicklung. (2007). *Ungewollt kinderlos – Was kann die moderne Medizin gegen den Kindermangel in Deutschland tun?* [Involuntarily childless – What can be done by modern medicine against the shortage of children in Germany?] Berlin: Berlin-Institut für Bevölkerung und Entwicklung.

Bundesärztekammer (Medical Chamber). (2006). *(Muster-)Richtlinie zur Durchführung der assistierten Reproduktion* [Guideline on the realization of assisted reproduction]. http://www.bundesaerztekammer.de/downloads/AssRepro.pdf. Accessed 9 Mar 2015.

Bundesverfassungsgericht (Federal Constitutional Court). (2009). Pressemitteilung [Press release] Nr. 24/2009. http://www.bverfg.de/pressemitteilungen/bvg09-024.html. Accessed 9 Mar 2015.

Connolly, M. P., Griesinger, G., Ledger, W., & Postma, M. J. (2009). The impact of introducing patient co-payments in Germany on the use of IVF and ICSI: A price-elasticity of demand assessment. *Human Reproduction Update, 24*, 2796–2800.

Correll, L. (2010). *Anrufungen zur Mutterschaft* [Invocations to motherhood]. Münster: Westfälisches Dampfboot.

Diedrich, K. (2008). Einleitung [Introduction]. In K. Diedrich, R. Felberbaum, G. Griesinger, H. Hepp, H. Kreß, & U. Riedel (Eds.), *Reproduktionsmedizin im internationalen Vergleich – Wissenschaftlicher Sachstand, medizinische Versorgung und gesetzlicher Regelungsbedarf* [Reproductive medicine in international comparison – Scientific state of affairs, medical provision, and necessity for legal regulation] (pp. 8–10). Frankfurt: Friedrich-Ebert-Stiftung.

Diedrich, K., & Griesinger, G. (2006). Deutschland braucht ein Fortpflanzungsmedizingesetz [Germany needs a comprehensive law for all aspects of assisted human reproduction]. *Geburts- und Frauenheilkunde, 66*, 345–348.

DIR – Deutsches IVF-Register (German IVF registry). (2014). *Jahrbuch 2013 sowie zurückliegende Jahrgänge* [Annual 2013 and earlier annuals]. http://www.deutsches-ivf-register.de. Accessed 9 Mar 2015.

Dokumentarfilm (Documentary) „Eggs for later": http://www.imdb.com/video/wab/vi1370856473/. Accessed 9 Mar 2015.

Dorn, C. (2013). Inseminationsbehandlung [Assisted insemination]. In Diedrich, K., Ludwig, M., & Griesinger, G. (Eds.), *Reproduktionsmedizin* [Reproductive medicine] (pp. 197–207). Wiesbaden: Springer VS.

EschG – Gesetz zum Schutz von Embryonen (Embryonenschutzgesetz, The Embryo Protection Act). http://www.auswaertiges-amt.de/cae/servlet/contentblob/480804/publicationFile/5162/EmbryoProtectionAct.pdf. Accessed 9 Mar 2015.

Grady, D. (2008, December 4). Parents torn over fate of frozen embryos. *New York Times*.

Griesinger, G., Felberbaum, R., Hepp, H., & Diedrich, K. (2008). Reproduktionsmedizin in Deutschland und im internationalen Vergleich [Reproductive medicine in Germany and in international comparison]. In K. Diedrich, R. Felberbaum, G. Griesinger, H. Hepp, H. Kreß, & U. Riedel (Eds.), *Reproduktionsmedizin im internationalen Vergleich – Wissenschaftlicher Sachstand, medizinische Versorgung und gesetzlicher Regelungsbedarf* [Reproductive medicine in international comparison – Scientific state of affairs, medical provision, and necessity for legal regulation] (pp. 22–61). Frankfurt: Friedrich-Ebert-Stiftung.

Groll, T. (2014, October 20). Social Freezing: Der eingefrorene Lebensentwurf [Social freezing: The frozen script of life]. *Die Zeit,* online.

Herrmann-Green, L. (2008). Lesben mit Kinderwunsch: Eine ethische Herausforderung für die Reproduktionsmedizin? [Lesbians with a desire to have a child: An ethical challenge for reproductive medicine?] In G. Bockenheimer-Lucius, P. Thorn, & C. Wendehorst (Eds.), *Umwege zum eigenen Kind: Ethische und rechtliche Herausforderungen an die Reproduktionsmedizin*

*30 Jahre nach Louise Brown* [Detours to a child of one's own: Ethical and legal challenges of reproductive medicine 30 years after Louise Brown] (pp. 217–237). Göttingen: Universitätsverlag.

Huinink, J., Brüderl, J., Nauck, B., Walper, S., Castiglioni, L., & Feldhaus, M. (2011). Analysis of intimate relationships and family dynamics (pairfam): Conceptual framework and design. *Zeitschrift für Familienforschung, 23*, 77–101.

Hyatt, M. (2012). *Ungestillte Sehnsucht: Wenn der Kinderwunsch uns umtreibt* [Unsettled longing: When the desire for a child is always on our mind]. Berlin: Ch. Links Verlag.

Katzorke, T. (2008). Entstehung und Entwicklung der Spendersamenbehandlung in Deutschland [Emergence and development of sperm donation in Germany]. In Bockenheimer-Lucius, G., Thorn, P., & Wendehorst, C. (Eds.), *Umwege zum eigenen Kind: Ethische und rechtliche Herausforderungen an die Reproduktionsmedizin 30 Jahre nach Louise Brown* [Detours to a child of one's own: Ethical and legal challenges of reproductive medicine 30 years after Louise Brown] (pp. 89–101). Göttingen: Universitätsverlag.

Kentenich, H., & Griesinger, G. (2013). Zum Verbot der Eizellspende in Deutschland: Medizinische, psychologische, juristische und ethische Aspekte [On the proscription of egg cell donation in Germany: Medical, psychological, legal, and ethical aspects]. *Journal für Reproduktionsmedizin und Endokrinologie, 10*, 273–278.

Kreß, H. (2013). Ethik: Reproduktionsmedizin im Licht von Verantwortungsethik und Grundrechten [Ethics: Reproductive medicine in light of ethics of responsibility and fundamental rights]. In Diedrich, K., Ludwig, M., & Griesinger, G. (Eds.), *Reproduktionsmedizin* [Reproductive medicine] (pp. 651–670). Wiesbaden: Springer VS.

Kreyenfeld, M., & Konietzka, D. (2013). Kinderlosigkeit in Deutschland. Theoretische Probleme und empirische Ergebnisse [Childlessness in Germany. Theoretical problems and empirical results]. In Konietzka, D., & Kreyenfeld, M. (Eds.), *Ein Leben ohne Kinder: Ausmaß, Strukturen und Ursachen von Kinderlosigkeit* [A life without children: Extent, structures, and causes of childlessness] (pp. 13–44). Wiesbaden: Springer VS.

Kupka, M. S., Ferraretti, A. P., de Mouzon, J., Erb, K., D'Hooghe, T., Castilla, J. A., et al. (2014). Assisted reproductive technology in Europe, 2010: Results generated from European registers by ESHRE. *Human Reproduction Update, 29*, 2099–2113.

Küpker, W. (2013). Regulation der Reproduktionsmedizin im europäischen Vergleich [Regulation of reproductive medicine in European comparison]. In Diedrich, K., Ludwig, M., & Griesinger, G. (Eds.), *Reproduktionsmedizin* [Reproductive medicine] (pp. 631–637). Wiesbaden: Springer VS.

Lawrence, G. E. St. (2010, July 6). By freezing embryos, couples try to utilize fertility while delaying parenthood. *Washington Post*.

Ludwig, M., Diedrich, K., & Nawroth, F. (2013). Was ist „Sterilität"– eine Begriffsbestimmung [What is „sterility"– a definition]. In Diedrich, K., Ludwig, M., & Griesinger, G. (Eds.), *Reproduktionsmedizin* [Reproductive medicine] (pp. 1–7). Wiesbaden: Springer VS.

Michelmann, H.-W. (2008). Reproduktionsmedizin im Jahre 2008: Probleme – Wünsche – Lösungsansätze [Reproductive medicine in 2008: Problems – desires – methods of resolution]. In G. Bockenheimer-Lucius, P. Thorn, & C. Wendehorst (Eds.), *Umwege zum eigenen Kind: Ethische und rechtliche Herausforderungen an die Reproduktionsmedizin 30 Jahre nach Louise Brown* [Detours to a child of one's own: Ethical and legal challenges of reproductive medicine 30 years after Louise Brown] (pp. 1–8). Göttingen: Universitätsverlag.

Möller, K.-H. (2013). Rechtliche Regelung der Reproduktionsmedizin in Deutschland [Legal regulation of reproductive medicine in Germany]. In Diedrich, K., Ludwig, M., & Griesinger, G. (Eds.), *Reproduktionsmedizin* [Reproductive medicine] (pp. 583–606). Wiesbaden: Springer VS.

Passet-Wittig, J., Letzel, S., Schneider, N. F., Schuhrke, B., Seufert, R., Zier, U., et al. (2014). *The PinK study – Methodology of the baseline survey of a prospective cohort study of couples undergoing fertility treatment*. Wiesbaden: Federal Institute for Population Research.

PIDV – Verordnung zur Regelung der Präimplantationsdiagnostik (By-laws on the regulation of PID). http://www.bmg.bund.de/fileadmin/dateien/Downloads/P/PID/PIDVE_121114.pdf. Accessed 9 Mar 2015.

PräimpG – Gesetz zur Regelung der Präimplantationsdiagnostik (Law on PID) (Präimplantationsdiagnostikgesetz). http://www.bundesgerichtshof.de/SharedDocs/Downloads/DE/Bibliothek/Gesetzesmaterialien/17_wp/PID/bgbl.pdf;jsessionid=7A29046574C95F59D0ACCBAC657246D4.2_cid354?__blob=publicationFile. Accessed 9 Mar 2015.

Rainer, H., Selvaretnam, G., & Ulph, D. (2011). Assisted reproductive technologies (ART) in a model of fertility choice. *Journal of Population Economics, 24*, 1101–1132.

Rauprich, O. (2008). Sollen Kinderwunschbehandlungen von den Krankenkassen finanziert werden? Ethische und rechtliche Aspekte [Shall ART treatments be publicly financed? Ethical and legal aspects]. In G. Bockenheimer-Lucius, P. Thorn, & C. Wendehorst (Eds.), *Umwege zum eigenen Kind: Ethische und rechtliche Herausforderungen an die Reproduktionsmedizin 30 Jahre nach Louise Brown* [Detours to a child of one's own: Ethical and legal challenges of reproductive medicine 30 years after Louise Brown] (pp. 31–47). Göttingen: Universitätsverlag.

Rauprich, O., & Siegel, S. (2003). Der Natur den Weg weisen: Ethische Aspekte der Reproduktionsmedizin [To show nature the path: Ethical aspects of reproductive medicine]. In A. Ley, & M. M. Ruisinger (Eds.), *Von Gebärhaus und Retortenbaby. 175 Jahre Frauenklinik Erlangen* [On delivery houses and test tube babies. 175 years of gynecological hospital Erlangen] (pp. 153–171). Nürnberg: Verlag W. Tümmels.

Revermann, C., & Hüsing, B. (2010). Fortpflanzungsmedizin – Rahmenbedingungen, wissenschaftlich-technische Fortschritte und Folgen [Reproductive medicine – Conditions, scientific progress, and consequences]. Berlin, Büros für Technikfolgenabschätzung beim Deutschen Bundestag. Arbeitsbericht Nr. 139.

Riedel, U. (2008a). Vorgeschichte und Stand der Gesetzgebung [Pre-history and state of legislation]. In K. Diedrich, R. Felberbaum, G. Griesinger, H. Hepp, H. Kreß, & U. Riedel (Eds.), *Reproduktionsmedizin im internationalen Vergleich – Wissenschaftlicher Sachstand, me-dizinische Versorgung und gesetzlicher Regelungsbedarf* [Reproductive medicine in international comparison – Scientific state of affairs, medical provision, and necessity for legal regulation] (pp. 11–21). Frankfurt: Friedrich-Ebert-Stiftung.

Riedel, U. (2008b). Notwendigkeit eines Fortpflanzungsmedizingesetzes (FMG) aus rechtlicher Sicht [Necessity of a comprehensive law for all aspects of assisted reproduction (FMG) from a legal perspective]. In K. Diedrich, R. Felberbaum, G. Griesinger, H. Hepp, H. Kreß, & U. Riedel (Eds.), *Reproduktionsmedizin im internationalen Vergleich – Wissenschaftlicher Sachstand, medizinische Versorgung und gesetzlicher Regelungsbedarf* [Reproductive medicine in international comparison – Scientific state of affairs, medical provision, and necessity for legal regulation] (pp. 88–111). Frankfurt: Friedrich-Ebert-Stiftung.

Robert Koch-Institut. (2004). *Gesundheitsberichterstattung des Bundes* [Health report by the Federal government], Themenheft 20 „Ungewollte Kinderlosigkeit". Berlin: Robert Koch-Institut.

Rudrappa, S. (2012). India's reproductive assembly line. *Contexts, 11*, 22–27.

Sobotka, T., Hansen, M. A., Jensen, T. K., Pedersen, A. T., Lutz, W., & Skakkebæk, N. E. (2008). The contribution of assisted reproduction to completed fertility: An analysis of Danish data. *Population and Development Review, 34*, 79–101.

Spiewak, M. (2009, July 16). Medizin – Die Ausweitung der Grauzone [Medicine – The extension of the twilight zone], *Die Zeit,* 30.

Spiewak, M. (2011, July 3). Eizellspende – Für ein Baby nach Prag [Egg cell donation – For a baby to Prague], *Die Zeit,* 45.

Spiewak, M. (2013, July 11). Später Kinderwunsch – Die biologische Uhr anhalten [Late desire for a child – Stopping the biological clock], *Die Zeit,* 29.

Statistisches Bundesamt. (2014). *Natürliche Bevölkerungsbewegung* [Natural changes of population] – Fachserie 1, Reihe 1.1. Wiesbaden: Statistisches Bundesamt.

Steptoe, P. C., & Edwards, R. G. (1978). Birth after the reimplantation of a human embryo. *Lancet, 312*, 366.

Sütterlin, S. (2009). Ungewollte Kinderlosigkeit [Involuntary childlessness]. Online-Handbuch Demografie des Berlin-Instituts für Bevölkerung und Entwicklung: http://www.berlin-institut.org/online-handbuchdemografie/bevoelkerungsdynamik/auswirkungen/ungewollte-kinderlosigkeit.html. Accessed 9 Mar 2015.

Thorn, P. (2008). Samenspende und Stigmatisierung – ein unauflösbares Dilemma? [Sperm donation and stigmatizaion – an inextricable dilemma?] In G. Bockenheimer-Lucius, P. Thorn, C. Wendehorst (Eds.), *Umwege zum eigenen Kind: Ethische und rechtliche Herausforderungen an die Reproduktionsmedizin 30 Jahre nach Louise Brown* [Detours to a child of one's own: Ethical and legal challenges of reproductive medicine 30 years after Louise Brown] (pp. 135–155). Göttingen: Universitätsverlag.

Trappe, H. (2015). Reproduktionsmedizin in Deutschland: Eine Bestandsaufnahme aus bevölkerungssoziologischer Sicht [Reproductive medicine in Germany: An inventory from a perspective of population sociology]. In Niephaus, Y., Kreyenfeld, M., & Sackmann, R. (Eds.), *Handbuch Bevölkerungssoziologie* [Handbook population sociology] (forthcoming). Wiesbaden: Springer VS.

Wischmann, T. (2012). *Einführung Reproduktionsmedizin: Medizinische Grundlagen – Psychosomatik – Psychosoziale Aspekte* [Introduction reproductive medicine: Medical foundation – psychosomatic – psychosocial aspects]. München/Basel: Ernst Reinhardt Verlag.

YouGov. (2013). Künstliche Befruchtung: Jede vierte Frau würde sich ihre Eizellen einfrieren lassen [Assisted reproduction: Every fourth woman would freeze her egg cells]. http://yougov.de/news/2013/10/15/kunstliche-befruchtung-jede-vierte-frau-wurde-sich/. Accessed 9 Mar 2015.



# Chapter 14
# Assisted Reproductive Technology in Europe: Usage and Regulation in the Context of Cross-Border Reproductive Care

**Patrick Präg and Melinda C. Mills**

## 14.1 Introduction

Involuntary childlessness, or infertility, is a condition that affects a sizeable number of couples around the world (Mascarenhas et al. 2012). Assisted reproductive technologies (ART) represent an important set of techniques for addressing involuntary childlessness. While it has always been difficult to make a precise distinction between voluntary and involuntary childlessness, the main reasons for childlessness, such as the perceived lack of a suitable partner or problems associated with balancing work and family, can be seen as both voluntary and involuntary (Sobotka 2010). The current trend of fertility postponement in European societies (Mills et al. 2011) has exacerbated the issue of involuntary childlessness. While it is clear that female fecundity declines sharply at higher ages, because the pace of fecundity loss varies greatly between women, it can be difficult for an individual woman to ascertain how long she can postpone childbearing (te Velde and Pearson 2002; te Velde et al. 2012).

ART is increasingly perceived as being one way to alleviate the problems of involuntary childlessness. Between the birth in 1978 of Louise Brown, the first live ART baby (Steptoe and Edwards 1978), and the awarding of the Nobel Prize in Physiology or Medicine to Robert G. Edwards for the development of *in vitro* fertilization in 2010, ART had become a standard medical practice and a profitable commercial enterprise for thousands of firms in Europe. An estimated five million babies have been born with the help of assisted reproduction in the past four decades (Adamson et al. 2013), a sizable share of them in Europe.

ART generally refers to treatments in which gametes or embryos are handled *in vitro* ("in glass;" i.e., outside of the body) to establish a pregnancy. A key technique

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of ART is *in vitro fertilization* (IVF). In IVF, oocytes are fertilized using sperm in a laboratory and the embryo is surgically implanted in the woman's womb. IVF was invented to treat cases of female infertility. When only a single sperm cell is injected into the oocyte during IVF, the procedure is referred to as *intracytoplasmic sperm injection* (ICSI). ICSI was developed to tackle male fertility problems, such as a low sperm count or poor sperm quality, but has in recent years become a standard form of fertilization in ART. A *frozen* or *thawed embryo transfer* is an IVF procedure in which embryos that have been cryopreserved for storage are transferred (as opposed to a "fresh" transfer of never-frozen embryos). This procedure is often used because obtaining oocytes from a woman is a rather invasive act. Thus, after a hormonal treatment, several oocytes are collected at the same time, fertilized, and frozen for later use in case the first embryo transfer fails—which is likely, given the relatively low success rate of ART (Malizia et al. 2009). In an alternative collection strategy, immature eggs are collected from a woman and are then matured in a lab (*in vitro maturation*). This procedure may be indicated when a woman is at risk of reacting adversely to the fertility drugs given before the oocytes are collected.

*Frozen oocyte replacement* is a technique in which oocytes are retrieved, frozen, stored (oocyte cryopreservation), and fertilized only after they have been thawed for transfer. This technique provides women with the option of having genetically related children later in life, even if no suitable father is present at the time of cryopreservation. Frozen oocyte replacement was first used in cancer patients, who had oocytes retrieved and frozen before undergoing forms of chemo- or radiotherapy that could damage their ovaries. But because this technique can also be used for delaying motherhood for any reason, including the desire to pursue a career, it has attracted substantial public attention in recent years, and is sometimes referred to as "social freezing" (Mertes and Pennings 2011). Large companies, such as Facebook and Apple, have recently offered social freezing as a benefit for female employees, offering them up to $20,000 to cover the cost of egg freezing (Tran 2014).

When prospective parents are concerned about passing on hereditary diseases like cystic fibrosis, it can be useful to conduct *preimplantation genetic diagnosis* (PGD) or *screening* (PGS). PGD involves examining an embryo to determine whether specific genetic and structural alterations are present. In PGS, an embryo is examined to ascertain whether any aneuploidy, mutation, or DNA rearrangement has taken place. In cases of *egg donation*, an oocyte from a woman is fertilized and then transferred to another woman's womb. Donation may be done in cases of *surrogate motherhood* for prospective parents who are unable to carry a child, such as a gay male couple; or when a woman is unable to have her own oocytes fertilized, often because she is older. Another type of egg donation is called "egg sharing:" women who underwent ART can share any non-used frozen oocyte with other women, sometimes in exchange for a discount on their ART treatments.

Globally, Europe has the largest number of ART treatments. In 2005, the most recent year for which global data are available, 56 % of ART aspirations[1] were in

[1] Aspirations are initiated ART cycles in which one or more follicles are punctured and aspirated, irrespective of whether oocytes are retrieved. See Footnote 2 for more details on the metrics with which ART treatments are recorded.

Europe, 23 % were in Asia, and 15 % were in North America (Zegers-Hochschild et al. 2014). As many European countries have been characterized as having "lowest-low" fertility (Kohler et al. 2002), ART represents not just a means of alleviating the suffering of individuals who are involuntarily childless, but also a potential policy lever for raising fertility rates in Europe. Thus, there is substantial interest in ART among policy-makers. Another key aspect of ART in Europe is the stark variation in the rates of ART uptake and in the regulation of ART, both across countries and over time. This variation in regulations between and within European countries allows us to make comparisons that could yield important insights into the antecedents and outcomes of ART usage and could have implications for ART across the globe.

The first aim of the current study is to present comparative data on ART usage in Europe, demonstrating the wide variability across European countries. In a second step, we will explore forms of ART governance across European countries, illustrating the variation in how ART is regulated and in who gets access to which techniques. We then turn to the specific case of surrogacy, which often falls outside the scope of national ART legislation. We conclude with a related discussion on cross-border reproductive care, which is sometimes characterized as "reproductive tourism." In the concluding section, we will summarize the findings, discuss the implications, and point to areas for future research.

## 14.2 Usage of Assisted Reproductive Technologies in European Countries

The usage of ART varies considerably across European countries. Although diagnostic and treatment services are currently available in all European countries, the variation in ART usage indicates that there are substantial differences in equity of access. To explore these differences, we analyze data collected by the European IVF Monitoring (EIM) Consortium of the European Society of Human Reproduction and Embryology (ESHRE). The EIM data go back to 1997, and are based on information from national registries (with the voluntary or mandatory participation) of European countries; or, if those are not available, stem from information reported by clinics. In our analysis, we primarily focus on information from the most recent report, which contains data for the year 2010 (Kupka et al. 2014), and present information from the countries that have complete or almost complete figures.

In Fig. 14.1, we can see the high degree of variation in ART usage across Europe. The figure shows the number of treatments[2] by the main group of potential ART

[2] There are different metrics for recording ART treatments. The term "initiated ART *cycle"* refers to the menstrual cycle in which a woman receives ovarian stimulation (or, in the rare case of natural-cycle IVF, receives monitoring) with the intention of conducting ART, regardless of whether a follicular aspiration is attempted. The term "*aspiration*" refers to an attempt to retrieve oocytes from one or more follicles, regardless of whether oocytes are successfully retrieved. The term

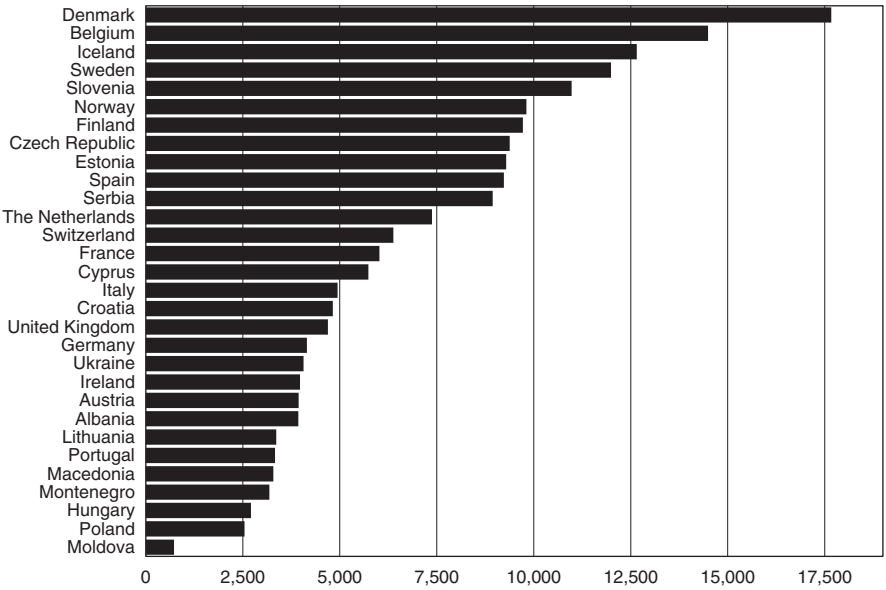


**Fig. 14.1** ART cycles per million women age 15–45 per country, 2010 (Sources: Ferraretti et al. (2012, 2013) and Kupka et al. (2014). Notes: The values for Albania, Estonia, Ireland, Lithuania, Poland, Spain, Serbia, Switzerland, and Ukraine refer to 2008; the values for Croatia, Cyprus, and France, and Denmark refer to 2009. ART cycles include IVF, ICSI, frozen embryo replacement (thawings), preimplantation genetic diagnosis and screening, egg donation (donation cycles), in vitro maturation, and frozen oocyte replacement (thawings))

patients in a country; namely, women between the ages of 15 and 45. Denmark, Belgium, Iceland, Sweden, and Slovenia are the countries where the largest numbers of ART cycles are initiated. A comparison of these four countries shows that there is substantial heterogeneity at the top of the distribution. ART treatments are considerably more common in Belgium and Denmark than in Iceland, Sweden, and Slovenia. It is also striking that the top group is not completely dominated by affluent western European countries. In addition to Slovenia, the Czech Republic, Estonia, and Serbia are also in the upper half of the distribution; well ahead of wealthy nations such as Switzerland, the Netherlands, or Germany. When we look at the bottom of the distribution, it is apparent that ART is no more widespread in Germany, Austria, or Ireland than it is in Ukraine or in Albania.

A number of studies have attempted to explain the very large differences in ART usage across countries. Several factors have emerged. ART costs and affordability appear to play an important role. Belgium and Denmark are known for their comparatively generous reimbursement policies for couples and individuals under-

"*transfer*" refers to a procedure in which embryos are placed in the uterus or Fallopian tube, irrespective of whether a pregnancy is achieved (Zegers-Hochschild et al. 2009). However, for frozen embryo replacements, frozen oocyte replacements, and egg donations, cycles and aspirations are usually not recorded; here, *thawings* and *transfers* are the relevant metrics.

going ART. In a cross-national study, Chambers et al. (2014) found that greater affordability of ART—measured as the net cost of an ART cycle in a country as a share of the average disposable income in that country—is associated with greater ART utilization. Remarkably, this finding holds even after accounting for important factors such as GDP per capita, the number of physicians, and the number of ART clinics in a country. Studies that have looked at variation within countries and over time (e.g., Hamilton and McManus 2012) have also found evidence that affordability is an important driver not only of utilization, but also of the use of safer ART practices.

Norms and beliefs also seem to play an important role for cross-national differences in ART usage. Billari et al. (2011) found that there is a large positive association between higher social age deadlines for childbearing—i.e., generally shared assumptions about when one is too old to have children—and the availability of ART in European countries. The higher the social age norm for childbearing, the greater the availability of ART clinics. Kocourkova et al. (2014) showed that ART use and the total fertility rate in a country are correlated, which they interpret as being a sign of increasing demand for children. This interpretation is plausible, as most studies have found that the net impact of ART on fertility rates is actually small (Präg et al. 2015). Mills and Präg (2015) have suggested that beliefs about the moral status of a fertilized egg—i.e., whether a human embryo is seen as a human being immediately after fertilization—are associated with ART utilization. Generally, in countries where the belief that an embryo becomes a human being right after fertilization is less widespread, ART is used more often.

In addition to the differences in the extent of ART usage in Europe, there is also considerable variation in the range of ART techniques that are utilized. Figure 14.2 reports the share of single ART treatments among all ART treatments for selected countries in 2010. The classical form of ART, *in vitro* fertilization, is no longer the most popular type of ART procedure. The share of IVF treatments among all ART treatments ranges from less than 10 % in Spain to slightly more than 40 % in Denmark. ICSI, a method invented more recently (Palermo et al. 1992) to treat male factor infertility, has overtaken IVF in recent years as the method of choice for ART (Kupka et al. 2014). The reasons for this development are not fully understood, especially because the leading professional organizations of reproductive health providers discourage the routine practice of ICSI in the absence of male factor infertility diagnoses (Boulet et al. 2015). It is likely related to what demographic researchers have called the "absent and problematic men" issue in fertility research and infertility diagnoses, as collecting data on men and establishing male factor infertility is difficult (Greene and Biddlecom 2000). Nonetheless, in virtually all of the countries displayed in Fig. 14.2, the share of ART procedures that are ICSI treatments is larger than the share of procedures that are IVF treatments. Only in Denmark is the share of ART procedures that are IVF treatments slightly larger (42 %) than the share that are ICSI treatments (35 %). In the United Kingdom, IVF and ICSI are used to a similar extent (37 and 40 %, respectively). The substantial differences between countries have been noted in the literature, yet explanations for

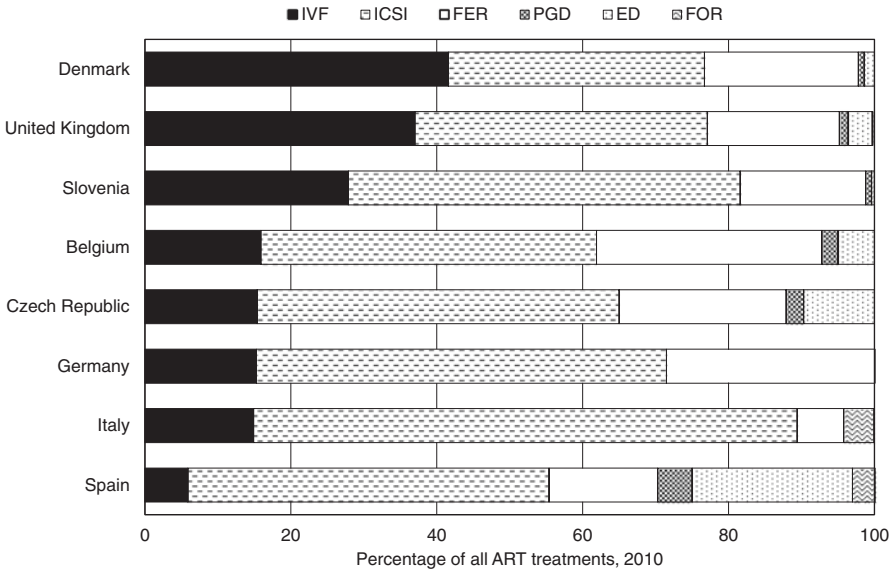


**Fig. 14.2** ART treatments in selected countries, 2010 (Notes: *IVF* in vitro fertilization (cycles), *ICSI* intracytoplasmic sperm injection (cycles), *FER* frozen embryo replacement (thawings), *PGD* preimplantation genetic diagnosis (cycles), *ED* egg donation (donations), *FOR*: frozen oocyte replacement (thawings). In vitro maturation (aspirations, 0.0–0.1 % per country) not displayed. Source: Kupka et al. (2014))

these differences are still lacking (Nyboe Andersen et al. 2008). It is, however, clear that IVF and ICSI together make up the bulk of treatments in all countries.

The third-most popular form of ART treatment is frozen embryo replacement, making up between 6 % (Italy) and 31 % (Belgium) of ART treatments. The low uptake of FER in Italy is attributable to a national law that prohibited embryo cryopreservation (except under exceptional circumstances) from 2004 to 2009 (Benagiano and Gianaroli 2010). The relative popularity of FER in Germany is surprising, as German regulations regarding embryo freezing are fairly restrictive: i.e., the non-emergency freezing of embryos is banned, and the freezing of fertilized eggs is allowed only in the earliest stages of development. Preimplantation genetic diagnosis (PGD), which has been practiced since the early 1990s (Simpson 2010), is likely the ethically most controversial form of ART. PGD has clear benefits, as it can help parents avoid passing on inheritable disorders to their children, and it is generally considered to be safe and to have a low rate of errors (Ory et al. 2014). However, fears about the creation of "designer babies" and moral concerns about the use of PGD for non-medical purposes (such as sex selection) are often expressed in public discussions about ART. The data show that very few ART procedures involve PGD: the share of all ART treatments in a country that involve PGD ranges from no reported cases (in Germany and Italy) to 4.7 % of cases (in Spain). The share is around 1 % in Denmark, Slovenia, and the United Kingdom; and is around 2 % in Belgium and the Czech Republic. Given the controversy surrounding PGD,

it is interesting to note that the procedure is generally allowed in all of the countries listed in Fig. 14.2 (Ory et al. 2014); however, Denmark and Slovenia restrict its use to screening for specific hereditary disorders.

Egg donation is also a technique that is not practiced in all countries, as can be seen in Fig. 14.2. Germany and Italy report no cases, and in Slovenia and Denmark egg donation makes up less than 2 % of ART procedures. In the United Kingdom and Belgium, the shares are slightly higher (3.3 and 5 %, respectively). In the Czech Republic and Spain a significant share (9.7 and 22 %) of ART treatments involve egg donation. As we will discuss in more detail below, it is important to note that these differences between countries are attributable in part to cross-border reproductive care. Couples and single women who are unable to obtain the desired treatment in their home country are sometimes willing to travel abroad to obtain that treatment in another country. Frozen oocyte replacement (FOR), which builds on fertilizing thawed oocytes, is a relatively rare form of ART: FOR treatments are reported only in the United Kingdom, Spain, and Italy (0.1, 3.1, and 4.1 %, respectively). One reason for the relative popularity of FOR in Italy is that the cryopreserving of embryos was banned, which created incentives to further develop and refine technologies for cryopreserving oocytes.

## 14.3 Regulation of Assisted Reproductive Technology in Europe

Europe is the only continent where the legal regulation of ART is widespread. Other major countries where ART is used, such as India, Japan, and the U.S., largely rely on voluntary guidelines. While ART regulation is sometimes portrayed as a novel phenomenon, there is a long history of government interference in the reproductive realm. For example, countries have long had laws pertaining to marriage and divorce, contraception, births out of wedlock, adoption, and abortion (Spar 2005).

There are three major ways of regulating the practice of and the access to ART. First, ART can be regulated via *guidelines*, or sets of rules that practitioners are expected to follow voluntarily. These guidelines are generally issued by professional organizations, such as associations of obstetricians and gynaecologists. Second, as an alternative or a supplement to these guidelines, ART is also often subject to governmental *legislation*. Thus, rules for using ART are codified in the law, and penalties for the violation of these rules are imposed. A third route that regulates access to ART is *insurance coverage*: given the high cost of infertility treatments, the level of coverage can be seen as an indirect regulation of access to ART. However, because infertility is now seen as a condition leading to disability (WHO and World Bank 2011), infertile individuals should have a right to treatment.

The International Federation of Fertility Societies (IFFS) provides information on ART guidelines, regulations, and insurance coverage in their triennial

"Surveillance Reports," which have been published since 1999 (Jones and Cohen 1999). The data in these reports are based on surveys of experts from national fertility societies. The IFFS data are organized into relatively broad categories, and are sometimes incomplete or inconsistent. Nonetheless, these reports provide a useful overview of the differences in ART governance across Europe. In the following, we present data from the most recent IFFS Surveillance Report (Ory et al. 2014), which refers to the year 2013. We include all of the European countries featured in the report, plus a number of contrasting non-European cases.

The left column of Table 14.1 reveals that in all European countries, ART is regulated under the law. In about half of the countries, governmental regulation is supplemented by voluntary guidelines. By contrast, for two of the three non-European cases listed at the bottom of the Table (India and Japan), ART is fully governed by voluntary guidelines. While the distinction between legislation and guidelines does not reveal the scope and extent of the actual regulation, it roughly illustrates how important ART is to the respective government. The second column shows that ART legislation is a salient issue for governments, as half of the countries have introduced new ART legislation in the relatively short period of 4 years.

When it comes to the financing of ART treatments, virtually all European countries offer some assistance. Only Belarus, Ireland, and Switzerland do not provide their citizens with any form of coverage. Whereas most countries provide coverage via national health plans, some mandate that private insurers provide coverage. Six countries—Denmark, France, Hungary, Russia, Slovenia, and Spain—offer complete coverage through national health plans. A comparison with the results from Fig. 14.1 reveals that Denmark, Slovenia, and Spain are among the countries with particularly high ART utilization rates. In the countries where partial coverage is provided, the extent of the coverage varies considerably. For example, two-thirds of the costs are covered by the national health system in Austria, but only 40 % of the costs are covered in Finland. Furthermore, the level of insurance coverage usually depends on patient characteristics. In Spain, for example, coverage is only available for women up to age 40. Slovenia covers six cycles for the first child and four cycles after a first live birth, but only for women up to age 42. In some parts of the United Kingdom, women who are obese are being denied coverage. In the U.S., there is substantial heterogeneity in coverage across the states, with a few states providing rather generous coverage, and the vast majority providing no coverage.

Couple and sexuality requirements represent a socially relevant aspect of ART policies, as they govern access to ART treatments over and above the financial restrictions that infertile couples and individuals face. Table 14.2 lists the couple and sexuality requirements, as reported by Ory et al. (2014) for all European countries and India, Japan, and the U.S. It should be noted that these requirements can stem from both legislation and guidelines. The first column of Table 14.2 reveals that marriage is a requirement for ART treatment in most countries. Only six out of 22 European countries in Table 14.2 report that marriage is not a requirement for ART access. However, apart from Turkey (and Japan), all of the European countries listed also provide treatment to couples who live in a stable relationship. Ory et al. (2014) acknowledged that "stable relationship" is a poorly defined concept open to

**Table 14.1** Types of ART regulation in Europe, India, Japan, and the U.S., 2013

| Country | Type of ART governance | New ART legislation since 2009 | Type of coverage | Extent of coverage |
|---|---|---|---|---|
| Austria | Legislation and guidelines | No | National health plan | Partial |
| Belarus | Legislation and guidelines | No | No coverage | None |
| Belgium | Legislation only | Yes | National health plan and private insurance | Partial |
| Bulgaria | Legislation only | Yes | National health plan | Partial |
| Croatia | Legislation only | Yes | National health plan and private insurance | Partial |
| Czech Republic | Legislation only | Yes | National health plan | Partial |
| Denmark | Legislation only | Yes | National health plan | Complete |
| Finland | Legislation only | No | National health plan | Partial |
| France | Legislation and guidelines | Yes | National health plan | Complete |
| Greece | Legislation only | No | National health plan | Partial |
| Hungary | Legislation only | No | National health plan | Complete |
| Iceland | Legislation only | No | National health plan | Partial |
| Ireland | Legislation and guidelines | No | No coverage | None |
| Italy | Legislation and guidelines | Yes | National health plan | Partial |
| Latvia | Legislation and guidelines | Yes | National health plan | Partial |
| Norway | Legislation and guidelines | No | National health plan | Partial |
| Portugal | Legislation only | Yes | National health plan | Partial |
| Russia | Legislation and guidelines | Yes | National health plan | Complete |
| Slovenia | Legislation only | No | National health plan | Complete |
| Spain | Legislation and guidelines | No | National health plan and private insurance | Complete |
| Sweden | Legislation and guidelines | No | National health plan | Partial |
| Switzerland | Legislation and guidelines | No | No coverage | None |
| Turkey | Legislation and guidelines | Yes | National health plan | Partial |
| United Kingdom | Legislation and guidelines | Yes | Private insurance | Partial |

(continued)

**Table 14.1** (continued)

| Country | Type of ART governance | New ART legislation since 2009 | Type of coverage | Extent of coverage |
|---|---|---|---|---|
| India | Guidelines only | No | No coverage | None |
| Japan | Guidelines only | No | National health plan | Partial |
| United States | Legislation and guidelines | No | Private insurance | Partial |

Source: Ory et al. (2014)

**Table 14.2** Couple and sexuality requirements for ART in Europe, India, Japan, and the U.S., 2013

| | Marriage required | Stable relationship permitted | Singles permitted | Lesbians permitted |
|---|---|---|---|---|
| Austria | Yes | Yes | No | No |
| Belgium | Yes | Yes | Yes | Yes |
| Bulgaria | Yes | Yes | Yes | Yes |
| Croatia | Yes | Yes | No | No |
| Czech Republic | Yes | Yes | No | No |
| Denmark | Yes | Yes | Yes | Yes |
| Finland | No | Yes | Yes | Yes |
| France | No | Yes | No | No |
| Greece | No | Yes | Yes | No |
| Hungary | Yes | Yes | Yes | No |
| Ireland | No | Yes | No | No |
| Italy | Yes | Yes | No | No |
| Latvia | Yes | Yes | Yes | Yes |
| Russia | Yes | Yes | Yes | No |
| Slovenia | No | Yes | No | No |
| Spain | Yes | Yes | Yes | Yes |
| Sweden | Yes | Yes | No | No |
| Switzerland | No | Yes | No | No |
| Turkey | Yes | No | No | No |
| United Kingdom | No | Yes | Yes | Yes |
| India | Yes | Yes | Yes | No |
| Japan | Yes | No | No | No |
| United States | No | Yes | Yes | Yes |

Source: Ory et al. (2014)

interpretation, yet it is widely embraced across countries. Countries are somewhat more restrictive in their rules regarding unpartnered women who want to undergo ART treatment. Only 10 of the 22 European countries, along with India and the U.S., permit singles to utilize ART services. Moreover, only seven European countries and the U.S. allow lesbian women to have access to ART.

To better illustrate how European countries vary in their approach to regulating forms of ART, we examine the particularly controversial ART variant of surrogacy. There are several forms of surrogacy (see the notes below Table 14.3). The most prominent form is a traditional variant that uses the surrogate mother's egg. By contrast, in gestational surrogacy, the egg is provided by the intended mother or a donor, fertilized via IVF, and then transferred to the surrogate mother's womb.

The first central difference between countries lies in whether they prohibit (Table 14.3, column 1) or heavily regulate surrogacy (Table 14.3, column 3). Surrogacy is prohibited in many countries, such as France, Germany, Italy, Spain, and Portugal. Surrogate motherhood is explicitly allowed in Belgium, Belarus, Denmark, Greece, Ireland, the Russian Federation, Ukraine, and the United Kingdom. A second difference refers to compensation of the surrogate mother. When surrogacy is permitted, in some countries the prospective parents are not allowed to pay the surrogate mother beyond covering her "altruistic costs." Conversely, commercial surrogacy is legal in certain U.S. states, as well as in India, Ukraine, and the Russian Federation. In countries where surrogacy is prohibited, stakeholders have produced evidence that prospective parents may travel to other countries that allow commercial surrogacy.[3] A third difference between countries relates to access to surrogacy. Since some countries require that both partners provide gametes when surrogates are used, singles are generally unable to have a child via surrogacy in these countries.

Finally, due to the frequent cross-border nature of surrogacy, highly contentious ethical and legal debates have arisen about the citizenship and parental rights of surrogate and adoptive parents. The media have recently reported numerous cases of babies who have been left without citizenship or parents. A famous case that demonstrates the legal problems that can arise is that of twins who were born to a gay male British couple, of whom one was the biological father, with the help of an anonymous egg donor and a Ukrainian surrogate mother (Henderson 2008). Because of conflicts between British and Ukrainian laws, the British father was not treated as a parent of the twins, and his children were not allowed to enter the United Kingdom. Conversely, the Ukrainian surrogate mother had waived all rights to custody of her biological offspring in a surrogacy agreement, which was, however, only recognized under Ukrainian law, and not under British law. In the end, the British couple were able to gain custody of the twins following a decision in a British court of law. Similar cases have been reported in Germany: for example, babies who were born outside of the country using surrogacy have been denied citizenship, even though the German parents were named on the birth certificate (The Local 2011). Concerns have been raised about the "Baby Gammy" case, in which a child with Down's syndrome who was born to a Thai surrogate mother was abandoned by the intended Australian parents. The child was recently granted Australian citizenship, and remains under the care of the Thai surrogate mother (Farrell 2015). The legal mechanisms for granting parenthood status remain unclear and differ depending on where the surrogate mother is located, or on a court's opinion regarding the best interests

[3] See, e.g., Surrogacy UK, http://www.surrogacyuk.org/

**Table 14.3** Overview of legal approaches to surrogacy, Europe and selected other countries, 2013

| | General prohibition | Commercial surrogacy allowed or prohibited? | Special law on surrogacy? | Adoption rules or recognition of citizenship of children from cross-border surrogacy |
|---|---|---|---|---|
| Austria | Egg donation prohibited; gestational surrogacy allowed | No specific prohibition for traditional surrogacy | No for traditional surrogacy | No recognition of child's citizenship |
| Belarus | Allowed | Unknown | Unknown | Unknown |
| Belgium | Allowed[b] | Prohibited on public policy grounds | No for altruistic surrogacy | Adoption required to transfer legal parenthood |
| Bulgaria | Prohibited | n/a | No, but draft legislation under consideration | n/a |
| Cyprus | Allowed | Allowed/no prohibition | Yes | Surrogate mother and biological father listed on birth certificate |
| Czech Republic | Allowed | Allowed/no prohibition | Yes | Unknown |
| Denmark | Allowed[b] | Prohibited | No for altruistic surrogacy | Adoption required to transfer legal parenthood |
| Estonia | Allowed | Allowed/no prohibition | Yes | Unknown |
| Finland | Prohibited for IVF | No specific prohibition for traditional surrogacy | No for traditional surrogacy | Unknown |
| France | Prohibited | n/a | n/a | Unknown |
| Germany | Prohibited | n/a | n/a | No recognition of child's citizenship |
| Greece | Allowed | Allowed/no prohibition | Yes: altruistic gestational surrogacy subject to restrictions | Surrogate mother and biological father listed on birth certificate |
| Hungary | Allowed | Prohibited | No for altruistic surrogacy | |

(continued)

**Table 14.3** (continued)

| | General prohibition | Commercial surrogacy allowed or prohibited? | Special law on surrogacy? | Adoption rules or recognition of citizenship of children from cross-border surrogacy |
|---|---|---|---|---|
| Ireland | Allowed[b] | Prohibited | No for altruistic surrogacy but formal guidelines for cross-border surrogacy agreements | Adoption required to transfer parents; genetic intended parents' names as legal parents on birth registry |
| Italy | Prohibited | n/a | n/a/ | Unknown |
| Latvia | Allowed | Prohibited | No for altruistic surrogacy | Unknown |
| Lithuania | Allowed | Allowed/no prohibition | Yes | Unknown |
| Luxembourg | Allowed | Allowed/no prohibition | Yes | Unknown |
| Malta | Prohibited | n/a | n/a | Unknown |
| Norway | Prohibited | n/a | No | |
| Netherlands | Allowed[b] | Prohibited | Yes altruistic gestational surrogacy required by law to abide by professional guidelines | No special law for parenthood: adoption required |
| Poland | Allowed | Allowed/no prohibition | Yes | Surrogate mother and biological father listed on birth certificate |
| Portugal | Prohibited | n/a | n/a | Unknown |
| Russian Fed. | Allowed | Allowed/no prohibition | Unknown | Unknown |
| Slovakia | Allowed | Allowed/no prohibition | Yes | Unknown |
| Slovenia | Allowed | Allowed/no prohibition | Yes | Unknown |
| Spain | Prohibited | n/a | n/a | Unknown |

(continued)

**Table 14.3** (continued)

| | General prohibition | Commercial surrogacy allowed or prohibited? | Special law on surrogacy? | Adoption rules or recognition of citizenship of children from cross-border surrogacy |
|---|---|---|---|---|
| Sweden | Prohibited for fertility clinics to make surrogacy arrangements | Prohibited | No law for privately arranged surrogacy; Swedish Council Medical Ethics recently recommended altruistic surrogacy should be permitted | Adoption required to transfer parenthood |
| Switzerland | Prohibited | n/a | n/a | No recognition of child's citizenship |
| Turkey | Prohibited | n/a | n/a | Unknown |
| Ukraine | Allowed | Allowed/no prohibition | Unknown | Intended parents' names on birth certificate |
| United Kingdom | Allowed[b] | Prohibited | No for altruistic surrogacy | Parenthood only transferred in certain circumstances |
| India | Allowed | Allowed/no prohibition | Yes | Parents' names on birth certificate, Indian surrogates cannot be named as mother |
| Japan | Prohibited | n/a | n/a | Unknown |
| Canada | Allowed[b] | Prohibited | Unknown | Unknown |
| United States | Allowed[a] | Allowed/certain prohibitions | Yes | Parents' names on birth certificate |

Notes: In traditional surrogacy, the surrogate mother is the genetic mother, as one of her eggs is inseminated using the sperm of the intended father or donated sperm (either IVF or insemination). In altruistic surrogacy, the surrogate mother is paid nothing or only enough to cover her expenses. In commercial surrogacy, the surrogate mother is paid a fee that may exceed her expenses

Source: Brunet et al. (2013), Ory et al. (2014), Families Thru Surrogacy (2015). When expert interviews from IFFS data from Ory et al. (2014) differed from legal and clinical survey data reported by Brunet et al. (2013), the latter data were adopted over the expert interviews

[a]Allowed in California, Maryland, Massachusetts, Ohio, Pennsylvania, South Carolina, Alabama, Arkansas, Connecticut, Illinois, Iowa, Nevada, North Dakota, Oregon, Tennessee, Texas, Utah, and West Virginia

[b]Allowed only for non-commercial surrogacy (i.e., the mother is not paid or is paid only enough to cover her expenses)

of the child. It appears that when many ART laws were initially written or amended, surrogacy was often excluded or barely acknowledged.

## 14.4 Cross-Border Reproductive Care in Europe

As we touched upon in our discussion on surrogate motherhood, the variation in regulations in Europe has given rise to the phenomenon of cross-border reproductive care (Shenfield et al. 2010; Nygren et al. 2010). Cross-border reproductive care refers to couples or individuals seeking assisted reproduction treatments in a country other than their country of permanent residence.[4] Although practitioners, patients, and policy-makers appear to be aware of this phenomenon, there is little empirical research on the actual extent of cross-border reproductive care. The review article by Hudson et al. (2011) tellingly reported that the number of commentaries on the topic greatly exceeds the number of empirical studies.

So far, researchers have been unable to generate reliable estimates of the incidence of cross-border reproductive care. The most ambitious attempt to conduct a global survey of this form of care was by Nygren et al. (2010), who collected information from experts in 23 countries. Virtually all of the reports were based on estimates by informants rather than empirical data, and the authors concluded that their efforts yielded "little, if any, solid data" on cross-border reproductive care. The estimates of Nygren et al. suggest that most cross-border reproductive care in Europe involves traveling to other European countries, not to other continents.

The largest study of patients undergoing cross-border reproductive care in Europe was conducted in 2008/09 by Shenfield et al. (2010). They surveyed all women from other countries who were undergoing treatment in 44 fertility clinics in Belgium, the Czech Republic, Denmark, Switzerland, Slovenia, and Spain. The main countries of origin of the women seeking care were Italy (32 %), Germany (15 %), the Netherlands (12 %), and France (9 %). Geographic and cultural proximity is a driving factor in the choice of treatment country: the majority of Italians traveled to Spain and Switzerland, most of the Germans traveled to the Czech Republic, the majority of the Dutch and French women went to Belgium, and most of the Norwegian and Swedish women traveled to Denmark. Shenfield and colleagues suggest that a conservative estimate of cross-border reproductive care (i.e., crossing country borders in order to undergo ART) in 2008/2009 would be one of 11,000–14,000 patients and 24,000–30,000 treatment cycles in the six countries alone. When confronted with the number of ART cycles (2008: 532,000; 2009: 537,000) counted in all of Europe at that time (Ferraretti et al. 2012; Ferraretti et al. 2013), this is a small, yet substantial share of patients and cycles.

[4] This phenomenon is also sometimes referred to as "reproductive tourism" or "reproductive exile" (Pennings 2005), but given the charged nature of both terms, we follow Shenfield et al. (2010) in their use of the more descriptive and neutral term "cross-border reproductive care."

The reasons for seeking cross-border reproductive care are diverse, with patients reporting a combination of factors (Culley et al. 2011). The main reasons cited were legal restrictions, difficulties in accessing ART treatments (e.g., long waiting lists), the expectation of better quality treatment in the destination country, and the failure of previous treatments in the patient's country of origin. A number of studies have described the legal reasons why ART patients seek treatment in other countries. For example, egg donation is a form of assisted reproduction that is banned in some European countries, including Germany. Thus, some German couples travel to the Czech Republic or Spain for egg donation (Bergmann 2011). In France, single women and lesbian couples lack access to donor sperm (see Table 14.2). Thus, these women sometimes travel to Belgium to seek treatment (van Hoof et al. 2015; Rozée Gomez and de La Rochebrochard 2013). Certain countries, like the United Kingdom, have long waiting lists for donor gametes, and patients who wish to avoid lengthy waiting periods seek treatment in countries where donor gametes are more readily available (Culley et al. 2011). These long waiting periods have arisen for a number of reasons. For example, some countries (e.g., Finland, Sweden, and the United Kingdom) have banned anonymous gamete donation, which tends to discourage donation. There is also considerable variation across countries in the amounts donors are paid. Patients from countries such as Italy hope to receive better quality treatments abroad (Zanini 2011; Shenfield et al. 2010), while other patients go abroad because the previous treatments they received in their country of residence failed (Shenfield et al. 2010; Culley et al. 2011). In their comparative study of patients seeking treatment abroad, Shenfield and colleagues (2010) found evidence that supports the assumption that differences in regulations are important drivers of cross-border fertility care. Between 57 and 80 % of patients from Italy, Germany, Norway, France, and Sweden cited legal restrictions as one of the reasons why they were seeking fertility treatment abroad. By contrast, only 32 % of patients from the Netherlands and 9 % of patients from the United Kingdom cited legal barriers. However, 53 % of patients from the Netherlands reported that they went abroad to obtain better quality treatment (compared to an average of 43 % across the six countries surveyed), while 34 % of the patients from the United Kingdom said they went abroad because of access difficulties (compared to an average of 7 % across the six countries surveyed).

While the extent to which European patients cross borders to obtain reproductive care appears to be limited, cross-border care has far-reaching consequences and implications for ART regulation, access, and treatment success rates. Because it is relatively easy and inexpensive for Europeans to travel across borders to obtain care, the value of legal restrictions on ART is largely symbolic (van Beers 2015). Furthermore, as patients can easily circumvent national regulations by seeking treatment abroad, patient groups and other national stakeholders may have reduced incentives to make their interests known in the policy-making process. This lack of pressure allows policy-makers to impose more onerous restrictions than they would have if they had been facing more resistance from stakeholders (Storrow 2010). Furthermore, cross-border reproductive care has implications for equity of access to ART. Rozée Gomez and de la Rochebrochard (2013) have reported that lower

income French patients seek fertility treatment in Greece for financial reasons. This might in turn affect access to ART within Greece, as local patients might be "priced out" of the market for ART services.

## 14.5 Discussion

This study has shown that there is marked variation in ART usage levels across Europe, and that the highest levels are not just in affluent countries such as Denmark and Belgium, but also in Slovenia, the Czech Republic, Estonia, and Serbia. The reasons for this variation include affordability, reimbursement levels, and the social and cultural norms surrounding childbearing. A striking shift has been the move away from IVF as the dominant form of ART, and toward ICSI, a method used primarily to treat male infertility. We also show that the mix of treatments used varies across countries.

Currently, all of the European countries have laws on ART, and virtually all (with the exception of Belarus, Ireland, and Switzerland) provide some sort of financial assistance for treatments. The countries where the cost of treatments is completely covered by national health plans—such as Denmark, Slovenia, and Spain—have the highest ART utilization rates. Coverage also differs by patient characteristics, such as the age of the prospective mother and how many children she already has. In many countries, patients who seek ART treatments must be legally married or in a stable partnership. Currently only half of European countries permit single women to have ART treatments, and even fewer countries grant access to lesbian women.

We also looked at the increasingly relevant issue of surrogacy and cross-border reproductive care. Surrogacy is strictly prohibited in many countries, and where it is allowed, there are often restrictions on commercial surrogacy. Due to the frequent cross-border nature of surrogacy, there is considerable confusion about which laws apply when determining the citizenship of the child and the parental rights of the surrogate and the adoptive parents. The growth in cross-border reproductive care means that restrictive national regulations can be easily circumvented, but it raises questions about equity of access. Cross-border reproductive care is a transnational phenomenon that forces social scientists and policy-makers to think beyond the confines of the nation-state (Mau and Verwiebe 2010; Wimmer and Glick Schiller 2002). Notwithstanding all of the problems related to patients crossing borders to achieve fertility treatment, it is important to acknowledge that women have been crossing borders in Europe for a long time to abort pregnancies, exploiting country differences in reproductive legislation.

Recently, there has been a rise in the uptake of techniques such as the "social freezing" of eggs, and it has even been suggested that ART could help countries raise their fertility levels. However, we would be reluctant to argue that it is an upcoming policy to reconcile career and family aspirations, such as measures that encourage flexible work schedules (Präg and Mills 2014) or improve access to public childcare (Mills et al. 2014). Because ART treatments tend to have low success

rates at higher ages, they cannot be expected to reverse the "biological clock" (Präg et al. 2015; Wyndham et al. 2012).

This study also showed some strong limitations in what we are able to conclude, which is due to the lack of data about ART in Europe. In the future, researchers should first attempt to standardize the collection of data on ART treatments and their outcomes, as this would improve our knowledge of the individual antecedents and effects of ART. Second, researchers should develop national databases to collect quantitative information that can be linked across countries, as cross-border reproductive care needs to be properly registered. Third, we need these initiatives to not only monitor cross-border reproductive care in Europe, but also to support caregivers in providing help for patients both undergoing and returning from cross-border fertility care in these often legally diffuse situations.

Although Europe is currently the biggest market for ART in the world, it is important to note that the demand for ART is relatively low in Europe. Paradoxically, involuntary childlessness is most prevalent (and is perceived by infertile women as most pressing) in Africa, where fertility levels are the highest in the world. Given the increasing international recognition of the problem and the push for the low-cost provision of ART (Ombelet 2014), the "globalization of ART" has yet to be achieved (Inhorn and Patrizio 2015).

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## Literature

Adamson, G. D., Tabangin, M., Macaluso, M., & de Mouzon, J. (2013). The number of babies born globally after treatment with the assisted reproductive technologies (ART). *Fertility and Sterility, 100*, S42.

Benagiano, G., & Gianaroli, L. (2010). The Italian constitutional court modifies Italian legislation on assisted reproduction technology. *Reproductive Biomedicine Online, 20*, 398–402.

Bergmann, S. (2011). Reproductive agency and projects. Germans searching for egg donation in Spain and the Czech Republic. *Reproductive Biomedicine Online, 23*, 600–608.

Billari, F. C., Goisis, A., Liefbroer, A. C., Settersten, R. A., Aassve, A., Hagestad, G., et al. (2011). Social age deadlines for the childbearing of women and men. *Human Reproduction Update, 26*, 616–622.

Boulet, S. L., Mehta, A., Kissin, D. M., Warner, L., Kawwass, J. F., & Jamieson, D. J. (2015). Trends in use of and reproductive outcomes associated with intracytoplasmic sperm injection. *JAMA, 313*, 255–263.

Brunet, L., Carruthers, J., Davaki, K., King, D., Marzo, C., & McCandles, J. (2013). *A comparative study on the regime of surrogacy in EU member states*. Brussels: European Parliament.

Chambers, G. M., Hoang, V. P., Sullivan, E. A., Chapman, M. G., Ishihara, O., Zegers-Hochschild, F., et al. (2014). The impact of consumer affordability on access to assisted reproductive technologies and embryo transfer practices. *Fertility and Sterility, 101*, 191–198. e194.

Culley, L., Hudson, N., Rapport, F., Blyth, E., Norton, W., & Pacey, A. A. (2011). Crossing borders for fertility treatment. Motivations, destinations, and outcomes of UK fertility travelers. *Human Reproduction Update, 26*, 2373–2381.

Families Thru Surrogacy. (2015). *Surrogacy by country*: http://www.familiesthrusurrogacy.com/surrogacy-by-country. Accessed 20 Aug 2015.

Farrell, P. (2015, January 19). Baby gammy, born into Thai surrogacy scandal, granted Australian citizenship. *The Guardian*. http://www.theguardian.com/australia-news/2015/jan/20/baby-gammy-born-into-thai-surrogacy-scandal-granted-australian-citizenship. Accessed 20 Aug 2015.

Ferraretti, A. P., Goossens, V., de Mouzon, J., Bhattacharya, S., Castilla, J. A., Korsak, V., et al. (2012). Assisted reproductive technology in Europe, 2008. Results generated from European registers by ESHRE. *Human Reproduction Update, 27*, 2571–2584.

Ferraretti, A. P., Goossens, V., Kupka, M., Bhattacharya, S., De Mouzon, J., Castilla, J. A., et al. (2013). Assisted reproductive technology in Europe, 2009. Results generated from European registers by ESHRE. *Human Reproduction Update, 28*, 2318–2331.

Greene, M. E., & Biddlecom, A. E. (2000). Absent and problematic Men. Demographic accounts of male reproductive roles. *Population and Development Review, 26*, 81–115.

Hamilton, B. H., & McManus, B. (2012). The effects of insurance mandates on choices and outcomes in infertility treatment markets. *Health Economics, 21*, 994–1016.

Henderson, M. (2008, December 12). British surrogacy ruling saves baby twins from Ukraine orphanage. *The Times*. http://www.thetimes.co.uk/tto/law/article2212834.ece. Accessed 20 Aug 2015.

Hudson, N., Culley, L., Blyth, E., Norton, W., Rapport, F., & Pacey, A. (2011). Cross-border reproductive care. A review of the literature. *Reproductive Biomedicine Online, 22*, 673–685.

Inhorn, M. C., & Patrizio, P. (2015). Infertility around the globe. New thinking on gender, reproductive technologies, and global movements in the 21st Century. *Human Reproduction Update, 21*, 411–426.

Jones, H. W., Jr., & Cohen, J. (1999). IFFS Surveillance 1998. *Fertility and Sterility, 71*, S1–S34.

Kocourkova, J., Burcin, B., & Kucera, T. (2014). Demographic relevancy of increased use of assisted reproduction in European countries. *Reproductive Health, 11*, 37.

Kohler, H.-P., Billari, F. C., & Ortega, J. A. (2002). The emergence of lowest-low fertility in Europe during the 1990's. *Population and Development Review, 28*, 641–680.

Kupka, M. S., Ferraretti, A. P., De Mouzon, J., Erb, K., D'Hooghe, T., Castilla, J. A., et al. (2014). Assisted reproductive technology in Europe, 2010. Results generated from European registers by ESHRE. *Human Reproduction Update, 29*, 2099–2113.

Malizia, B. A., Hacker, M. R., & Penzias, A. S. (2009). Cumulative live-birth rates after In Vitro fertilization. *New England Journal of Medicine, 360*, 236–243.

Mascarenhas, M. N., Flaxman, S. R., Boerma, T., Vanderpoel, S., & Stevens, G. A. (2012). National, regional, and global trends in infertility prevalence since 1990. A systematic analysis of 277 health surveys. *Plos Medicine, 9*, e1001356.

Mau, S., & Verwiebe, R. (2010). *European societies. Mapping structure and change*. Bristol: Policy.

Mertes, H., & Pennings, G. (2011). Social egg freezing. For better, not for worse. *Reproductive Biomedicine Online, 23*, 824–829.

Mills, M., & Präg, P. (2015). *Norms, politics, and assisted reproductive technology (ART) policies. A cross-national comparative analysis*. Paper presented at the annual meeting of the population association of America, San Diego.

Mills, M., Rindfuss, R. R., McDonald, P., & te Velde, E. (2011). Why do people postpone parenthood? Reasons and social policy incentives. *Human Reproduction Update, 17*, 848–860.

Mills, M., Präg, P., Tsang, F., Begall, K., Derbyshire, J., Kohle, L., et al. (2014). *Use of childcare services in the EU member states and progress towards the Barcelona targets*. Brussels: European Commission DG Justice.

Nyboe Andersen, A., Carlsen, E., & Loft, A. (2008). Trends in the use of intracytoplasmatic sperm injection. Marked variability between countries. *Human Reproduction Update, 14*, 593–604.

Nygren, K., Adamson, D., Zegers-Hochschild, F., & de Mouzon, J. (2010). Cross-border fertility care. International committee monitoring assisted reproductive technologies global survey. 2006 data and estimates. *Fertility and Sterility, 94*, e4–e10.

Ombelet, W. (2014). Is global access to infertility care realistic? The Walking Egg project. *Reproductive Biomedicine Online, 28*, 267–272.
Ory, S. J., Devroey, P., Banker, M., Brinsden, P., Buster, J., Fiadjoe, M., et al. (2014). IFFS surveillance 2013. Preface and conclusions. *Fertility and Sterility, 101*, 1582–1583.
Palermo, G. D., Joris, H., Devroey, P., & Van Steirteghem, A. C. (1992). Pregnancies after intracytoplasmic injection of single spermatozoon into an oocyte. *Lancet, 340*, 17–18.
Pennings, G. (2005). Reproductive exile versus reproductive tourism. *Human Reproduction Update, 20*, 3571–3572.
Präg, P., & Mills, M. (2014). *Family-related working schedule flexibility across Europe*. Brussels: European Commission DG Justice.
Präg, P., Mills, M., Tanturri, M. L., Monden, C., & Pison, G. (2015). *The demographic consequences of assisted reproductive technologies*: Deliverable D4.6 of 'Families and Societies'.
Rozée Gomez, V., & de La Rochebrochard, E. (2013). Cross-border reproductive care among French patients. Experiences in Greece, Spain, and Belgium. *Human Reproduction Update, 28*, 3103–3110.
Shenfield, F., de Mouzon, J., Pennings, G., Ferraretti, A. P., Nyboe Andersen, A., de Wert, G., et al. (2010). Cross-border reproductive care in six European countries. *Human Reproduction Update, 25*, 1361–1368.
Simpson, J. L. (2010). Preimplantation genetic diagnosis at 20 years. *Prenatal Diagnosis, 30*, 682–695.
Sobotka, T. (2010). Shifting parenthood to advanced reproductive ages. Trends, causes and consequences. In J. C. Tremmel (Ed.), *A young generation under pressure? The financial situation and the "rush hour" of the cohorts 1970–1985 in a generational comparison* (pp. 129–154). Berlin: Springer.
Spar, D. (2005). Reproductive tourism and the regulatory map. *New England Journal of Medicine, 352*, 531–533.
Steptoe, P. C., & Edwards, R. G. (1978). Birth after the reimplatation of a human embryo. *Lancet, 312*, 366.
Storrow, R. F. (2010). The pluralism problem in cross-border reproductive care. *Human Reproduction Update, 25*, 2939–2943.
te Velde, E. R., & Pearson, P. L. (2002). The variability of female reproductive ageing. *Human Reproduction Update, 8*, 141–154.
te Velde, E. R., Habbema, D., Leridon, H., & Eijkemans, M. (2012). The effect of postponement of first motherhood on permanent involuntary childlessness and total fertility rate in six European countries since the 1970's. *Human Reproduction Update, 27*, 1179–1183.
The Local. (2011, April 28). Surrogate children have no right to German Passport, Court Rules. *The Local*. http://www.thelocal.de/20110428/34681. Accessed 20 Aug 2015.
Tran, M. (2014, October 15). Apple and Facebook offer to freeze eggs for female employees. *The Guardian*. http://www.theguardian.com/technology/2014/oct/15/apple-facebook-offer-freeze-eggs-female-employees. Accessed 20 Aug 2015.
van Beers, B. C. (2015). Is Europe 'Giving in to Baby Markets?' Reproductive tourism in Europe and the gradual erosion of existing legal limits to reproductive markets. *Medical Law Review, 23*, 103–134.
van Hoof, W., Pennings, G., & de Sutter, P. (2015). Cross-border reproductive care for law evasion. A qualitative study into the experiences and moral perspectives of French women who go to Belgium for treatment with donor sperm. *Social Science and Medicine, 124*, 391–397.
WHO, World Bank. (2011). *World report on disability*. Geneva: WHO.
Wimmer, A., & Glick Schiller, N. (2002). Methodological nationalism and beyond. Nation-state building, migration, and the social sciences. *Global Networks, 2*, 301–334.
Wyndham, N., Marin Figueira, P. G., & Patrizio, P. (2012). A persistent misperception: Assisted reproductive technology can reverse the 'aged biological clock.'. *Fertility and Sterility, 97*, 1044–1047.
Zanini, G. (2011). Abandoned by the state, betrayed by the church. Italian experiences of cross-border reproductive care. *Reproductive Biomedicine Online, 23*, 565–572.

Zegers-Hochschild, F., Adamson, G. D., de Mouzon, J., Ishihara, O., Mansour, R., Nygren, K. G., et al. (2009). International committee for monitoring assisted reproductive technology (ICMART) and the World Health Organization (WHO) revised glossary of ART terminology, 2009. *Fertility and Sterility, 92*, 1520–1524.

Zegers-Hochschild, F., Mansour, R., Ishihara, O., Adamson, G. D., de Mouzon, J., Nygren, K. G., et al. (2014). International committee for monitoring assisted reproductive technology. World report on assisted reproductive technology, 2005. *Fertility and Sterility, 101*, 366–378.



# Part V
# Consequences of Childlessness