Comparative Population Studies – Demographic Trends Around the Globe
Vol. 50 (2025): 183-204 (Date of release: 16.09.2025)

Cross-border Reproductive Care in Czechia: Insights from National Registry Data

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Abstract: Cross-border reproductive care (CBRC) represents a growing component of assisted reproductive technologies (ART), particularly in Europe. This article presents a descriptive, register-based analysis of CBRC in Czechia, focusing on the volume of ART cycles, the countries of origin of patients, and treatment types in comparison with domestic patients.

We analysed 176,588 ART cycles recorded in the Czech National Registry of Assisted Reproduction (NRAR) between 2016 and 2019. Patients were classified by country of residence, nationality, and insurance status. Descriptive statistics were used to identify patterns in terms of patient characteristics and treatment choices. The analysis was contextualised with reference to national ART legislation in selected source countries.

The findings revealed that nearly 40 percent of ART cycles in Czechia are attributable to CBRC, making the country one of Europe's leading destinations for cross-border fertility treatment. The largest groups of CBRC patients are from Germany, Italy, Slovakia, the UK, France, Serbia, Ireland, and Hungary. Women who seek CBRC in Czechia are significantly older than their Czech counterparts, with a modal age of 41 years compared to 38 years, respectively, for IVF/ICSI cycles and 43 years compared to 38 years, respectively, for cycles in which a woman receives donated eggs. Moreover, the treatment preferences of CBRC patients differ markedly: they are more likely to undergo frozen embryo transfer (FET) cycles (37 percent vs. 30 percent among Czech patients) and egg receipt (OoR) cycles (32 percent vs. 3 percent among Czech patients).

The study provides a unique, data-driven perspective on the dynamics of cross-border reproductive care in Czechia, drawing on comprehensive national registry data. By identifying key source countries and differences in treatment preferences, it highlights Czechia's growing role in the European reproductive care landscape and sheds light on how legal, demographic, and economic conditions shape cross-border patient mobility in Europe.

Keywords: Assisted reproduction · Cross-border reproductive care · Availability of ART · Egg donation · Czechia

URL: www.comparativepopulationstudies.de
DOI: https://doi.org/10.12765/CPoS-2025-12
URN: urn:nbn:de:bib-cpos-2025-12en

1 Introduction

As a consequence of fertility postponement, which has represented the prevailing trend of economically advanced countries over the last several decades (*Frejka* 2017; *Frejka et al.* 2008), the time available for reproduction has been significantly shortened, and the risk of infertility has increased given that the probability of natural conception decreases with increasing age (*Baird et al.* 2005; *Crawford/Steiner* 2015). The World Health Organization (WHO) classifies infertility as a disease of the female or male reproductive system – defined by the inability to achieve pregnancy after 12 months or more of regular unprotected sexual intercourse – requiring appropriate investigation and treatment (*WHO* 2020). Infertility treatment via assisted reproductive technology (ART), a widely used method for infertile persons to realise their reproductive intentions , has resulted in the birth of more than 10 million children worldwide (*ESHRE* 2022).

Access to ART is regulated by legislation in a number of countries and the differing degree of availability is seen as a major reason why many infertile couples and individuals seek infertility treatment abroad (*Präg/Mills* 2017a; *Salama et al.* 2018). *Pennings* (2009) describes the significant diversity of ART legislation across Europe as a "legal mosaicism". Although most countries base their legislation on broadly shared ethical principles such as the value of life, child welfare, and clinical safety, there is significant divergence in how they rank these values. As a result, national policies often diverge or are even in conflict. For instance, while some countries restrict the number of embryos transferred so as to reduce health risks, others (e.g. Germany and Italy) impose stricter limits on embryo manipulation due to the elevated moral status assigned to embryos in vitro, even at the cost of an increased risk of multiple gestation (*Pennings* 2009).

The process of providing fertility services to patients who travel outside their home country for treatment is referred to as cross-border reproductive care (CBRC) (*Dostálová/Güell* 2022; *ESHRE* 2017). The factors that contribute to CBRC are very diverse and encompass many different desires and motivations (*Martin* 2016). "Push" factors include restrictive policies in certain countries that prohibit or limit access to specific ART interventions, long waiting times to start fertility treatment (usually due to a lack of gamete donors), previous treatment failure, or the risk of stigma in the patient's home country (*Dostálová/Güell* 2022; *Jacobson* 2020; *Präg/Mills* 2017a). *Inhorn/Patrizio* (2009) mention also the desire of infertile couples and persons to protect their privacy as one of the "push" factors for CBRC, since infertility treatment is often a psychologically challenging and sensitive issue. Conversely, "pull" factors include permissive policies, cheaper treatment, safe high-quality medical care, and a high success rate of ART (*Dostálová/Güell* 2022; *Jacobson* 2020; *Salama et al.* 2018). While the push and pull model provides a useful framework, it only partially captures the complexity of patient decision-making. Factors such as language, cultural proximity, clinic branding and preferences related to ethnicity and kinship also play an important role, as highlighted in recent qualitative research (*Knecht et al.* 2012; *Präg/Mills* 2017b).

Although CBRC has become increasingly important in Europe over the last few years and the number of people seeking fertility treatment abroad is increasing steadily, no reliable data is available on the exact extent of this relatively new phenomenon (*Salama et al.* 2018). A 2006 survey of ART registries in 18 countries estimated that CBRC may account for up to 10 percent of all initiated IVF and ICSI cycles (*Collins/Cook* 2010). *Shenfield et al.* (2010) estimated the extent of CBRC in 2008 and 2009 in six European countries (Belgium, Czechia, Denmark, Switzerland, Slovenia, and Spain) at 11,000 to 14,000 patients and 24,000 to 30,000 cycles per year. However, given the dynamic nature of the ART sector, these results provide only a very approximate indication of the volume and nature of cross-border reproductive care today.

Czechia, together with Spain, Belgium, and Denmark have been identified in many studies as the principal CBRC destination countries in Europe (e.g. *Pennings et al.* 2009; *Shenfield et al.* 2010; *Bergmann* 2011; *Speier* 2011; *Rozée Gomez/De La Rochebrochard* 2013; *Adrian/Kroløkke* 2018; *Salama et al.* 2018; *Dostálová/Güell* 2022). Moreover, Czechia evinced the highest ART uptake rate of these countries in 2019, i.e. over 3.6 thousand cycles per million population (*Smeenk et al.* 2023). The aim of this article is, therefore, to analyse the current numbers and characteristics of women who receive CBRC in Czechia and to contribute to the overall understanding of the CBRC phenomenon. This study is based on the quantitative analysis of individual-level register data covering all ART cycles conducted in Czechia. Rather than aiming to capture the personal experiences and motivational factors of patients, it attempts to identify empirical patterns in terms of the uptake of cross-border treatment. The specific aims are to a) identify the source countries of those who receive CBRC in Czechia, b) determine the differences in the use of ART between women from Czechia and foreign women who undertake CBRC in Czechia, c) identify the differences in the types of ART used by women from various countries, and d) discuss the factors that cause the significant differences in ART uptake.

The key contribution of the paper concerns the use of unique anonymised individual level data on all ART cycles initiated in Czechia. The article benefits from the obligatory full reporting of ART cycles initiated in Czechia in 2016, which allowed the identification of cycles undergone by women who are not residents of Czechia (*IHIS CR* 2022). The article focuses on the period 2016-2019, prior to the Covid-19 pandemic and the introduction of anti-pandemic restrictive measures that affected both travel and the provision of medical services.

1.1 ART in Czechia – regulation and conditions

Czechia is one of the few European countries that recorded a significant increase in ART use immediately following the introduction of ART legislation and registration in 1997 (*Kocourková et al.* 2023). Importantly, Czechia was also the first country in the former Eastern Bloc to achieve a successful IVF birth, with the first "test tube baby" being born in 1982 (*Chmel/Čekal* 2020). This early development laid the foundations for a strong clinical tradition and the normalisation of IVF within Czech society.

In Czechia, live births following ART accounted for more than 3.5 percent of all the country's live births in 2017-2020 (*Kocourková et al.* 2023). The internationally reported proportion of 5.5 percent (*Wyns et al.* 2022) of ART births in Czechia overestimates the impact of ART on the number of births in the country due to the inclusion of women who receive cross-border reproductive care.

The high uptake of ART is also reflected in the increase in the number of assisted reproduction centres, of which there are currently 48 in Czechia, the highest number in Europe proportional to population (*IHIS CR* 2022; *Kocourková et al.* 2023). Liberal legislation allowing all ART interventions plays an important role in this respect, as do the availability of suitable gamete donors (with the condition of anonymity), the high quality of medical care and the low cost of ART. One IVF cycle with the application of the woman's own eggs usually costs between 2,400 and 3,000 EUR *(Kocourková et al.* 2023).

ART can only be performed in Czechia following the submission of a written request from the woman and the man, and the woman must be no older than 49 years. ART has been accessible to unmarried heterosexual couples since 2006 (Act No. 227/2006 Coll.). Although single women and homosexual couples remain legally excluded from infertility treatment, a number of qualitative studies have shown that this condition can be circumvented since the woman is not obliged to register the man who provided consent for ART at the clinic as the father of the child following the birth. Therefore, lesbian and single women also undergo ART, while gay men use surrogacy, which is not regulated in Czechia (*Hašková* 2022; *Hašková/Sloboda* 2018). Gametes can only be donated anonymously, and the donor must be over 18 years of age and no older than 35 years of age for egg donors and 40 years for sperm donors (*Řežábek* 2014).

The 1997 Act introduced health insurance coverage for up to three IVF cycles for women aged 22-39, and from the age of 18 for women with bilateral fallopian tube obstruction (Act No. 48/1997 Coll.). Three IVF cycles with embryo transfer have been covered since 2012, and if only one embryo was transferred in the first two cycles, a fourth cycle is also covered (*GHIC CR* 2022; *Kocourková et al.* 2015). Following an amendment to legislation, the age limit in Czechia for the reimbursement of IVF from the public health insurance system was raised by one year to 40 years from 1 January 2022; however, the age limit of 39 years was valid for the whole of the period considered by this study.

2 Data and methods

We employed a set of anonymised individual-level data on all ART cycles as reported in the National Registry of Assisted Reproduction (NRAR), which is administered by the Institute of Health Information and Statistics of the Czech Republic (IHIS CR). A total of 176,588 ART cycles initiated in Czechia between 2016 and 2019 were included in the analysis. The reporting of data on ART cycles has been mandatory for all reproductive centres since 2006. However, only since 2016 has it been possible to track CBRC reliably following the expansion of the information collected to include

the country of current residence and the nationality of the women. The registry distinguishes six main types of ART cycles:

- IVF/ICSI cycle: a cycle involving in vitro fertilisation, either via conventional IVF or intracytoplasmic sperm injection (ICSI). The resulting embryos belong to the couple that request their creation, regardless of whether their own or donated gametes (eggs or sperm) are used.
- FET cycle (frozen embryo transfer): a cycle in which previously frozen embryos from an earlier IVF cycle are thawed and transferred.
- ED cycle (egg donation): a cycle in which a woman donates her eggs to another couple. The donor's cycle is recorded separately and concludes with the number of eggs retrieved.
- OoR cycle (oocyte/egg receipt): a cycle in which a woman receives donated eggs.
- EmR cycle (embryo receipt): a cycle in which a woman receives an embryo that was originally created for the treatment of another couple but later donated.
- FREEZ cycle: a cycle intended for the preservation of fertility via the freezing of eggs or embryos without immediate transfer (*IHIS CR* 2022).

Each ART cycle in the registry includes both mandatory and optional data fields. The mandatory data, which ensures full coverage and validity, include the woman's nationality, country of residence, type of cycle, and whether the cycle was covered by Czech public health insurance. Optional data comprises data that is not legally required and which may be inconsistently reported. Of this data, the variable "completed age of the woman" was included in the analysis since it was available for all the cases reported. Other optional fields – such as whether a clinical pregnancy was achieved or whether the woman had been pregnant previously – were excluded due to their irrelevance to the aims of the research. The variables employed allowed for a total of 176,588 observations, with no missing data. In order to distinguish between domestic and cross-border ART cycles, we applied three key variables available in the NRAR dataset: the woman's country of residence and nationality, and whether the cycle was covered by Czech public health insurance. The variable for insurance coverage refers specifically to eligibility for statutory coverage, which applies to Czech residents under the age of 39.[1]

For the purposes of this analysis, a cycle was classified as CBRC only if all three of the following conditions were met simultaneously: (1) the woman's country of residence was outside Czechia, (2) she was not a Czech citizen, and (3) the cycle was not covered by Czech public health insurance. This strict definition was adopted so as to ensure a high level of certainty when identifying cross-border cases. Women who met at least one of the following criteria – residing in Czechia, holding Czech citizenship, or being covered by public insurance – were classified as domestic patients (hereinafter referred to as "natives"). All three of the classification variables

[1] The public health insurance system in Czechia covered a maximum of 4 IVF cycles up to the woman's 39th birthday.

were complete for the entire dataset; thus, no cases had to be excluded due to missing information. The country from which the woman arrived in Czechia for infertility treatment was identified based on the "country of current residence of the woman" variable. The analysis focused on those countries from which most women arrived for CBRC and which, together, accounted for three-quarters of the total volume of CBRC provided in Czechia.

The ART cycles were analysed separately for natives and other women seeking CBRC with descriptive statistics. The differences in the uptake of ART were examined in terms of both age and country of residence. The second part of the analysis places the data on CBRC in Czechia into the context of legislative and other conditions governing the provision of infertility treatment in all the countries studied.

3 Results

3.1 Identification of the source countries of CBRC provided in Czechia

Between 2016 and 2019, a total of 176,588 ART cycles were initiated in Czechia. The maximum number was recorded in 2019 (46,580 cycles). The proportion of cycles undergone by women seeking CBRC increased from 36.5 percent in 2016 to 38.3 percent in 2019.

Almost 30 percent of CBRC in Czechia between 2016-2019 was provided for women whose registered current residence was in Germany (Table 1). In terms of the total volume of reproductive care provided in Czechia, every tenth ART cycle was provided for women resident in Germany. Italy was the second most important source country for CBRC in Czechia with a share of more than 10 percent of CBRC and 4 percent of the total volume of ART performed in Czechia. The other countries included in the ranking evinced lower, though still significant, proportions of CBRC:

Tab. 1: Countries with the highest proportions of CBRC provided in Czechia by number and proportion of ART cycles of total CBRC and total ART care provided, 2016-2019

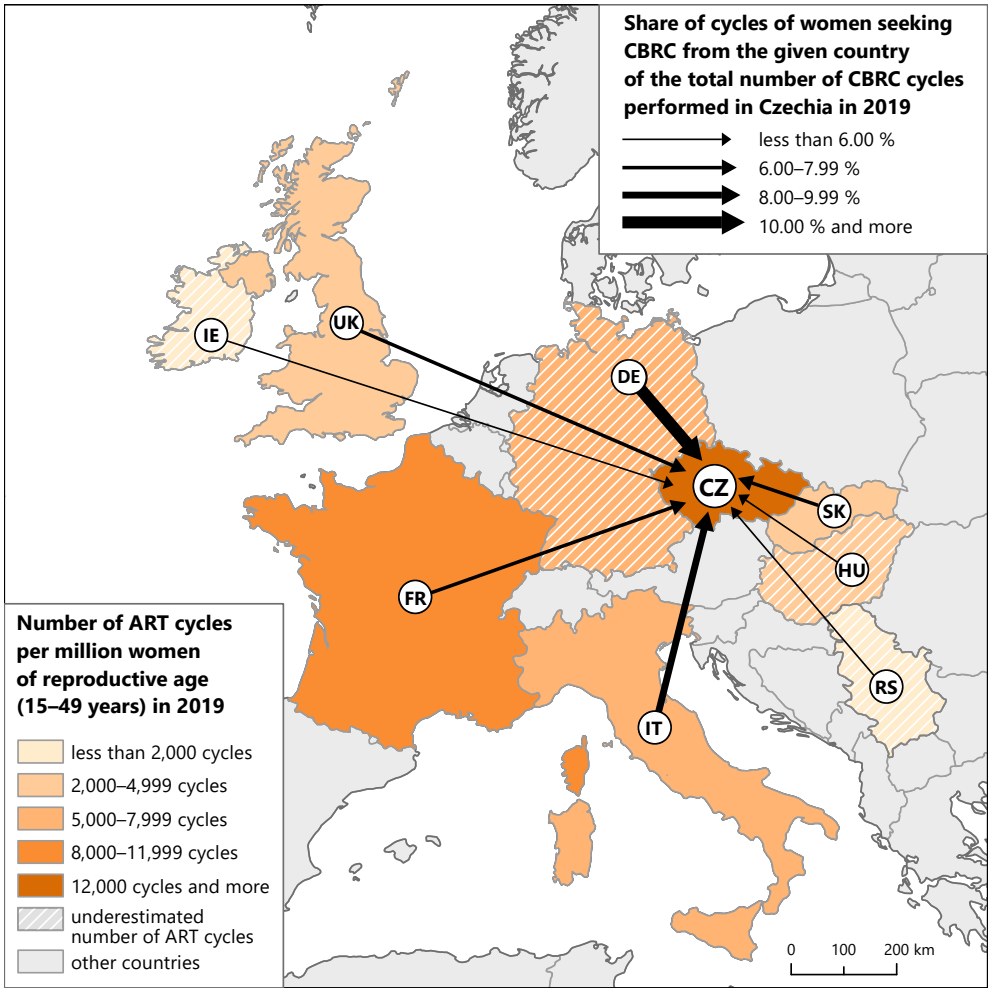
Order	Country	Number of cycles	Proportion of CBRC cycles (%)	Proportion of all cycles initiated in Czechia (%)
1.	Germany	19,736	29.9	11.2
2.	Italy	6,890	10.4	3.9
3.	Slovakia	5,071	7.7	2.9
4.	United Kingdom	4,486	6.8	2.5
5.	France	4,410	6.7	2.5
6.	Serbia	4,171	6.3	2.4
7.	Ireland	2,931	4.4	1.7
8.	Hungary	2,219	3.4	1.3

Source: NRAR 2016-2019, authors' calculations

Slovakia (7.7 percent of total CBRC), the UK (6.8 percent), France (6.7 percent), Serbia (6.3 percent), Ireland (4.4 percent), and Hungary (3.4 percent) (Table 1).

Other source countries, not considered to be major source countries for the purposes of this article, each accounted for less than 3 percent of CBRC in Czechia in 2016-2019. They included the USA and the European countries of Austria, Romania, Switzerland, Poland, and Croatia.

Fig. 1: Intensity of CBRC in Czechia and ART uptake in the source countries, 2019



Note: Data for four countries on the number of ART cycles per one million women aged 15-49 is underestimated since not all ART centres report data to the national registry. In Germany, data is available from 133 of 139 ART centres; in Hungary 11 of 14 centres; in Ireland 2 of 9 centres; and in Serbia 6 of 18 centres.

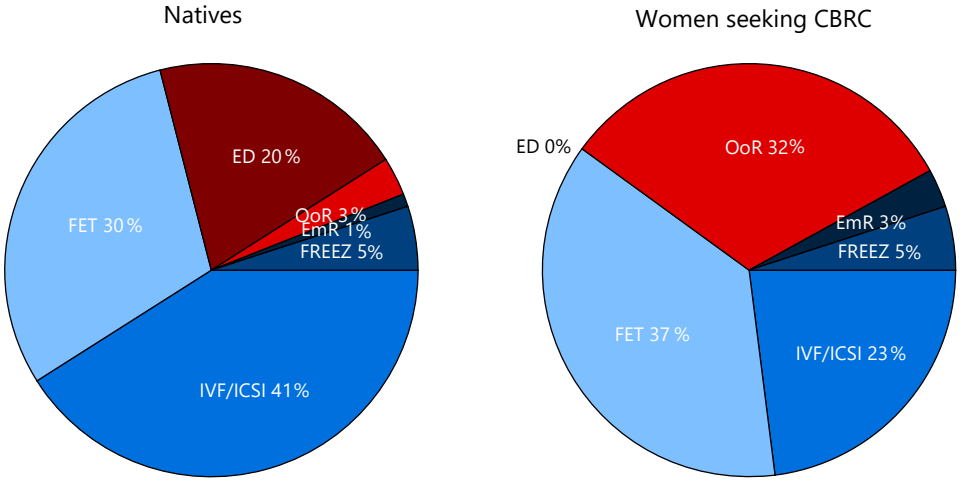
Source: *NRAR 2016-2019*, *Smeenk et al.* (2023), authors' calculations

The intensity of CBRC from the perspective of Czechia as a destination country and the use of ART in the source countries (defined as the number of ART cycles initiated per one million women aged 15-49) in 2019 is shown in Figure 1. In comparison to Czechia, with over 16,000 ART cycles initiated per one million women of reproductive age, all the other countries evinced less intense uptake of ART in 2019. Specifically, France recorded over 8,000 ART cycles per one million women of reproductive age, while Italy and Germany each reported over 6,000 cycles. Utilisation in Slovakia and the United Kingdom was even lower, with just over 4,000 ART cycles per one million women of reproductive age. However, the data for Germany was slightly underestimated since only 133 of a total of 139 German ART centres provided the necessary data (*Smeenk et al.* 2023). Similarly, data from some other countries including Hungary, Ireland, and Serbia was also underreported due to incomplete submissions from ART centres (*Smeenk et al.* 2023).

3.2 CBRC in Czechia by the age of women and type of ART cycle

The ART cycle structure differed markedly between natives and women seeking CBRC (Fig. 2) during the period studied. For natives, the highest proportion of cycles initiated in 2016-2019 related to IVF/ICSI cycles (41 percent) with fresh transfer, followed by frozen embryo transfer (FET, 30 percent) and egg donation (20 percent). In contrast, women who sought CBRC most often chose FET cycles (37 percent) and cycles involving the receipt of donated eggs (32 percent), which together accounted for the majority of cycles initiated with respect to CBRC in Czechia.

Fig. 2: Structure of ART cycles by the type of cycle performed in Czechia in 2016–2019



Source: *NRAR 2016-2019*, authors' calculations

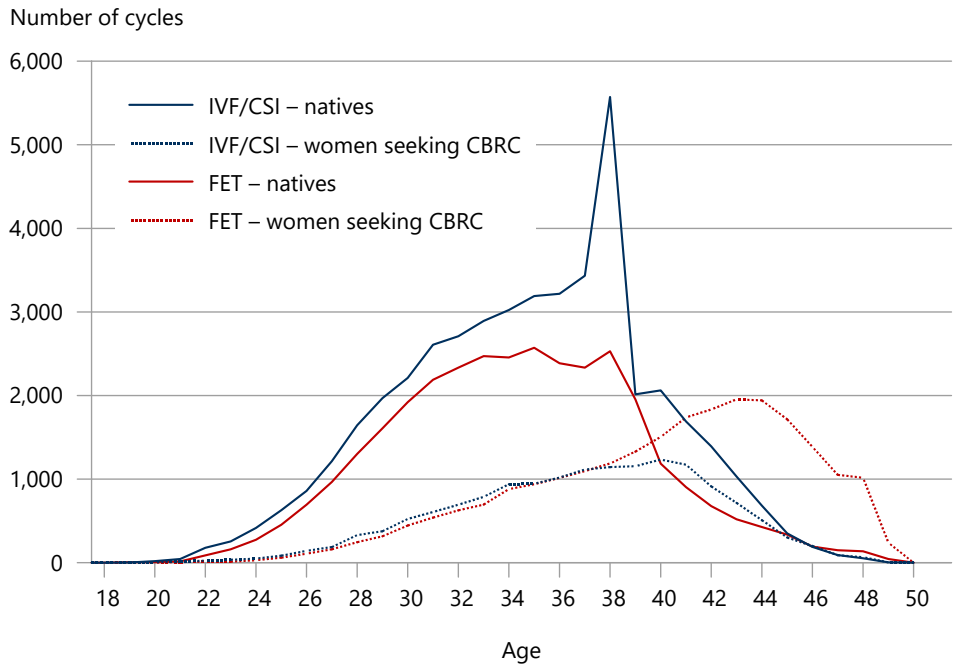
Since age is a key factor in infertility treatment, Figure 3 shows the distribution of IVF/ICSI and FET cycles initiated in Czechia by the age of the women between 2016 and 2019. Natives generally underwent IVF/ICSI at younger ages, with a modal age of 38, which reflected the public health insurance age limit of 39; their uptake rate dropped sharply after this age. In contrast, women seeking CBRC had a modal age of 41 at the initiation of the treatment.

In addition, the age structure with concern to FET cycles differed markedly. FET uptake by natives tended to be concentrated at younger ages, with a bi-modal distribution of 35 and 38 years and a steep decline after 39, whereas FET cycles peaked at 43 years for CBRC patients, with the highest uptake occurring after the age of 40.

Between 2016 and 2019, egg donation (ED) in Czechia relied predominantly on native women as donors, typically at younger ages, due to the legal donor age limit of 35 (Fig. 4). ED cycles refer to procedures undertaken by women who donate their eggs and do not include the recipients of donated eggs. As foreign women almost never act as donors in the Czech ART system, the number of ED cycles among CBRC patients is negligible.

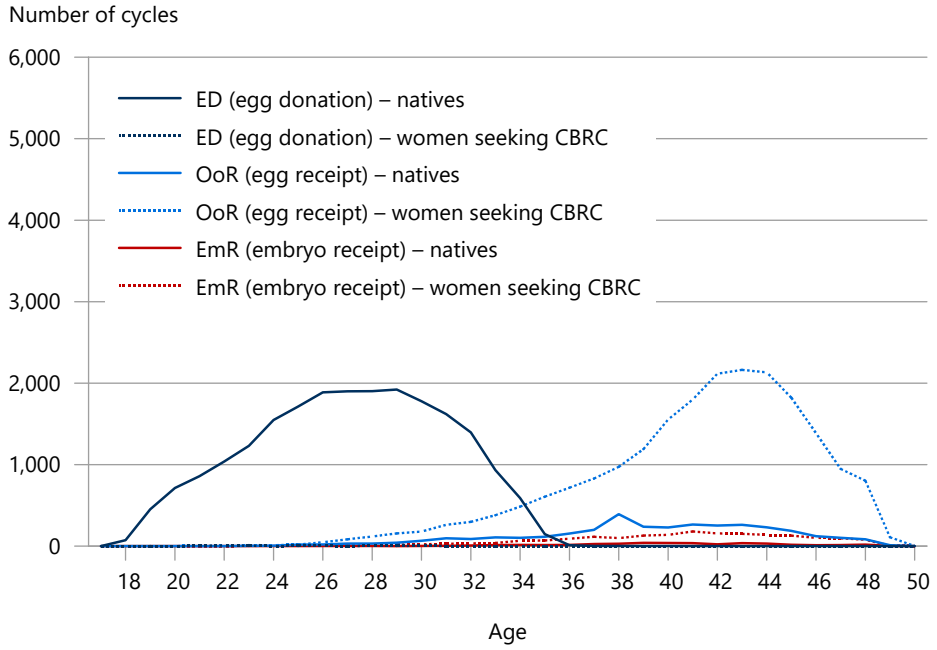
In contrast, egg receipt (OoR) cycles were predominantly initiated for CBRC patients, mainly at older ages, peaking at the age of 43 (2,100 cycles). Regarding

Fig. 3: Number of IVF/ICSI and FET cycles initiated in Czechia by the age of the woman; natives and women seeking CBRC, 2016-2019



Source: *NRAR 2016-2019*, authors' calculations

Fig. 4: Number of ED, OoR and EmR cycles initiated in Czechia by the age of the woman, natives and women seeking CBRC, 2016-2019



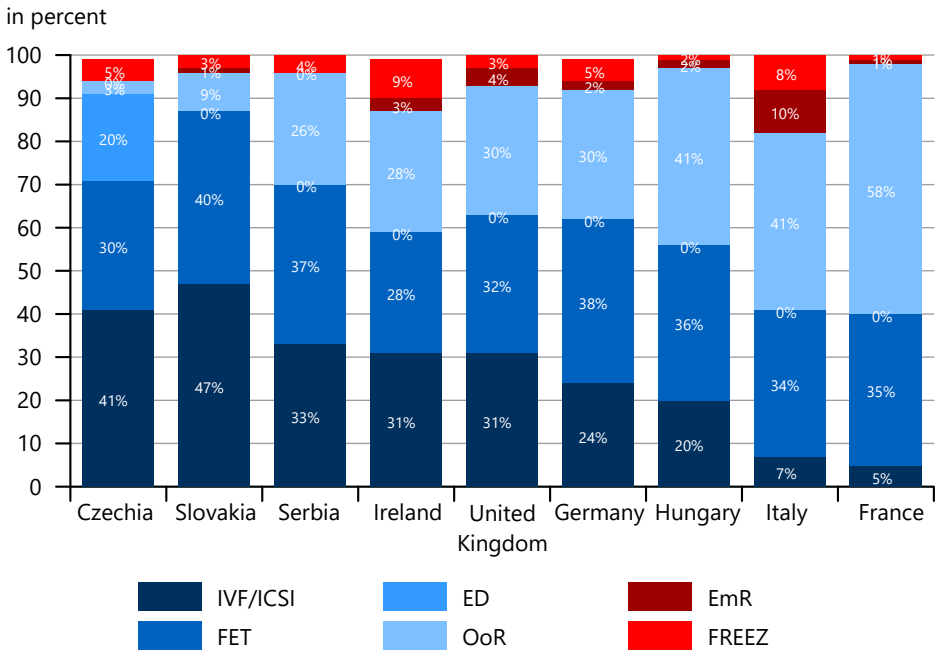
Source: *NRAR 2016-2019*, authors' calculations

Number of ED, OoR and EmR cycles initiated in Czechia by the age of the woman, natives and women seeking CBRC, 2016-2019 natives, OoR cycles were less frequent and occurred earlier, with a modal age of 38, thus reflecting public insurance eligibility rules. Embryo receipt (EmR) cycles were also mainly received by CBRC patients, with a peak of 180 cycles at the age of 41.

Figure 5 shows the structure of ART cycles in Czechia according to the CBRC source countries and the type of cycle that women from these countries underwent in Czechia in 2016-2019. The structure of the cycles initiated by women from Slovakia was most similar to that of natives, with IVF/ICSI (47 percent) and FET (40 percent) cycles dominating. The proportion of IVF/ICSI cycles initiated by women from Serbia, Ireland, and the UK was lower, just one third of those performed for natives, while egg receipt cycles (OoR) were initiated significantly more frequently, accounting for one-quarter to one-third of cycles initiated by women from these countries.

The women who received ART in Czechia via third-party reproduction originated principally from Italy and France (Fig. 5, right side of the graph). Egg-receipt (OoR) cycles constituted the dominant proportion of cycles for women from France (58 percent), Italy and Hungary (both 41 percent). Moreover, concerning women from Italy, every tenth cycle initiated in Czechia comprised embryo receipt cycles (EmR cycle, 10 percent). Therefore, more than half of cycles performed for women from France and Italy consisted of third-party reproduction.

Fig. 5: Structure of ART cycles in Czechia by CBRC source country and type of ART cycle, 2016-2019



Source: *NRAR 2016-2019*, authors' calculations

3.3 Legislation and ART funding in the countries studied

The uptake of ART and, thus, the intensity of CBRC, is largely influenced by the regulation of ART in the home country. With the exception of Ireland, as of 2021 all the countries studied had passed legislation regulating the use of ART *(FE/EPF* 2021*)*. In Ireland, the legal framework remains limited to non-binding ethical guidelines issued by the Irish Medical Council. The creation of human life for experimental purposes and cloning is prohibited, and clinics are not required to report treatment outcomes or publish success rate statistics (*McDermott et al.* 2022). Of the countries studied, Czechia, Germany, Italy, the United Kingdom, France, and Hungary have introduced national ART registers. Only Germany, Slovakia, and the UK have introduced national donor registers (*FE/EPF* 2021).

Table 2 provides information on access to IVF/ICSI using own and donated gametes or embryos for all the countries studied in 2019. The UK had the most liberal legislation and allowed IVF/ICSI with donated sperm, eggs or embryos, and donated gametes (the application of donated sperm and eggs at the same time) irrespective of the sexual orientation or marital status of patients.

In contrast, Germany had in place relatively strict ART regulations in 2019. It did not allow egg donation; therefore IVF/ICSI using donated eggs was illegal in Germany at the time. Access to IVF/ICSI with donated gametes was banned in France

Tab. 2: Legal conditions for access to IVF/ICSI and embryo donation in Czechia and in the considered CBRC countries in 2019

Access to IVF/ICSI and embryo donation	Czechia	Germany	Italy	Slovakia	UK	France	Serbia	Ireland	Hungary
With own gametes									
Heterosexual couples	YES	YES	YES	YES	YES	YES	YES	YES	YES
With sperm donation									
Heterosexual couples	YES	YES	YES	YES	YES	YES	YES	YES	YES
Female couples	NO	YES	NO	NO	YES	NO*	NO	YES	NO
Male couples	NO	NO	NO	NO	YES	NO	NO	NO	NO
Single women	NO	YES	NO	NO	YES	NO*	YES	YES	YES
With egg donation									
Heterosexual couples	YES	NO	YES	YES	YES	YES	YES	YES	YES
Female couples	NO	NO	NO	NO	YES	NO*	NO	YES	NO
Male couples	NO	NO	NO	NO	YES	NO	NO	NO	NO
Single women	NO	NO	NO	NO	YES	NO*	NO	YES	YES
With gametes donation (donated eggs and sperm at the same time)									
Heterosexual couples	YES	NO	YES	YES	YES	NO	NO	YES	YES
Female couples	NO	NO	NO	NO	YES	NO	NO	YES	NO
Male couples	NO	NO	NO	NO	YES	NO	NO	NO	NO
Single women	NO	NO	NO	NO	YES	NO	NO	YES	YES
With embryo donation									
Heterosexual couples	YES	YES	NO	YES	YES	YES	YES	YES	YES
Female couples	NO	NO	NO	NO	YES	NO*	NO	YES	NO
Male couples	NO	NO	NO	NO	YES	NO	NO	NO	NO
Single women	NO	NO	NO	NO	YES	NO*	YES	YES	NO

* The Bioethics Law, which allows lesbian couples and single women to undergo IVF/ICSI, has been in force in France since 2021.

Source: *Calhaz-Jorge et al.* (2020), *FE/EPF* (2021), authors' design

and Serbia in 2019, although sperm and egg donation was legal in both countries. Embryo donation, and therefore the transfer of donated embryos, was prohibited in Italy in 2019.

Regarding the restriction of access to ART to selected groups of people, only heterosexual couples were allowed to undergo ART in 2016-2019 in Czechia, Italy, and Slovakia. In France, ART was made available only to lesbian couples and single women in 2021 following the adoption of the Bioethics Act (*Library of Congress* 2021). Thus, ART was available only to heterosexual couples in France during the study period.

The UK, where ART was available to single women and lesbian couples, as well as gay couples during the period under study, was the exception in terms of legislation. Ireland also had relatively liberal legislation; in addition to heterosexual couples, single women and lesbian couples had access to IVF/ICSI. Due to the egg donation ban, single women and lesbian couples in Germany could only benefit from IVF or ICSI using donated sperm in 2016-2019. ART was also available to single women in Serbia and Hungary during the reporting period.

The public funding of ART varies considerably across the countries considered and directly affects access to treatment (Table 3). In 2019, all the countries studied except Ireland provided at least partial public coverage for infertility treatment, though under differing eligibility rules.

In most countries, up to three ART cycles were funded; Czechia covered a fourth provided only single embryo transfers were used, while Hungary financed up to five cycles. Strict age limits applied in Germany and Czechia (up to 39 years), whereas Slovakia applied no age cap, and Italy allowed reimbursement up to the age of 46.

Tab. 3: Public funding for ART and indicative prices for self-payers in Czechia and the CBRC source countries studied, 2019

Country	All available treatment covered?	Maximum number of ART cycles financed	Age limit for funding for women (in years)	IVF cycle price for self-payers (in EUR)
Czechia	NO	3*	<39**	2,800
Germany	YES	3	<39	3,500
Italy	YES	3	<46	6,000
Slovakia	NO	3	none	2,300
UK	NO	***	***	7,000
France	YES	4	<43	4,200
Serbia	YES	3	<42	2,700
Ireland	/	/	/	5,200
Hungary	YES	5	<45	3,300

* If single embryo transfers were performed in the first two cycles, 4 cycles are covered;
** Valid as of 2019, from 2022 the age limit was increased to 40 years;
*** According to a NICE decision. The prices quoted are indicative only and valid as of 2022; they refer to an IVF cycle with embryo transfer (i.e. without donated sperm or eggs).

Source: *Calhaz-Jorge et al.* (2020), *Wiecki* (2023), authors' design

Treatment costs for self-paying patients also varied. The lowest prices for one IVF cycle (without donor gametes) were identified for Slovakia, Czechia and Serbia (EUR 2.3-2.8k), while the highest were identified for Italy, the UK and Ireland.

4 Discussion

Czechia has established itself as one of the main destinations for CBRC in Europe. Nearly 40 percent of the total ART provided in the country is attributable to women seeking infertility treatment outside their home country. Germany (30 percent of all CBRC), followed by Italy (10 percent), Slovakia (8 percent), the UK (7 percent), France (7 percent), Serbia (6 percent), Ireland (4 percent) and Hungary (3 percent) were identified as the main source countries for CBRC provision in Czechia in 2016-2019; together, these countries accounted for 75 percent of the total volume of CBRC provided in the country. The results are thus partly consistent with those of an older study by *Shenfield et al.* (2010), who identified Germany, the UK, France, and Italy as the main countries in terms of CBRC provided in Czechia in 2008-2009. A decade later, Slovakia, Serbia, Ireland, and Hungary had also become important source countries for the reproductive care sector in Czechia. Therefore, one of the most important contributions of this paper concerns the identification of Central and Eastern European countries as important sources of CBRC in the European context. Women who undergo CBRC in Czechia are on average significantly older than natives and generally select different types of treatment compared to their Czech counterparts. The main factors that attract foreign patients include the legal and economic conditions that support the recruitment of egg donors under an anonymous framework, the absence of legislative barriers, the high quality of medical care, the relatively lower cost of treatment, and easy geographical and cultural accessibility.

Trends generally concerning the use of ART in Czechia are influenced significantly by the provision of CBRC. The increase in the use of ART up to 2019 was the result of growing interest from natives and from women seeking CBRC, whose proportion on ART use in Czechia increased from 36 percent in 2016 to 38 percent in 2019. Our results on the increasing attractiveness of Czechia as a CBRC destination country are in line with those of the *IHIS CR* (2021), which documents the increasing interest of foreign women in infertility treatment in Czechia as evidenced by the growth in the number of ART centres in the country (*IHIS CR* 2022). A comparison of the volume of CBRC provided in Czechia with other CBRC target countries is difficult since only old estimates based on patient follow-up are available. For example, it was reported that approximately 2,000 foreign patients sought fertility treatment in Belgium in 2007, which represented approx. 15 percent to 20 percent of all patients (*Pennings et al.* 2009). However, no up-to-date detailed data on CBRC is currently available on European countries.

One of the most important structural differences between natives and women seeking CBRC concerns their distinctly different age structures. Foreign women who undergo infertility treatment in Czechia are significantly older across all treatment

methods. While the majority of natives use ART before the age of 40, constrained by the age limit for the reimbursement of certain types of treatment by the health insurance system, the use of ART by women seeking CBRC increases after the age of 40 years and peaks at around 44 years. Thus, it is likely that some women choose to seek fertility treatment in Czechia based on previous treatment failure or after exhausting/losing eligibility for ART funding from public health insurance in their home country (*Dostálová/Güell* 2022; *Präg/Mills* 2017a).

The availability of the full range of treatment methods and the relatively low cost of ART compared to other European countries comprise two of the most important factors in terms of the attractiveness of Czechia for infertility treatment and the combination of favourable factors overall renders Czechia attractive for patients from abroad (*Donchin* 2010). Additionally, Czech clinics enjoy a competitive advantage on the European market for these services. Many provide high-quality care and boast high success rates (*Salama et al.* 2018). Moreover, targeted marketing campaigns and specialised ART centres with foreign language speakers who assist in the organisation of treatment specifically targeted to foreign patients reduces potential barriers to treatment for foreigners. In this regard, the CBRC assisted reproduction segment is very much a successful business (*Patrizio et al.* 2022).

The highest proportion (30 percent) of CBRC in Czechia between 2016-2019 was provided for women with a registered current residence in Germany. One of the most important factors in the choice of Czechia as a destination for infertility treatment for German women concerns the fact that Germany bans egg donation. Although the research indicates that the acceptance of treatment using donated eggs is relatively low among Germans, one in ten women who are in principle open to medical procedures for achieving a biological child would consider this treatment (*Haug/Milewski* 2018). Czechia is preferred due to the availability of donated eggs (*Calhaz-Jorge et al.* 2020; *Dostálová/Güell* 2022), as confirmed by the high proportion of OoR and FET cycles performed in general in the CBRC sector, particularly for German women. A further important factor in the choice of Czechia for German women seeking CBRC most likely concerns the geographical and/or cultural proximity of the two countries as noted by *Bergmann* (2011) or *Präg/Mills* (2017b).

Legislative conditions regarding access to certain treatment options in the source country may additionally explain the attractiveness of Czechia for women from Italy, France, and Hungary. The cryopreservation of embryos, and therefore embryo donation/reception, is prohibited in Italy (*Calhaz-Jorge et al.* 2020). Italian women seeking CBRC are more likely to undergo embryo receipt cycles (10 percent of ART cycles were for Italian women) in Czechia than women from other countries. Furthermore, Italians generally opt for the OoR and FET methods, as do women from Germany. The choice of Czechia may also be related to the fact that it is a more secularised country than Italy; in this respect *Szalma/Djundeva* (2020) or *Haug/Milewski* (2018) point out the link between religiosity and negative social attitudes to ART.

The structure of the ART cycles selected by women from France further points to a preference for donated egg cycles. *Rozée Gomez/De La Rochebrochard* (2013) identified French CBRC patients primarily as same-sex couples, single women who

are not eligible for ART in France[2] and heterosexual couples that seek egg donation due to the extremely limited access to egg donation in France. While *Rozée Gomez/ De La Rochebrochard* (2013) originally identified Greece, Belgium, and Spain as primary destinations, our data indicates a growing preference for Czechia, including for third-party treatment approaches such as egg and embryo donation.

In this context, it is important to consider not only legal accessibility but also the economic conditions that shape oocyte donation practices. While the availability of anonymous donation in Czechia remains a central pull factor, the financial dimension deserves further attention. Compared to countries such as the UK, where only limited compensation is available, Czech clinics offer higher remuneration despite lower national income levels (*Dostálová/Güell* 2022; *Ventruba et al.* 2021). This most likely contributes to the greater availability of donor eggs and the overall success in terms of recruiting donors. Notably, Czechia lacked a national donor register during the study period, and no significant political initiatives towards tighter regulation appear to have emerged since. Feminist scholars have long drawn attention to the fact that egg donation, as a physically demanding procedure, is often undertaken primarily for financial compensation rather than altruistic motives (*Vertommen et al.* 2022).

Although some of the countries studied allow egg donation, they face a shortage of donors due to non-anonymous donation conditions. The UK provides a good example, where according to *Wyns et al.* (2022) patients have to wait several months to start any treatment requiring donated sperm or donated eggs. In contrast, Czech ART centres had no shortage of donors between 2016-2019, due most probably to the anonymity of donation, which renders it impossible to reveal the identity of the donor to potential offspring. This factor was likely driving up to one-third of the cycles initiated by UK patients opting for the acceptance of donated eggs in the studied period.

Non-anonymous donation is also allowed in Ireland, whereas Hungary has a mixed anonymous and non-anonymous donation system, where the egg donor must be a relative of the recipient, while the sperm donor remains anonymous (*Calhaz-Jorge et al.* 2020). However, the condition of a family relationship with the egg donor significantly limits the potential for Hungarian women to undergo donated egg treatment (*Szalma/Takács* 2022). As a result, 40 percent of cycles commenced by Hungarian women in Czechia comprise donated egg receipt cycles.

Women who travel for treatment from Slovakia demonstrate the most similar patterns of ART use compared to natives. Although the foreign literature does not mention Slovakia as a source country, it accounted for almost 8 percent of the CBRC provided in Czechia between 2016 and 2019. According to *FE/EPF* (2021), Slovakia does not maintain an ART activity register; therefore, no data on ART use is available. Although Slovakia lags behind Czechia in terms of ART centre capacity, Slovak women do not seek CBRC in Czechia due to restrictive regulations at home. The

[2] France's Bioethics Law allows lesbian couples and single women to undergo IVF/ICSI since 2021. This did not apply during the study period.

countries do not differ in their ART policies (*Calhaz-Jorge et al.* 2020), as evidenced by the similarity in the structure of the ART cycles chosen (most frequently IVF/ICSI and FET cycles). The probable reasons for the choice of Czechia as a destination country for Slovaks concern the cultural proximity of the two countries, which, until 1992, formed a single state, the absence of a language barrier and the high quantity of personal ties between their respective residents.

The availability of individual anonymised data provided a unique opportunity for the detailed analysis of CBRC provided in Czechia both from the point of view of the structural differences between the patients as a whole and through the identification of key source CBRC countries. This article shows that Czechia is one of the most important countries in Europe in terms of the volume of CBRC provided. In addition to the countries traditionally mentioned in studies of cross-border infertility treatment, we discovered that a significant proportion of women travel from Slovakia, Serbia, and Hungary, expanding on earlier findings regarding cross-border CBRC in Czechia. In addition, we highlighted the significant extent to which the legislative regulations relating to infertility treatment in the source countries influence the type of treatment that women who receive treatment abroad require. The older age structure of foreign patients indicates that CBRC in Czechia is often seen as a final option following the failure of treatment in the home country.

The data employed in this analysis have limitations. The data reported to the national registry concerns cycles rather than patients. Thus, if a woman underwent multiple ART cycles in one year, she is listed more than once in the register (*IHIS CR* 2022). The absence of a unique indicator for patients from abroad renders it impossible to link data per cycle to individual women. Hence, the available data does not allow for monitoring whether and in what volume women seeking CBRC return to Czechia repeatedly, or whether and how the treatment methods they use change. Moreover, due to the structure of the register, the analysis lacks information on patients' personal, cultural, and economic motivations, as well as on the characteristics of donors or outcomes beyond cycle-level indicators. These limitations prevent extrapolation to patient decision-making processes or the conditions under which reproductive materials and labour are mobilised.

Despite these limitations, the study provides the first large-scale, registry-based analysis of cross-border reproductive care in Czechia. It contributes to a better understanding of the demographic and regulatory drivers of patient mobility and reveals how Czechia has become a key reproductive care destination for diverse groups of foreign patients within Europe.

Authors' contributions

Conceptualisation and design of the research: J. Kocourková, A. Volejníková and A. Šťastná. Data acquisition: J. Kocourková and A. Šťastná. Methodology: A. Volejníková, J. Kocourková and A. Šťastná. Formal analysis: A. Volejníková. Interpretation of the data and writing of the original draft: A. Volejníková. Writing-reviewing and editing: A. Šťastná and J. Kocourková. Manuscript revision for important intellectual content:

A. Volejníková, J. Kocourková and A. Šťastná. All authors read and approved the final manuscript.

Acknowledgements
This paper was supported by the Czech Science Foundation (No. 21-31691S) through the "Demographic consequences of assisted reproduction in Czechia" project, and by the NPO "Systemic Risk Institute", ref. number LX22NPO5101, funded by the European Union – Next Generation EU (Ministry of Education, Youth and Sports, NPO: EXCELES). We also thank our colleague Dr. Luděk Šídlo for drawing the cartogram.

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Date of submission: 21.01.2025 *Date of acceptance: 24.07.2025*

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Comparative Population Studies

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ISSN: 1869-8980 (Print) – 1869-8999 (Internet)

Published by
Federal Institute for Population Research (BiB)
65180 Wiesbaden / Germany

E-mail: cpos@bib.bund.de