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# Cross-border reproductive care among French patients: experiences in Greece, Spain and Belgium

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**STUDY QUESTION:** What are the characteristics, motivation and experience of French patients seeking cross-border reproductive care (CBRC)?

**SUMMARY ANSWER:** French patients seeking CBRC are same-sex couples, single women who are not eligible for assisted reproduction technologies (ARTs) in France and heterosexual couples seeking oocyte donation due to extremely limited access to this technique in France, while their choice of Greece as a destination is influenced by financial issues.

**WHAT IS KNOWN ALREADY:** CBRC is a new, increasing, complex and poorly understood phenomenon. A few studies have investigated UK, German or Italian CBRC patients, but none have specifically investigated French patients although France is one of the top four countries of origin of CBRC patients in Europe.

**STUDY DESIGN, SIZE, DURATION:** A cross-sectional study was carried out in 2010–2012 in three ART centres in Greece, Belgium and Spain in order to investigate French patients treated in these centres. Recruitment was prospective in Greece and Belgium and retrospective in Spain. The overall response rate was 68%, with 128 French patients participating.

**PARTICIPANTS/MATERIALS, SETTING, METHODS:** French patients filled in a questionnaire. Information was collected on their socio-economic characteristics and their search for ART treatment in France and in other countries.

**MAIN RESULTS AND THE ROLE OF CHANCE:** In the Belgian centre, 89% of French patients used sperm donation whereas oocyte donation was used by 100% of patients in the Greek centre and 74% of patients in the Spanish centre. The majority (94%) of French patients using sperm donation in Belgium were not legally eligible for access to ART in France as they were same-sex couples or single women, and the main criterion of choice of centre was its geographical proximity (71%). Most of the French patients using oocyte donation in Greece and Spain fulfilled criteria for fully reimbursed oocyte donation treatment in France as they were heterosexual couples (99%) with the woman aged $<43$ years (65%). For these couples, CBRC was motivated by the extremely limited access to oocyte donation in France. Half of French CBRC patients using oocyte donation in Spain had a low/intermediate occupational level (such as primary school teachers, nurses, administrative officers or sales agents, workers and employees) and this proportion was much higher in Greece (82%, $P < 0.01$).

**LIMITATIONS, REASONS FOR CAUTION:** Larger and more wide-ranging studies are needed as this study included only 128 patients who may not be representative of all French CBRC patients, especially because the study was carried out only in three ART centres and these too may not be representative.

**WIDER IMPLICATIONS OF THE FINDINGS:** CBRC among French patients had been thought to reflect mainly law evasion. This study showed that the reality is much more complex and that CBRC among French patients reflects both law evasion and limited access to oocyte donation in France. It also brings new insight into the characteristics of the patients by suggesting a certain degree of 'democratization' in access to such care. However, the choice of centre seemed related to socio-economic characteristics, in that the Greek centre treated a less advantaged population than the Spanish centre.

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**TRIAL REGISTRATION NUMBER:** Not applicable.

**Key words:** assisted reproduction technologies / oocyte donation / cross-border reproductive care / sperm donation / Europe

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# Introduction

Assisted reproduction technologies (ARTs) have recently raised new ethical, medical and social issues in view of the apparent increase in people travelling outside their home country to obtain ART (Ferraretti *et al.*, 2010). Finding a name for this phenomenon was a long-debated issue (Hudson *et al.*, 2011), but the term cross-border reproductive care (CBRC) is increasingly used (Pennings *et al.*, 2008b; Inhorn and Gurtin, 2011). The CBRC Task Force of the European Society of Human Reproduction and Embryology (ESHRE) defines CBRC as 'a widespread phenomenon where infertile patients or collaborators (such as egg donors or potential surrogates) cross international borders in order to obtain or provide reproductive treatment outside their home country' (Shenfield *et al.*, 2011). CBRC is considered as a worldwide and growing phenomenon (Ferraretti *et al.*, 2010; Gurtin and Inhorn, 2011).

However, the number of persons who actually seek CBRC remained difficult to estimate, even inside Europe (Collins and Cook, 2010; Nygren *et al.*, 2010; Inhorn and Gurtin, 2011). A first rough estimate of 10% of worldwide ART cycles performed in CBRC patients had been proposed (Collins and Cook, 2010). Patients in Europe were thought to travel mostly to other European countries to obtain CBRC (Nygren *et al.*, 2010). Within Europe, a survey was carried out in 2008–2009 in six well-known destinations (Belgium, Czech Republic, Denmark, Slovenia, Spain, Switzerland) and it was estimated that 11 000–14 000 CBRC patients are treated each year in Europe (Shenfield *et al.*, 2010). In a more local approach, the Belgian register for ART also pointed out the importance of CBRC, with more than 2000 patients from 86 different countries receiving ART in Belgium annually in 2006–2007 (Pennings *et al.*, 2009).

CBRC is difficult not only to measure but also to understand, as it covers different realities worldwide (Gurtin and Inhorn, 2011). The issue is very often tackled as being primarily a 'legal' one reflecting law evasion (Pennings, 2004; Storrow, 2010; Crockin, 2011). ART use is indeed restricted in very different ways in different countries, even inside Europe (Pennings, 2004; Storrow, 2010). The law can restrict the population that have the right to be treated and/or the authorized techniques. In some countries, ART is only authorized for heterosexual couples (France, Germany), while in others ART is also available for same-sex couples and/or single individuals (Spain, Belgium, UK, Greece). Most countries set age limits for women but these differ, ranging from 41 to 50 years. Specific ART activities, such as surrogacy or oocyte donation, are prohibited in some countries (Italy, Germany, Japan), but are not illegal in other countries (Belgium, India, USA). In a European survey (Shenfield *et al.*, 2010), law evasion concerned 55% of CBRC patients (only 9% of UK patients but 65% French, 71% Italian and 80% German patients).

Other motivations could explain CBRC, in particular long waiting lists for gamete donation (Pennings, 2004; Thorn and Dill, 2010; Shenfield *et al.*, 2011). For example, ART with oocyte donation is authorized in the UK but access is somewhat restricted by lack of donors (Culley *et al.*, 2011; Hudson and Culley, 2011). Access to oocyte donation is even more markedly restricted in France, due not only to a shortage of donors but also to an insufficient number of French centres practising oocyte donation (Aballea *et al.*, 2011). Finally, patients may seek CBRC to obtain better quality of care or less costly treatment (Pennings *et al.*, 2008a; Shenfield *et al.*, 2010).

It had been pointed out that information on CBRC patients was clearly lacking (Hudson *et al.*, 2011; Inhorn and Gurtin, 2011). For more in-depth investigation, analysis had addressed only CBRC patients from one specific home country, such as the UK (Culley *et al.*, 2011; Hudson and Culley, 2011), Germany (Bergmann, 2011) or Italy (Bartolucci, 2008; Zanini, 2011). Such an approach yields a more homogeneous study population sharing the same legal, medical and cultural context. Less is known about French patients as there has been no specific study. However, France is one of the top four home countries of CBRC patients, together with Italy, Germany and the Netherlands, according to a European survey (Shenfield *et al.*, 2010).

Our aim was to study French cross-border patients in order to understand their social characteristics and also their medical pathway.

# Materials and Methods

## Study population

Data were collected between 2010 and 2012 and the study received approval from the Ined ethical board (CIL/NG/no. 10-07).

The protocol of the study was developed based on preliminary research carried out in France in 2009. This included a literature review, interviews of 6 CBRC patients' organizations, 8 physicians and researchers and 26 CBRC patients. Following this preliminary study, three countries (Belgium, Greece, and Spain) were selected as some of the main destinations of French patients using ART in other European countries. A self-administered questionnaire in French was designed and tested. The questions related to socio-demographic characteristics and the ART treatment sought in France and in other countries. The socio-demographic questions were taken from validated tools developed by the French National Institute of Statistics and Economic Studies and the French National Demographic Institute. The questions on ART in the home country and abroad were reviewed by physicians and researchers and tested on patients participating in the preliminary research.

In each country, one ART centre participated in the study by distributing the self-administered questionnaires to its French patients. The study protocol had to be adapted in each centre according to its particular organization and to the number of French CBRC patients treated each month. In Greece and Belgium, patients were included prospectively during a period of 1 and 7 months, respectively. In Spain, French patients treated during the previous 18 months were included retrospectively. To preserve total anonymity of the respondents, no identified data were collected at any time during the study. Of the 187 French patients invited to participate, 128 returned the questionnaire, an overall response rate of 68% (128/187). Response rates by country were 35% (19/54) in Belgium, 69% (22/32) in Greece and 86% (87/101) in Spain.

## Variable definitions

The main socio-demographic characteristics were respondent's gender, his/her relationship status and age of the woman at her first ART attempt in the foreign medical centre ($<43$ years/$\geq 43$ years, which corresponds to the upper age limit for ART reimbursement in the French welfare system). Other socio-demographic variables were already having a child, woman's occupation (high level including artisans, traders and executives, low/intermediate level including intermediate occupations such as primary school teachers, nurses, administrative officers or sales agents, workers and employees) and place of residence in France (Paris region, north-eastern region near the Belgian border, elsewhere).

Data collected on ART treatments, contacts and sources of information included: previous use of ART in France, membership of a patients'

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organization helping French patients to use ART abroad, information on the centre obtained from a patients' organization, information on the centre obtained from a French physician, steps taken to obtain reimbursement from the French social insurance system for ART received abroad, difficulties encountered in using ART abroad. Information on criteria for selection of the foreign centre concerned geographical proximity and treatment cost.

### Statistical analysis

Descriptive analyses were conducted on the whole sample and on homogeneous subgroups based on the country of the centre and on the ART treatment used. Percentages were compared using the $\chi^2$ test when the sample size was sufficient and the Fisher's exact test when it was not. Data analyses were carried out using STATA/SE 12.1 (Stata Press, College Station, TX, USA).

## Results

### Study population

Of the 128 French patients recruited in the three foreign clinics, 17% were treated in Greece, 68% in Spain and 15% in Belgium. The ARTs that they used differed significantly between the three centres ($P$-Fisher $< 0.01$; Table I). In the Greek and Spanish centres, French patients mainly used oocyte donation whereas in the Belgian centre they mainly used sperm donation. Three homogeneous subgroups were analysed (Table I): patients using oocyte donation in Greece ($n = 22$), those using oocyte donation in Spain ($n = 65$) and those using sperm donation in Belgium ($n = 17$). The remaining patients were grouped together as 'other cases' ($n = 24$), mostly patients treated in Spain but not using oocyte donation (see Table I for the description of treatments used by these patients).

### Socio-demographic characteristics

Table II shows the respondents' socio-demographic characteristics. In the whole sample, 96% of the respondents were women (95–100% in the subgroups). Heterosexual couples were the majority among patients seeking oocyte donation (99%, or 86/87 overall for Greece and Spain) but they were only a very small proportion (6%) of patients seeking sperm donation in Belgium ($P$-Fisher $< 0.01$). For Greece and Spain, 35% (30/86) of French patients aged 43 years and above were seeking oocyte donation versus 0% in Belgium for sperm donation ($P$-$\chi^2 < 0.01$). The proportion of women with a high occupational level varied considerably between the three subgroups ($P$-$\chi^2 = 0.03$). Regarding place of residence, 58% of patients who had travelled to Spain for oocyte donation were from the Paris region versus only 36% of patients who travelled to Greece for oocyte donation ($P$-$\chi^2 = 0.07$). A high proportion (47%) of patients in Belgium for sperm donation came from north-eastern France.

### History of ART treatment in France

The majority of patients seeking oocyte donation in Greece and Spain had been previously treated by ART in France (mainly IVF), the overall proportion for both groups being 74% (64/87) (Table III). Only 6% of patients seeking sperm donation in Belgium had previously used ART in France, a significantly different proportion than that for oocyte donation in Greece and Spain ($P$-$\chi^2 < 0.01$).

### Criteria for choice of centre for CBRC treatment

Most patients who travelled to Greece for oocyte donation were members of a patients' organization (91%). They often chose the Greek ART centre because it was recommended by a patients' organization (77%) and/or because of its low cost (91%). The majority of patients who went to Spain for oocyte donation chose the Spanish ART centre because it was recommended by a physician (83%). In most cases, neither cost nor geographical proximity were important criteria influencing choice of the Spanish ART centre. Most patients who went to Belgium for sperm donation obtained information from the internet (41%) and from friends (29%) and chose the Belgian ART centre because of its geographical proximity (71%). For the majority, the Belgian centre had not been recommended by a patients' organization or a French physician. Comparing the three subgroups, the five variables describing reasons for choosing the ART centre were significantly different ($P$-Fisher $< 0.01$ for recommendation by a patients' organization, geographical proximity, treatment cost and $P$-$\chi^2 < 0.01$ for membership of a patients' organization and for recommendation by a physician).

**Table I Type of ART requested by 128 French CBRC patients according to country of destination.**

| | All patients ($n = 128$), 100% | | Greece ($n = 22$), 17% | | Spain ($n = 87$), 68% | | Belgium ($n = 19$), 15% | |
|---|---|---|---|---|---|---|---|---|
| | *n* | % | *n* | % | *n* | % | *n* | % |
| Ooocyte donation | 87 | 68 | 22 | 100 | 65 | 74 | 0 | 0 |
| Sperm donation | 22 | 17 | 0 | 0 | 5 | 6 | 17 | 89 |
| Oocyte and sperm donation | 5 | 4 | 0 | 0 | 5 | 6 | 0 | 0 |
| Embryo donation | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| IVF | 6 | 5 | 0 | 0 | 6 | 7 | 0 | 0 |
| Oocyte cryopreservation | 5 | 4 | 0 | 0 | 5 | 6 | 0 | 0 |
| Surrogacy | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 11 |

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**Table II** Socio-demographic characteristics of 128 French CBRC patients.

| | All patients ($n$ = 128) | | Oocyte donation | | | | Sperm donation | | Other cases[a] ($n$ = 24) | | Key differences between groups[b] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Greece ($n$ = 22) | | Spain ($n$ = 65) | | Belgium ($n$ = 17) | | | | |
| | $n$ | % | $n$ | % | $n$ | % | $n$ | % | $n$ | % | |
| Respondent's gender | | | | | | | | | | | |
| Female | 123 | 96 | 21 | 95 | 62 | 95 | 17 | 100 | 23 | 96 | |
| Male | 5 | 4 | 1 | 5 | 3 | 5 | 0 | 0 | 1 | 4 | |
| Relationship status[c] | | | | | | | | | | | Greece + Spain versus Belgium: $P$-Fisher < 0.01 |
| Heterosexual couple | 99 | 77 | 22 | 100 | 64 | 98 | 1 | 6 | 12 | 50 | |
| Female couple | 14 | 11 | 0 | 0 | 0 | 0 | 12 | 71 | 2 | 8 | |
| Single woman | 15 | 12 | 0 | 0 | 1 | 2 | 4 | 23 | 10 | 42 | |
| Woman's age (years) | | | | | | | | | | | Greece + Spain versus Belgium: $P$-$\chi^2$ < 0.01 for <43/≥43 |
| 27–37 | 39 | 31 | 6 | 27 | 11 | 17 | 13 | 76 | 9 | 37 | |
| 38–42 | 53 | 42 | 8 | 37 | 31 | 48 | 4 | 24 | 10 | 42 | |
| 43–48 | 32 | 25 | 6 | 27 | 22 | 34 | 0 | 0 | 4 | 17 | |
| 49–50 | 3 | 2 | 2 | 9 | 0 | 0 | 0 | 0 | 1 | 4 | |
| Already have children | | | | | | | | | | | |
| No | 89 | 70 | 15 | 68 | 45 | 69 | 10 | 59 | 19 | 79 | |
| Yes | 39 | 30 | 7 | 32 | 20 | 31 | 7 | 41 | 5 | 21 | |
| Woman's occupational level | | | | | | | | | | | Greece versus Spain versus Belgium: $P$-$\chi^2$ = 0.03 |
| High | 51 | 40 | 4 | 18 | 32 | 50 | 6 | 35 | 9 | 39 | |
| Low/intermediate | 75 | 59 | 18 | 82 | 32 | 50 | 11 | 65 | 14 | 61 | |
| Place of residence | | | | | | | | | | | Greece versus Spain : $P$-$\chi^2$ = 0.07 for Paris region versus North-eastern France + other regions |
| Paris region | 61 | 48 | 8 | 36 | 38 | 58 | 4 | 24 | 11 | 46 | |
| North-eastern France | 29 | 23 | 2 | 9 | 13 | 20 | 8 | 47 | 6 | 25 | |
| Other | 38 | 30 | 12 | 55 | 14 | 22 | 5 | 29 | 7 | 29 | |

[a]'Other cases' are detailed in Table I. They included French CBRC patients treated in Spain using sperm donation ($n$ = 5), both sperm and oocyte donation ($n$ = 5), embryo donation ($n$ = 1), IVF ($n$ = 6) and oocyte cryopreservation ($n$ = 5), as well as patients treated in Belgium using surrogacy ($n$ = 2).
[b]$P$-$\chi^2$ if the test is the $\chi^2$ test, $P$-Fisher if the test is the Fisher test.
[c]Same-sex couples and single women have legal access to ART in Spain and in Belgium but not in France. In Greece, single women have legal access to ART but same-sex couples do not.



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**Table III ART treatments, criteria for choice of centre and sources of information used by 128 French CBRC patients.**

| | All patients ($n$ = 128) | | Oocyte donation | | | | Sperm donation | | Other cases[a] ($n$ = 24) | | Key differences between groups[b] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Greece ($n$ = 22) | | Spain ($n$ = 65) | | Belgium ($n$ = 17) | | | | |
| | $n$ | % | $n$ | % | $n$ | % | % | $n$ | $n$ | % | |
| Previous use of ART in France | | | | | | | | | | | Greece + Spain versus Belgium: $P$-$\chi^2 < 0.01$ |
| Yes | 74 | 58 | 15 | 68 | 49 | 75 | 1 | 6 | 9 | 37 | |
| No | 54 | 42 | 7 | 32 | 16 | 25 | 16 | 94 | 15 | 63 | |
| Membership of a patients' organization | | | | | | | | | | | Greece versus Spain versus Belgium: $P$-$\chi^2 < 0.01$ |
| Yes | 53 | 42 | 20 | 91 | 26 | 40 | 3 | 18 | 4 | 17 | |
| No | 74 | 58 | 2 | 9 | 39 | 60 | 14 | 82 | 19 | 83 | |
| A patients' organization recommended the centre | | | | | | | | | | | Greece versus Spain versus Belgium: $P$-Fisher $< 0.01$ |
| Yes | 27 | 21 | 17 | 77 | 8 | 12 | 0 | 0 | 2 | 8 | |
| No | 101 | 79 | 5 | 23 | 57 | 88 | 17 | 100 | 22 | 92 | |
| A physician recommended the centre | | | | | | | | | | | Greece versus Spain versus Belgium: $P$-$\chi^2 < 0.01$ |
| Yes | 73 | 57 | 3 | 14 | 54 | 83 | 1 | 6 | 15 | 63 | |
| No | 55 | 43 | 19 | 86 | 11 | 17 | 16 | 94 | 9 | 37 | |
| Geographical proximity | | | | | | | | | | | Greece versus Spain versus Belgium: $P$-Fisher $< 0.01$ |
| Was a criterion | 27 | 21 | 0 | 0 | 8 | 12 | 12 | 71 | 7 | 30 | |
| Was not a criterion | 100 | 79 | 22 | 100 | 57 | 88 | 5 | 29 | 16 | 70 | |
| Cost | | | | | | | | | | | Greece versus Spain versus Belgium: $P$-Fisher $< 0.01$ |
| Was a criterion | 24 | 19 | 20 | 91 | 1 | 2 | 1 | 6 | 2 | 9 | |
| Was not a criterion | 103 | 81 | 2 | 9 | 64 | 98 | 16 | 94 | 21 | 91 | |
| Reimbursement in France requested | | | | | | | | | | | |
| Yes | 52 | 41 | 7 | 32 | 32 | 49 | 8 | 47 | 5 | 22 | |
| No | 75 | 59 | 15 | 68 | 33 | 51 | 9 | 53 | 18 | 78 | |
| Difficulties in using ART abroad | | | | | | | | | | | Greece + Spain versus Belgium: $P$-$\chi^2 < 0.01$ |
| Yes | 52 | 41 | 9 | 41 | 19 | 30 | 14 | 82 | 10 | 42 | |
| No | 74 | 59 | 13 | 59 | 44 | 70 | 3 | 18 | 14 | 58 | |

[a]'Other cases' are detailed in Table I. They included French CBRC patients treated in Spain using sperm donation ($n$ = 5), both sperm and oocyte donation ($n$ = 5), embryo donation ($n$ = 1), IVF ($n$ = 6) and oocyte cryopreservation ($n$ = 5), as well as patients treated in Belgium using surrogacy ($n$ = 2).
[b]$P$-$\chi^2$ if the test is the $\chi^2$ test, $P$-Fisher if the test is the Fisher test.



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### Experiences of CBRC

Reimbursement by the French welfare system of treatment in the European centre had been requested by 41% of patients; no differences could be demonstrated between the three subgroups ($P$-$\chi^2 = 0.36$) or by previous use of ART in France ($P$-$\chi^2 = 0.53$) or the woman's age when considering women <43 years ($P$-$\chi^2 = 0.88$). The proportion of patients who stated they had difficulties in using ART abroad was broadly the same for oocyte donation in Greece and Spain, with an overall proportion of 33% (28/85). Significantly more patients had difficulties in obtaining sperm donation in Belgium (82%) than in obtaining oocyte donation in Greece and Spain ($P$-$\chi^2 < 0.01$). The main difficulties encountered in using ART abroad, according to treatment and country, related to conciliating medical treatment and professional activity for oocyte donation in Greece (55%), cost of treatment for oocyte donation in Spain (68%) and waiting time for sperm donation in Belgium (71%).

## Discussion

### Centre or country specialization according to ART technique?

The 128 French CBRC patients used the Spanish (74%) and Greek (100%) centres specifically for oocyte donation and the Belgian centre (89%) for sperm donation. This observation could reflect specialization of a centre in one ART technique, and possibly also a targeted choice of CRBC country by French patients. Spain has already been identified as a destination of choice for patients seeking oocyte donation (Shenfield *et al.*, 2010; Bergmann, 2011). The large number of French patients using sperm donation in Belgium has also been described in Belgian publications (Pennings *et al.*, 2009; De Sutter, 2011): 73% of French CBRC patients in Belgium used sperm donation, and 80% of CBRC patients using sperm donation in Belgium were French (Pennings *et al.*, 2009; De Sutter, 2011). Reasons for travel to Greece are still almost unknown and require further investigation.

### Reasons for CBRC: law evasion but also difficulties in accessing ART in the home country

Regarding reasons for cross-border travel, a highly contrasted situation was revealed in our study. On the one hand, a vast majority (94%) of patients going to Belgium for sperm donation were not legally eligible for ART in France because they were same-sex couples or single women. For these patients, it could be speculated that CBRC is motivated by avoidance of legal restrictions. This observation is in agreement with other research that underlined the role played by law evasion in CBRC (Pennings *et al.*, 2009; Shenfield *et al.*, 2010; Crockin, 2011; Inhorn and Gurtin, 2011). On the other hand, 64% of patients going to Greece and Spain for oocyte donation could theoretically have obtained fully reimbursed oocyte donation treatment in France (heterosexual couples where the woman was aged <43 years). For these patients, CBRC is principally motivated by the exceedingly restricted access to oocyte donation in France (long waiting lists due to the shortage of donors and to the very small number of French ART centres practising oocyte donation). In fact, it is possible that some of these patients had been (or would have been) refused by French ART centres, which apply more restrictive age-access conditions than the age limit of 43 years laid down by the national health system (Marchaudon *et al.*, 2007). This aspect of French CBRC, motivated by the exceedingly restricted access to oocyte donation, is much less known than the law evasion issue and was poorly described in the European survey (Shenfield *et al.*, 2010), probably because it only included a few self-selected centres in Spain and none in Greece. Nevertheless, the impact of restricted access to oocyte donation in the home country has already been pointed out in studies of CBRC patients from the UK (Shenfield *et al.*, 2010; Culley *et al.*, 2011). To summarize, French CBRC patients seeking sperm donation and those seeking oocyte donation are two populations that differ considerably in their characteristics (same-sex couples and single women versus heterosexual couples) and their motivations (law evasion versus difficulties in treatment access). It would be interesting in further research to compare heterosexual couples from France and the UK who seek oocyte donation, in order to better understand the similarities and/or differences between these two populations.

### Towards a democratization of CBRC?

The socio-demographic characteristics of CBRC patients have previously received little attention in the literature. It is usually hypothesized *a priori* that only wealthy patients are able to access CBRC, but in a recent literature review the authors pointed out the need to ascertain the accuracy of such a claim (Hudson *et al.*, 2011). An alternative hypothesis has also been discussed: CBRC could allow less wealthy patients to have access to cheaper treatments that they cannot afford in their home country (Pennings, 2004), for example, UK patients who seek less costly treatments abroad (Culley *et al.*, 2011). In our study population, 59% of patients had a low/intermediate occupational level (compared with 81% of women in the general French population), which clearly does not support the 'wealthy' hypothesis. However, neither is the 'cheaper treatment' hypothesis valid for French CBRC patients, as France is one of the six countries worldwide to give complete coverage for ART treatments (International Federation of Fertility Societies, IFFS, 2007). Thus, the relatively high proportion of patients with low/intermediate occupational level could be consistent with the hypothesis of a certain 'democratization' of the CBRC phenomenon in the French population. However, our study also showed important social differences. A marked socio-economic gap was observed between patients using oocyte donation in the Greek centre and those using the same treatment in the Spanish centre: in the latter, 50% of patients belonged to the low/intermediate occupational group whereas in the Greek centre, 82% belonged to this group ($P$-$\chi^2 < 0.01$). This socio-economic gap is coherent with the proportion of patients declaring that the cost of the treatment was a criterion in their ART centre choice: 2% of patients in Spain versus 91% in Greece.

### Choice of destination: a centre effect

Apart from treatment cost, different sources of information influenced the choice of ART centre. The Greek centre for oocyte donation was mainly recommended by a patients' organization (77%). In fact, in most cases, French patients had been put in contact with the Greek centre through a French patients' organization, which informs patients on the medical care provided at the centre and on travel and stay in Greece, and which has an agreement for discount treatment rates. The important role of patients' organizations in assisting in preparations for CBRC has already been pointed out (Blyth, 2010; Thorn and Dill,

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2010). However, our research illustrated how a particular centre can be linked to and promoted by a particular patients' organization. Conversely, in the Spanish centre, most of the French CRBC patients (88%) had not been recommended by a patients' organization, and the majority (83%) declared that this centre had been recommended by a physician. This high percentage of physician recommendation can partly be explained by the worldwide notoriety and reputation of the Spanish centre. But maybe more importantly, the physician responsible for French-speaking CBRC patients in the Spanish centre had previously worked in France and still had close connections with the French ART medical network. Regarding the Belgian centre, no specific source of information emerged (0% declared that the centre had been recommended by a patients' organization and 6% by a physician). This finding was surprising, as there is an influential patients' organization in France for same-sex couples that informs and helps CBRC patients. Choice of the Belgian centre seemed clearly related to geographical proximity: this was a criterion of choice for 71% of CBRC patients in this centre and nearly half (47%) in fact lived in north-eastern France, near the Belgian border.

In the three centres that were investigated here, choice of centre was determined in three very different ways: a patients' organization, French physicians or geographical proximity. Recommendation played a very important role in the choice of centre and so the communication network developed by the centre in the patients' home country seems to have a considerable impact on recruitment. This demonstrates the difficulty of understanding CBRC networks as they may be highly centre-dependent and may differ according to the patients' country of origin.

### Study limitations

A limitation of this study is the representativeness of the sample. First, the three ART centres selected cannot be considered as representative of all European ART centres treating French CBRC patients (although both private and public centres took part in this study). Secondly, the relatively small number of observations (a total of 128 patients) raised issues concerning sample representativeness. Nevertheless, similar sample size limitations are also observed in other studies on CBRC patients which included 36–95 patients (Blyth, 2010; Bergmann, 2011; Culley *et al.*, 2011).

Our study dealt only with CBRC among French patients treated in Europe. This had important consequences on the population recruited, which included neither single men nor male couples who probably seek CBRC outside Europe in order to use surrogacy, for example, in India (Norton *et al.*, 2013). Complementary research should be carried out in the USA and in India in order to also examine use of CBRC by men.

Finally, this research was based on a self-administered paper questionnaire, whereas face-to-face interviews would be needed to explore in greater depth the experiences of CBRC patients.

To conclude, this research showed that even CBRC patients originating from the same country (France in the present case) cannot be considered as a homogeneous patient population. This result is in line with the conclusions of a paper on the UK patients, which already pointed out the complex and diverse motivations of CBRC patients in the UK by using the sociological concept of 'seriality' to describe this heterogeneity (Hudson and Culley, 2011). However, the present study does not only explore patients' motivations but also their characteristics in a broader sense (for example, same-sex or heterosexual couples, socio-economic level). It demonstrated how patients' characteristics have a decisive impact on the CBRC pathway they use, influencing the choice of country and probably also the choice of centre within the country. Larger and more representative studies should explore more deeply the characteristics and pathways of CBRC patients. However, it will clearly be a real challenge to obtain a representative study population in view of the marked heterogeneity of the CBRC phenomenon depending on the patients' country of origin, the country of destination and probably also the ART centre itself.

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## Authors' roles

V.R.G. was involved in study design, acquisition of data, analysis and interpretation of data and drafting of the manuscript. E.L.R. was involved in study design, analysis and interpretation of data and drafting of the manuscript.

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## Conflict of interest

The authors have no conflict of interest to declare.

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