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ORIGINAL ARTICLE *Infertility*

Cross-border reproductive care in Belgium

G. Pennings[1,18], C. Autin[2], W. Decleer[3], A. Delbaere[4], L. Delbeke[5], A. Delvigne[6], D. De Neubourg[7], P. Devroey[8], M. Dhont[9], T. D'Hooghe[10], S. Gordts[11], B. Lejeune[12], M. Nijs[13], P. Pauwels[14], B. Perrad[15], C. Pirard[16], and F. Vandekerckhove[17]

[1]Bioethics Institute Ghent, Ghent University, Ghent, Belgium [2]Hôpital Universitaire Saint-Pierre, Clinique de Procréation Médicalement Assistée, Bruxelles, Belgium [3]A.Z.Jan Palfijn, Centrum voor Fertiliteitstherapie, Gent, Belgium [4]Hôpital Erasme, Centre de FIV de l'ULB, Bruxelles, Belgium [5]Universitair Ziekenhuis Antwerpen, Centrum voor Reproductieve Geneeskunde, Antwerpen, Belgium [6]Clinique Saint Vincent, Centre Liégeois pour l'Etude et le Traitement de la Stérilité, Rocourt, Belgium [7]Algemeen Ziekenhuis Middelheim, Dienst Fertiliteit, Antwerpen, Belgium [8]Universitair Ziekenhuis Brussel, Centrum voor Reproductive Geneeskunde, Brussel, Belgium [9]Universitair Ziekenhuis Gent, Vrouwenkliniek—Infertiliteitscentrum, Gent, Belgium [10]Universitaire Ziekenhuizen K.U.Leuven, Leuven University Fertility Centre, Leuven, Belgium [11]Regionaal Ziekenhuis Heilig Hart, Leuven Institute for Fertility and Embryology, Leuven, Belgium [12]CHIREC, C.G. Interrégional Edith Cavell, Bruxelles, Belgium [13]Ziekenhuis Oost-Limburg, Centre for Reproductive Medicine, Genk, Belgium [14]Centre Hospitalier Régional de Namur, Service Gynéco, Namur, Belgium [15]Grand Hôpital de Charleroi—Site Notre-Dame, Centre Hennuyer d'Aide Médicale à la Procréation, Charleroi, Belgium [16]Cliniques Universitaires Saint-Luc, Gynéco-FIV, Bruxelles, Belgium [17]Algemeen Ziekenhuis Sint-Jan, BIRTH Fertiliteitskliniek, Brugge, Belgium

[18]Correspondence address: Guido Pennings, Bioethics Institute Ghent, Ghent University, Blandijnberg 2, 9000 Gent, Belgium. Tel/Fax: +32 16 620 767; E-mail: Guido.Pennings@Ugent.be

BACKGROUND: Cross-border reproductive care indicates the cross-border movements made by patients to obtain infertility treatment they cannot obtain at home. The problem at present is that empirical data on the extent of the phenomenon are lacking. This article presents the data on infertility patients going to Belgium for treatment.

METHODS: A survey was conducted among the centres for reproductive medicine that are allowed to handle oocytes and create embryos (B-centres). Data were collected on the nationality of patients and the type of treatment for which they attended during the period 2000–2007.

RESULTS: Sixteen of 18 centres responded to the questionnaire. The flow of foreign patients has stabilized since 2006 at approximately 2100 patients per year. The majority of foreign nationals seeking treatment in Belgium were French women for sperm donation. The next highest group was patients entering the country to obtain ICSI with ejaculated sperm.

CONCLUSIONS: There are clear indications that numerous movements are motivated by the wish to evade legal restrictions in one's home country, either because the technology is prohibited or because the patients have characteristics, which exclude them from treatment in their own countries.

Key words: cross-border reproductive care / foreign patients / law / reproductive tourism

Introduction

In the last decade, there has been a steady rise in cross-border reproductive care. Reproductive tourism, as it has been disparagingly called, attracts more and more interest because of its increasing visibility. The media eagerly present the spectacular cases; elderly women conceiving abroad, a British woman transporting her dead husband's sperm to Belgium for insemination, gay men looking for a surrogate mother in India. The anecdotal evidence available through clinics and patients suggests several reasons why people travel to another country to obtain treatment; a certain type of treatment is not allowed in their home country, they are excluded from treatment because of specific characteristics (for example age or sexual orientation), the technology is not available [such as preimplantation genetic diagnosis (PGD)], the waiting lists are too long (for treatments such as oocyte donation) or the out-of-pocket costs for the patients are too high (Pennings, 2004). The phenomenon raises a whole set of ethical problems going from law evasion and equity of access to professional responsibilities and safety issues (ESHRE Task Force on Ethics and Law, 2008).

Table I Age and rank (number of cycles) provided to patients with and without social security from 2004 to 2006

	2004			2005			2006		
Patient age and rank	Age <43 Rank <7	Age ≥43	Age <43 Rank ≥7	Age <43 Rank <7	Age ≥43	Age <43 Rank ≥7	Age <43 Rank <7	Age ≥43	Age <43 Rank ≥7
Patients with social security (%)	98.4	45.6	28.1	95.2	38.9	28.7	95.2	42.2	29.3
Patients without social security (%)	1.6	54.4	71.9	4.8	61.1	71.3	4.8	57.8	70.7

Source: BELRAP reports 2007–2009.

Reliable data to evaluate cross-border reproductive care is required. At the moment, data on the extent of this phenomenon is mostly lacking. European data are available for certain specific treatments, like PGD (Corveleyn *et al*., 2008), and partial data for specific countries is available. In Italy, for instance, as part of the campaign against Law 40 on Assisted Reproduction, information was collected about the number of patients looking for a solution abroad. The number of Italians leaving Italy increased from 1315 before the law to 3610 1 year after the law (based on information from a selected number of foreign centres) (Fornasiero, 2005). However, for most other treatments and countries, hard data are scarce.

Assisted reproductive technology in Belgium

Belgium is located centrally in Europe; it is composed of three regions: flanders (Flemish speaking), Brussels (officially bilingual but in reality French speaking) and Wallonia (French speaking). All clinics have an official language depending on the region where they are located. The clinics in the Brussels region are supposed to be bilingual but they have a clear majority of either French or Dutch speaking personnel. Health care is organized at the federal level. Belgium's first *in vitro* fertilization (IVF) baby was born in 1983. Its centres contribute to the development of new techniques in the field of medically assisted reproduction, play a major role in the European and world organizations and participate in many scientific studies in the field. Belgium has, compared with many other European countries, an advantageous insurance system that guarantees equitable access to reproductive health care. This point can be shown by comparing the uptake of assisted reproduction in Belgium to the theoretical estimate. The need for ART (IVF/ICSI) per annum per million population is estimated at 1500 (Ombelet, 2007). The uptake of ART in Belgium is 1337, only slightly below the optimal uptake (although the number of cycles used to calculate the uptake includes the cycles offered to foreign patients) (Collins, 2008). The law of 1 July 2003 stipulated the complete reimbursement of six IVF/ICSI cycles per patient (lifetime) below the age of 43. Reimbursement was linked to restrictions on the number of embryos to be transferred (depending on the cycle rank and the age of the woman). This system has led to a substantial reduction (over 50%) of the number of multiple pregnancies and to a significant increase (over 30%) in the number of IVF cycles (Debrock *et al*., 2005; Ombelet *et al*., 2005).

Available information on foreign infertility patients in Belgium

Only partial data were available for infertility treatment for foreign patients in Belgium prior to this study. Most information was gathered from the BELRAP (Belgian Register for Assisted Procreation) reports, published by the College of Physicians for Assisted Reproduction Therapy. The BELRAP report of 1998–99 reported that 39% of the 418 cycles for oocyte donation were performed for Belgian patients and 61% for non-Belgian patients. In 1999, the proportion of foreigners among the oocyte donation cycles had risen to 75.2%. After that year, the information on the distribution of foreign and national patients for oocyte donation was no longer included in these reports. In 1999, 70% of all IVF/ICSI cycles were done for Belgian patients. By 2001, 33% of all fresh cycles and 41.2% of the thawed cycles were done for foreign patients. A report of the College of Physicians for Assisted Reproduction Therapy (2006), comparing the data of two periods (from 1 January 2002 till 31 December 2002 and from 1 July 2003 till 30 June 2004), showed a substantial increase of Belgian patients. This can be explained by the new regulation on the reimbursement of IVF cycles which entered into practice on 1 July 2003. In the first period, 79% of all fresh cycles were done for patients with Belgian social security. In the second period, 84.5% were done for patients with Belgian social security. This increase was caused by the increase in Belgian patients (due to the reimbursement rule) since the absolute number of foreign patients also increased in the second period. From that period onwards, the percentage of cycles offered to patients without social security is situated between 15 and 20% (15.9% in 2004, 19.3% in 2005 and 15.8% again in 2006) (College of Physicians for Assisted Reproduction Therapy, 2007, 2008, 2009). The data from 2004 reveal that the proportion of cycles performed for patients without social security in Belgium increased drastically when the patients are 43 years of age and older and when the patients are younger than 43 but have done more than six cycles (Table I).

The number of embryos transferred differs amongst patients with and without social security. The percentage of single embryo transfers in cycles for patients without social security was considerable lower than in cycles for patients with social security (Table II).

This trend can be explained at least partially by the difference in patients' age and by the cycle rank, since a larger proportion of foreign patients have already performed more than one treatment cycle before coming to Belgium. However, other factors might also play a role. It has been argued that patients who have to pay for treatment themselves are more likely to accept transfer of more embryos. Even stronger, they may demand transfer of more than one embryo in order to maximize their chance of success (ESHRE Task Force on Ethics and Law, 2003). For the older patients, the time pressure linked to the increase in success rate may underlie the wish to have several embryos replaced. The BELRAP reports present the data

Table II Number of embryos transferred in cycles provided to patients with and without social security from 2004 to 2006

Number of embryos transferred	2004				2005				2006				
	1	2	3	>3	1	2	3	>3	1	2	3	>3	Unknown
Patients with social security (%)	52.0	40.8	6.1	1.0	51.2	42.1	5.9	0.8	43.5	33.6	4.7	0.4	17.7
Patients without social security (%)	28.9	50.0	17.1	4.0	31.2	46.5	18.4	3.9	24.7	36.0	14.1	2.0	23.2

Source: BELRAP reports 2007–2009.

according to whether or not the patient has social security. However, this does not correlate perfectly with the patient's residence. In 2001, for instance, about 5% of the IVF patients had no social security but still resided in Belgium.

The goal of the present study was to obtain detailed data on the inflow of foreign patients for infertility treatment. We collected data on the nationality of the patients and the type of treatment. In addition, we also investigated how the flow changed over time.

Methods

A questionnaire was send to all B-centres for reproductive medicine in May 2008. Belgium counts 13 A-centres for reproductive medicine (1 per 700 000 inhabitants) and 18 B-centres. The main difference between these two types is that only B-centres have permission by royal decree (15 February 1999) to handle oocytes and create embryos *in vitro*. This implies that only B-centres can perform IVF and ICSI.

The questionnaire started with six general questions regarding the attitude to and the relationship with foreign patients. These questions were subdivided in two sets. For the first subset, the centres were asked only to mark which of the listed items applied. The questions were: (i) Do special rules apply to foreign patients that do not apply to national patients?; (ii) Does your centre make special efforts to improve or facilitate the treatment of foreign patients?; (iii) Does your centre make special efforts to attract foreign patients? For the second subset, the clinics were asked to score different options from 1 to 6, with 1 being most important and 6 not important at all. Question 4 asked what problems they experience most with foreign patients? The following options were presented: problems with making and keeping arrangements; language and general communication problems; administrative problems (registration etc.); payment problems; not familiar with their religious, philosophical or cultural rules. Question 5 was what problems do foreign patients (according to you) experience most? The options offered were: problems with making and keeping arrangements; language and general communication problems; administrative problems (registration etc.); payment problems; homesickness and lack of contact with family and friends and not familiar with our religious, philosophical or cultural rules. Finally, question 6 asked for which reasons foreign patients (according to you) come to a Belgian centre? The options to be scored were: the treatment is forbidden in their country; they are not eligible for treatment because they do not fulfil certain criteria (such as being too old or homosexual, etc.), the treatment is too expensive in their country; the centres in their country does not possess the necessary expertise; the waiting list are much longer in their country; and they want an anonymous donor. For all six questions, the option 'other' was also offered.

This set of questions was followed by questions regarding the number of foreign patients. The centres were asked how many patients they treated from different countries per year for the period 2000–2007, subdivided per type of treatment. Eight types of treatment were distinguished: sperm donation, oocyte donation, embryo donation, intrauterine insemination (IUI) with partner sperm, IVF with own gametes, intracytoplasmic sperm injection (ICSI) with ejaculated sperm, ICSI with non-ejaculated sperm and PGD. The information reported by the centres was per treatment cycle since this is how the data were stored in their databases. To diminish the burden of the data collection, centres were asked to provide detailed data only for those countries from which they treated more than five patients per year. Centres were asked to simply list different countries from which they saw less than five patients. Finally, the centres reported the total number of treatments per year and per type of treatment for all patients (foreign and national together) and an estimate of the mean number of treatments per patient per type of treatment.

Table III Number of centres with special rules for foreign patients

	Number of centres
They have to bring their own oocyte donor	5
They have to bring their own sperm donor	0
There is a limit on the number of foreign patients	3
They have to pay in advance	10

Results

The questionnaire was returned by 16 centres (88.8% response rate).

Attitude to and relationship with foreign patients

The first question was whether the clinic had special rules for foreign patients that did not apply to Belgian patients (Table III). Five clinics indicated that they expected foreign patients to bring their own oocyte donor. No clinic mentioned this condition for sperm donation. Three clinics had a limitation on the number of foreign patients. Finally, 10 clinics ask foreign patients to pay in advance.

The second question addressed whether the clinic made special efforts to facilitate or improve the treatment of foreign patients (Table IV). A large number of clinics (14 of 16) had interpreters available on demand. However, only 12 centres indicated that the informed consent forms were translated in several languages. Fourteen centres collaborated with a doctor in the country of origin of the patient. Thirteen clinics combined the appointments (to the

Table IV Number of centres that made special efforts to facilitate or improve the treatment of foreign patients

	Number of centres
Members of foreign origin on the medical staff help with the reception of foreign patients	6
Interpreters are available on demand	14
Appointments are combined in one day	13
Treatment is adapted whenever possible	13
Informed consent forms are available in several languages	12
The centre collaborates with the local doctor of the patient	14

Table V Number of centres that made special efforts to attract foreign patients

	Number of centres
Webpage in English or another foreign language	10
Practical support beside the medical treatment (hotel reservation, travelling, visa . . .)	3
Publicity on international websites and/or journals	1

gynaecologist and the psychologist for instance) on one day and adapted the treatment where possible to reduce the number of visits (and trips) to the clinic. Finally, six centres had members of foreign origin in their medical staff who provided support to patients who speak the same language.

The third question regarded the special efforts made by the centres to attract foreign patients (Table V). Ten centres had a website in English or another foreign language. Three centres also provided practical support beside the medical treatment, i.e. hotel reservations, visa and/or travel arrangements. No centre indicated that it made publicity on international web pages or journals but one centre mentioned Healthcare Belgium (see later) in the category 'other'. Since this organization strives to promote Belgian clinics abroad, it can be counted as a positive answer.

The second subset of questions probed into the problems of patients and clinics. The original task for the clinics was to rank the different options from 1 to 6 with 1 being most important and 6 not important at all. However, some respondents misunderstood the scoring system and only coded the options as 1 (important) and 2 (less important). We recoded the answers 2 and higher to 2. Question 4 asked whether the centres themselves experienced difficulties with foreign patients. Generally speaking, few problems were evaluated as of major importance (Table VI).

Keeping appointments and language and communication problems were mentioned most frequently. However, most clinics that answered this question (13 in total) reported these sorts of problems as being of lesser importance. When asked what the centres thought were the main problems for the foreign patients (question 5), language and administrative problems were mentioned most frequently (Table VII). Of less importance were keeping appointments, language/communication and financial problems.

Table VI Evaluation of the problems infertility centres experience with foreign patients

	Important	Less important
Problems with keeping appointments	4	6
Language and general communication problems	3	9
Administrative problems	2	7
Financial problems	1	8
Not familiar with their religious, philosophical or cultural rules	0	8

Table VII Evaluation of problems foreign patients experience according to the infertility centres

	Important	Less important
Problems with keeping appointments	2	10
Language and general communication problems	5	8
Administrative problems	5	6
Financial problems	2	8
Not familiar with our religious, philosophical or cultural rules	0	6
Homesickness, lack of contact with friends and family	0	5

Finally, the clinics were asked for the reasons why, according to them, foreign patients came to Belgian clinics (Table VIII). The most important reasons were a legal prohibition in their home country and the failure to fulfil certain conditions for access. Less important reasons were the treatment cost and the lack of expertise in their home country. In some countries, the law imposes criteria for eligibility. In France, for instance, couples have to be heterosexual, part of a stable relationship and of reproductive age to have access to assisted reproduction. In these cases, a legal prohibition coincides with the failure to fulfil certain criteria.

Quantitative data on foreign patients

The questionnaire asked for the numbers of foreign patients from 2000 onwards. However, only eight centres were able to provide data from that year. One centre reported data from 2001, another one from 2002, five from 2003 and an additional one only from 2005. For the analysis by nationality and treatment type, only the data from 2005 till 2007 were used because these data are complete and bias due to missing centres is avoided.

The centres merely listed the countries from which they treated less than five patients per year. This resulted in an impressive list of 86 nationalities. Although it is difficult to estimate the number of patients from these less represented nationalities, we believe that they do not exceed 5% of all foreign patients coming to Belgium.

Total number of foreign patients

The number of patients was obtained by dividing the number of treatment cycles per type of treatment by the mean number of cycles for each type of treatment per patient. The results for 2003–2007 are reported in Table IX. The total number of foreign patients increased from 1456 in 2003 to 2117 in 2007.

Analysis by nationality

When only nationality is considered (without regard for the type of treatment), four countries rank far above the others: France (38%), The Netherlands (29%), Italy (12%) and Germany (10%) (Fig. 1). These countries account for the majority (89%) of all foreign patients seeking treatment in Belgium. Hereafter, we will only present the data for these countries.

Table VIII Evaluation of reasons for foreign patients to travel to Belgium according to the infertility centres

	Important	Less important
Treatment is forbidden in the country of origin	9	5
Patients do not fulfill the conditions to obtain treatment (too old, homosexuals . . .) in their home country	11	3
Treatment is more expensive in their home country	2	10
The centres in their home country do not have the necessary expertise	4	10
The waiting lists are much longer in their country of origin	4	8
They want to have an anonymous donor	5	7

Overwhelmingly, the majority of patients from France attended for sperm donation (73%) (Fig. 2A). Oocyte donation (11%) and ICSI with ejaculated sperm (8%) followed far behind. Patients from the Netherlands mainly came to Belgium to obtain ICSI with ejaculated sperm (38%) (Fig. 2B). Three other types of treatment (sperm donation, ICSI with non-ejaculated sperm and IVF with own gametes) each attracted around 15% of the Dutch patients. Fifty-six percent (56%) of the Italian patients came for ICSI with ejaculated sperm, 18% for IVF with own gametes and 12% for PGD (Fig. 2C). Only 8% of the Italians visited Belgium to obtain donor sperm. German patients who travelled to Belgium mainly looked for ICSI with ejaculated sperm (43%). The second most common treatment sought was PGD (25%), followed by IVF with own gametes (19%) (Fig. 2D).

For most other countries with more than five patients per year (Malta, Macedonia, Spain, UK, USA, Switzerland, Sweden, Burkina Faso, Morocco, Greece, United Arab Emirates, Kuwait, Saudi Arabia, Lebanon and Israel), the treatment requested most frequently was ICSI with ejaculated sperm.

Analysis by type of treatment

Among foreign patients asking for ICSI with non-ejaculated sperm, the largest groups came from The Netherlands (66%). Italy (8%), France (6%) and Germany (5%) followed far behind (Fig. 3A). With the exception of Italy, these are countries that border Belgium. German (33%), Italian (20%) and Dutch (15%) patients were the largest users of PGD (Fig. 3B). For sperm donation, 80% of the treatment cycles were performed for women from France, 13% for women from The Netherlands and 3% from Italy (Fig. 3C).

A similar trend was observed for oocyte donation: 64% from France, followed by The Netherlands (26%), Germany (5%) and Italy (3%). For IUI with partner semen, the overwhelming majority of treatments was done for patients from The Netherlands (77%), followed by France (18%) and Luxembourg (4%). Finally, for IVF with the couple's own gametes, the Dutch patients were leading (34%) followed by Italy (18%), Luxembourg (17%) and Germany (15%).

Evolution in time

The data indicate a steady increase in the number of patients coming to Belgium for infertility treatment. The lack of complete data from

Table IX Number of foreign patients per type of treatment between 2003 and 2007

Type of treatment	Mean number of cycles per patient	Number of patients				
		2003	2004	2005	2006	2007
Sperm donation	4.0	518	491	572	726	764
Oocyte donation	1.6	185	152	153	136	120
Embryo donation	1.9	11	15	18	13	17
IUI partner	3.3	34	46	45	48	58
IVF own gametes	2.4	94	131	237	264	251
ICSI ejaculated sperm	2.3	385	426	550	645	640
ICSI non-ejaculated sperm	2.1	131	126	146	122	125
PGD	1.9	99	104	131	166	141
All treatments		1456	1491	1853	2119	2117

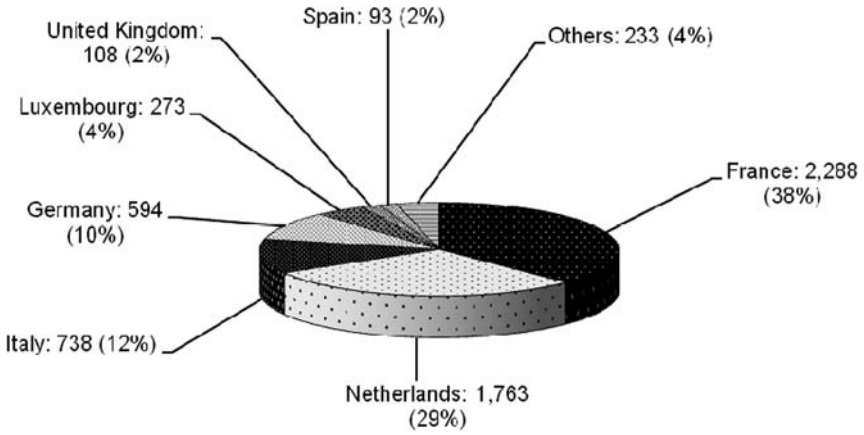

Figure 1 Number of foreign patients per nationality coming to Belgium during the period 2005–2007.

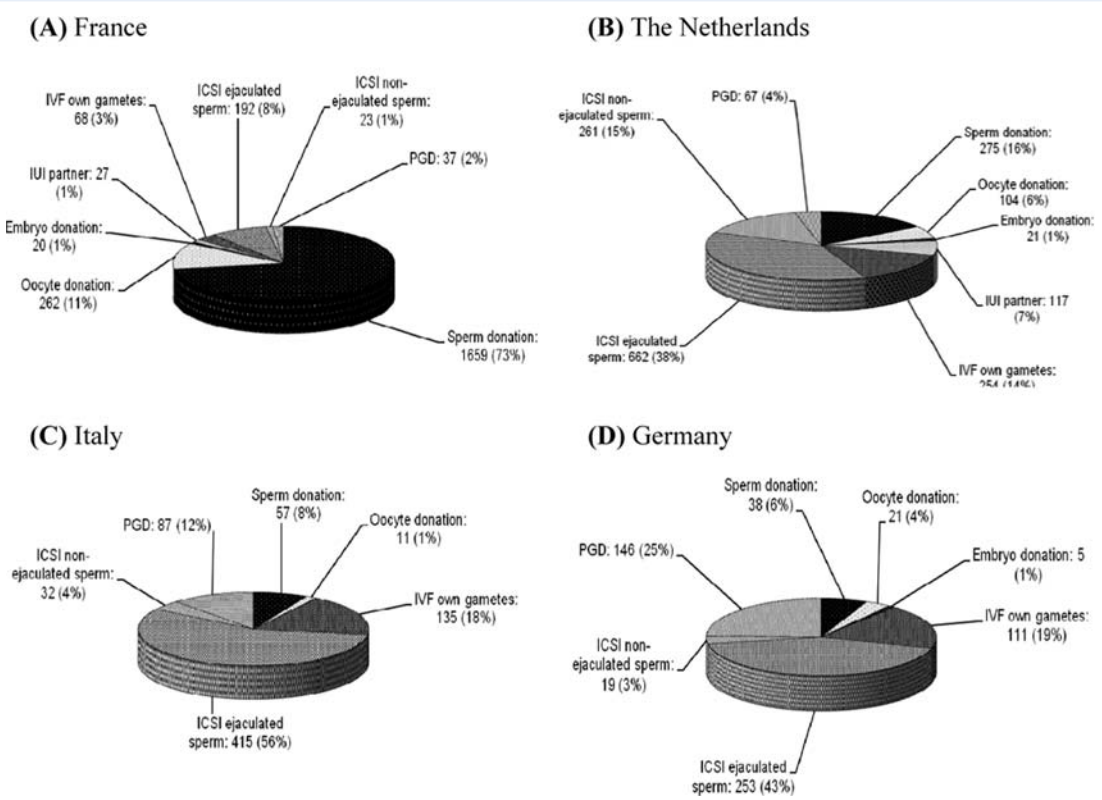

Figure 2 Numbers of patients treated in Belgium, according to country of origin, during the period 2005–2007 for different types of treatment.

2000 till 2003 makes it difficult to estimate the real increase during this period. To outline the evolution of the movements in time, we analysed the data from 2003 onwards. From 2003, the data of 15 of 16 centres were available. It should be kept in mind that a small part of the increase in the period 2003 and 2005 is explained by the added information of one centre. The evolution from 2003 till 2007 varied greatly according to the treatment type (Table IX). Sperm donation increased steadily from 2004. For IVF with own gametes and ICSI with ejaculated sperm, the increase has stopped from 2006. The other types of treatment remained fairly stable.

We also analysed the evolution of patient flows per country and per type of treatment. The graphs for the four most important countries are presented (Fig. 4). Since 2004, there has been a steady increase in the number of French patients coming for donor insemination (Fig. 4A). The other types of treatment remained stable, at less than 100 patients per year. There has been a steady

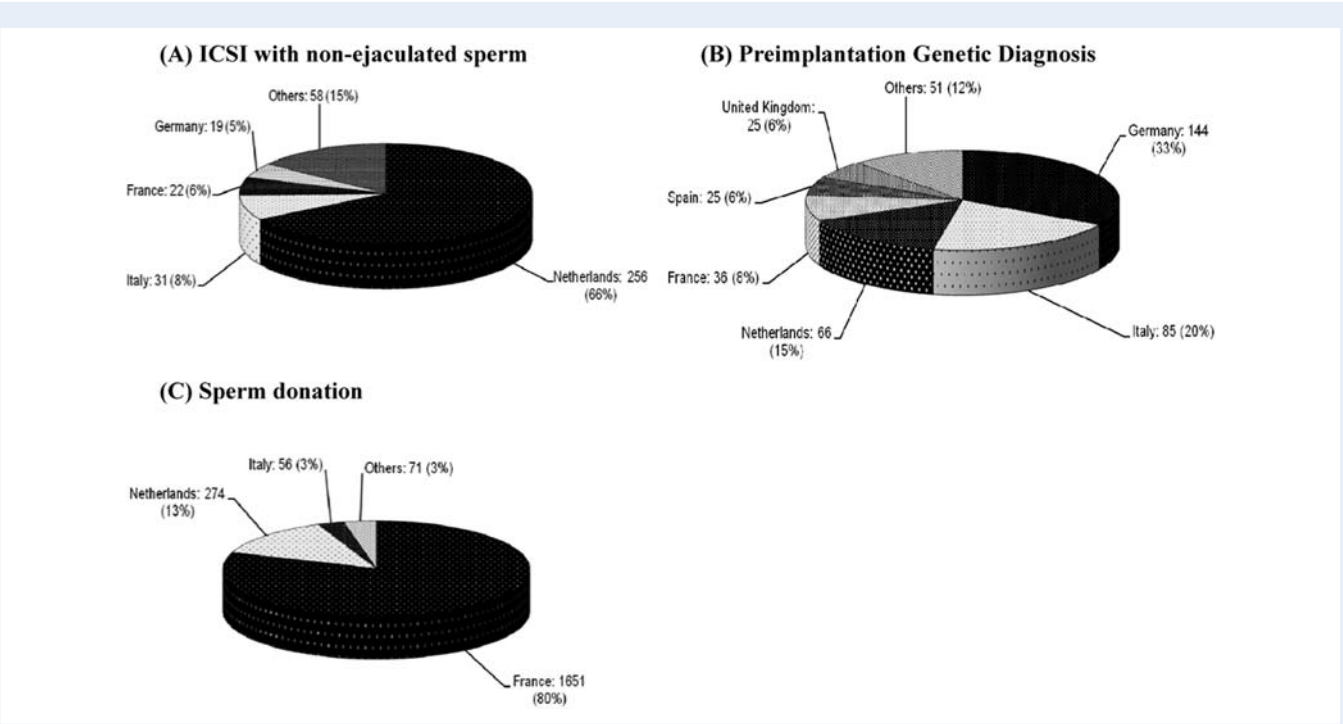

Figure 3 Patients seeking treatment in Belgium 2005–2007 from different countries, according to treatment.

rise of Dutch patients for ICSI with ejaculated sperm until 2006; the number almost doubled for donor insemination between 2004 and 2005. Other treatments remain at the same level, at less than 100 patients per year (Fig. 4B). There was an increase in Italian patients attending for ICSI with ejaculated sperm (Fig. 4C), and the same was true for IVF with the partners' own gametes. In 2006, a small decrease is observed in patients arriving for PGD. There was an increase in German patients until 2005 and a slight decrease afterwards both for ICSI with ejaculated sperm and for IVF with own gametes (Fig. 4D). With the exception of PGD (around 50 patients per year), other types of treatment remained stable at a low level (less than 15 patients per year).

Spread of foreign patients over centres

In the Brussels region, infertility patients from 19 different nationalities (counting only nations with more than five patients per year) could be found. The Flemish centres attracted nine different nationalities while in the Wallonian centres only French and Luxembourgian citizens were reported. The clinics located in Wallonia were considerably less internationally oriented and mainly recruited patients from adjacent countries (France and Luxembourg border Wallonia) with a common language.

The percentage of foreign patients within the total number of patients in a centre ranged from close to zero to 41.4% (Table X). There was a positive correlation between the size of the centre and the percentage of foreign patients they treat. The top five of the centres in terms of total number of treatment cycles for Belgian and non-Belgian patients together in 2005–2007 performed 72% of all cycles for foreign patients for that period. Thus, the treatment of foreign patients was concentrated in a small number of large infertility centres.

The centres tended to specialize in certain types of treatment for foreign patients; one performed the most embryo and oocyte donations to foreign patients, another ranked highest for IUI with partner sperm and ICSI with non-ejaculated sperm and yet another performed most cycles on three types of treatment: ICSI with ejaculated sperm, PGD and sperm donation.

Discussion

In general, Belgian infertility centres welcomed foreign patients. Apart from the rule that they have to pay in advance (which can be explained by the obvious difficulty of claiming money from a person living abroad), there were no special rules or restrictions for foreign patients. Women needing oocyte donation were asked to bring their own donor but the same applied to Belgian patients due to the shortage of volunteers. This condition was not imposed on recipients of donor sperm since the shortage of semen donors is remedied by import. A number of centres obtain their sperm from donor banks abroad since the supply of Belgian donors was (and is) largely insufficient. Only three centres reported a restriction on the number of foreign patients. It is probable that this limitation was designed to protect Belgian patients from unacceptably long waiting times. The majority made special efforts to accommodate foreign patients, with facilities and arrangements to support foreign patients organized by the clinic. However, efforts to actively recruit and attract foreign patients were limited and mostly restricted to a website in English. Although no centre reported active publicity on international websites in this study, some of them do engage in this practice. In 2007,

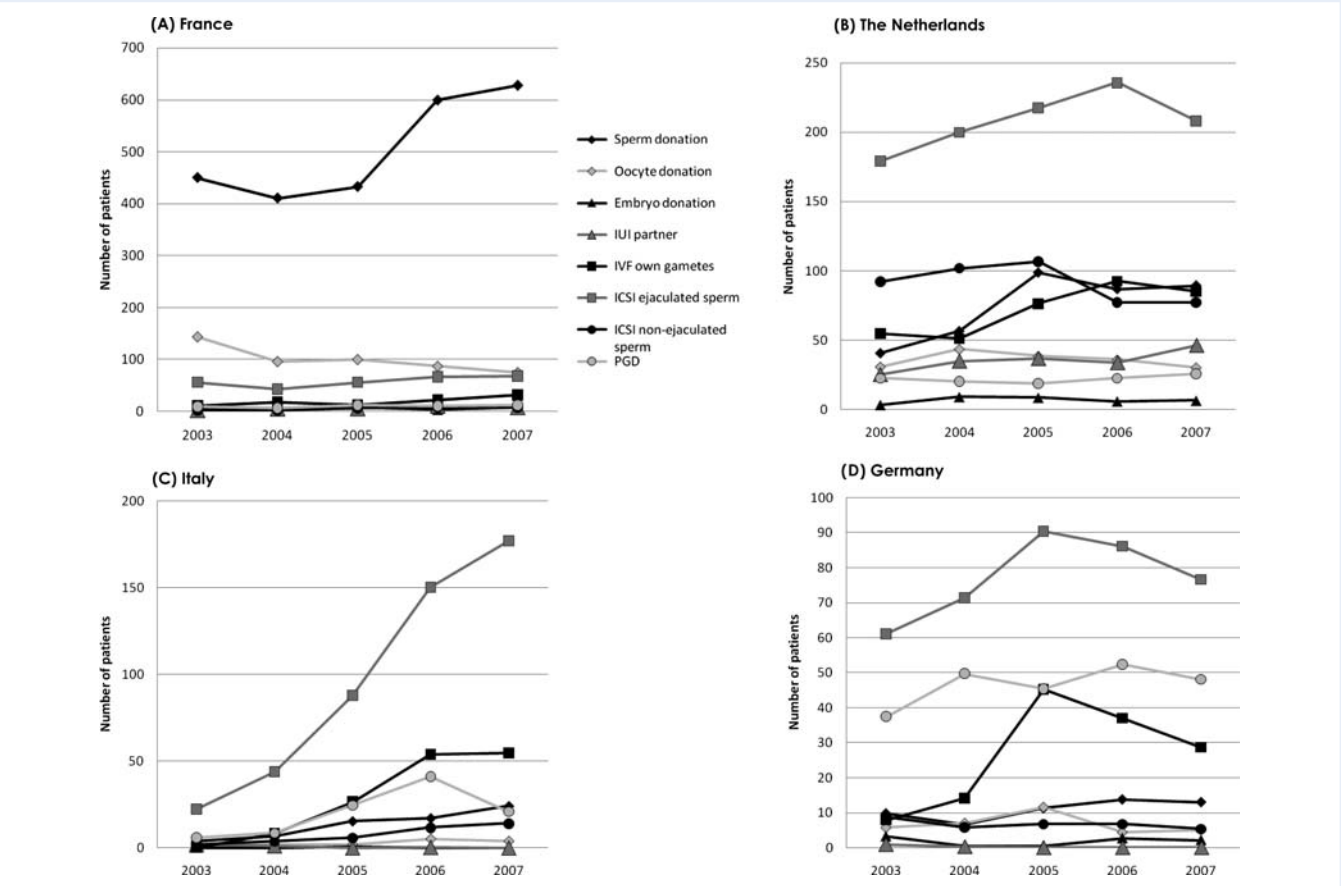

Figure 4 Number of patients treatment in Belgium between 2003 and 2007, according to treatment types and country of origin.

Table X Treatments for foreign patients in proportion to total number of treatments 2005–2007

Ranking of centres according to size	Total number of treatments	Total number of treatments for foreign patients	Percentage of treatments for foreign patients on total number of treatments
1	21 993	5490	24.96
2	11 910	3036	25.49
3	7472	1624	21.73
4	6625	1636	24.69
5	5993	547	9.13
6	5726	157	2.74
7	5590	2314	41.40
8	4860	1050	21.60
9	4408	56	1.27
10	4171	75	1080
11	3795	149	3093
12	3406	159	4.67
13	3401	548	16.11
14	2636	205	7.78
15	1730	1	0.05
16	1461	52	3.56

Healthcare Belgium was established as a non-profit organization that brings together 11 Belgian clinics (www.healthcarebelgium.com). The main objective of this organization is to provide information on Belgian medical services to foreign patients and healthcare providers. The organization also indirectly provides other practical assistance for a trip to Belgium, such as accommodation and personal assistance. Five centres of reproductive medicine that participated in this study are members of this organization through their clinic. The fact that publicity through this organization was only mentioned by one respondent may be explained by the fact that few people knew about it and/or that its effects were small.

The hospitality to foreign nationals can also be deduced from the absence of important problems. Keeping appointments and language problems were mentioned most frequently. All sorts of problems were mentioned as less important but it is unclear whether these were different from the problems encountered with Belgian patients.

Law evasion

An important reason why cross-border reproductive care generates so much interest is the element of law evasion. Our data show that there is a clear correlation between certain legal prohibitions in the patient's country of origin and the number of patients who travel abroad. The changes in numbers of patients coming from a specific country for a specific treatment and changes in the law in that country are clearly related. However, although it is clear that people applying for a type of treatment that is legally prohibited in their country are circumventing the law in their country, the reverse cannot be concluded when the type of treatment is allowed. They may still be evading a legal restriction. In order to deduce from patients' cross-border moves whether they are evading the law, one should look in detail at the regulations of their home country in combination with the patient's personal characteristics. The term 'law' should be interpreted in a broad sense as referring to legal restrictions, professional guidelines and/or generally accepted institutional policies. In the Netherlands, for instance, the Dutch Society of Obstetrics and Gynaecology (NVOG) issued a guideline in 1998 that the application of IVF above the age of 41 is not worthwhile (NVOG, 1998). The Special Medical Treatments Act required licensed centres to adhere to this guideline. As a consequence, many Dutch clinics have been reluctant to accept women over 40. So, although there is no maximum age limit directly imposed by law, older Dutch women are avoiding a guideline when they travel abroad. The same reasoning applies to the availability of ICSI with surgically obtained sperm. This treatment is no longer banned in the Netherlands but for some Dutch patients it will be easier to go to a Belgian clinic than to one of the two clinics participating in the research protocol. In a number of cases, the patient's wish to go abroad is prompted not by a direct legal prohibition or guideline but by the indirect effects of the law. In Italy, both types of treatment for which most Italian patients come to Belgium (ICSI with ejaculated sperm and IVF with own gametes) are allowed. However, the 2004 law does not permit the creation of more than three embryos, does not allow cryopreservation or selection of the embryos and forces patients to have three embryos replaced. This restricts the success rate of IVF and increases the multiple pregnancy rate (Setti *et al*., 2008). Apparently, these limitations in the application of IVF are sufficient for a number of Italians to look for treatment abroad.

Analysis by nationality

In the period 2005–2007, 8205 sperm donations were done for foreign patients. About 80% of those ($N = 6603$) were done for French women. In 2007, 2497 cycles of sperm donation were performed for French patients compared with 436 cycles of all other types of treatment together. Anecdotal evidence indicates that the majority of this group is accounted for by homosexual female couples. The news that donor insemination was available for lesbians in Belgium had spread rapidly in the gay community in France, through gay organizations and by word-of-mouth publicity. Single heterosexual French women are also denied access to fertility treatment by law, and availed themselves of the opportunities in Belgium but in fewer numbers. Together they had a large impact even on the total number of treatments offered to foreigners. This also explains why clinics that do not offer treatment to lesbian couples, such as the catholic hospitals, had considerably fewer foreign patients.

The flow of Dutch patients to Belgium for infertility treatment has a long history. De Sutter *et al*. (2003) outlined the different steps in the evolution: first, couples with severe male infertility coming for ICSI because of insufficient capacity in The Netherlands; later, patients over 40 with a reduced chance of success; then, patients who already received three reimbursed cycles; and finally, patients coming for microsurgical epididymal sperm aspiration (MESA) and testicular sperm extraction (TESE). Regarding sperm donation, there was a steep increase between 2004 and 2005 (going from approximately 200 cycles to 400). In 2006 and 2007 the number slightly decreased and remained stable around 350 cycles per year. The sharp increase in 2004 may be due to the change of legislation in The Netherlands. A new law was passed in 2004 that abolished gamete donor anonymity. The offspring conceived by gamete donation were given the right to know the identity of the donor when they reached the age of 16. In the 15 years during which the law was debated, the number of donors diminished by $>70\%$ and the number of sperm banks by 50% (Janssens *et al*., 2006). Ombelet *et al*. (2007) also referred to the 2004 law on donor information to explain the sudden increase of Dutch patients in their clinic. In addition to the reduced offer in their own country, it can be hypothesized that a number of Dutch patients disagree with the new rule and travel to obtain an anonymous donor. The Belgian law guarantees anonymity for gamete donors unless both donor and recipient agree otherwise (Pennings, 2007).

Surprisingly, the UK constitutes only 2% of all foreign patients treated in Belgium. Whilst access to treatment within the National Health Services, is limited, during the study period, patients from the UK were not being treated in significant numbers in Belgium. Possibly fertility treatment is being sought in other European countries such as Spain (Tremlett, 2006; Bergmann, 2007). Empirical data from future research are needed to corroborate this statement.

Analysis by type of treatment

The link between legislation and/or guidelines and cross-border treatment is illustrated by the data on ICSI with non-ejaculated sperm (Fig. 2). Sixty-six percent of all treatments of this type were performed for patients from The Netherlands. In 1996, the Dutch Society of Obstetrics and Gynaecology issued a moratorium that was later adopted by the Ministry of Health, Well-being and Sports. During that period, the use of non-ejaculated sperm for ICSI was prohibited.

In 2007, the Central Commission on Human Research approved a research proposal by two clinics (Amsterdam and Nijmegen). Since 1 July 2007, the use of sperm obtained by testicular sperm extraction is accepted as part of a research protocol that looks at the efficiency and safety of the technique (Kremer and Visser, 2008). In fact, the number of cycles of ICSI with non-ejaculated sperm for Dutch patients in Belgium decreased from 2005 (going from 220 in 2005 to 159 in 2007). Nevertheless, they remain the majority nationality receiving this treatment in Belgium.

According to a European study on PGD, Belgium is one of four major receivers of patients within Europe (Corveleyn *et al*., 2008). In Germany, only polar body analysis is allowed. Blastomere extraction is prohibited by the German Embryo Protection Law. The Netherlands in general have a highly restrictive attitude towards PGD. Only one centre offers PGD (Academic Hospital Maastricht) and then only for very serious diseases with a very high percentage of penetrance. There has been a broad and emotional public debate early 2008 on PGD for familial breast cancer (BRCA). The application of PGD for these diseases was stopped by the previous secretary of State in 2006. The new secretary of State decided in May 2008 to allow PGD for BRCA again, but on a case-by-case basis. The non-availability of PGD for specific diseases is one of the reasons why many Dutch patients seek treatment in Belgium (Musters *et al*., 2008). Limited test availability and long waiting lists are also cited (Corveleyn *et al*., 2008). However, the patient flow from the Netherlands may diminish in the coming years because of the increased capacity of the genetics centre in Maastricht and the start of transport PGD with two other Dutch IVF centres (de Die-Smulders, Evers and Geraedts, 2008). The numbers of Italian patients seeking PGD in Belgium can be explained by the Italian law on assisted reproduction of 2004, by which PGD with embryo selection is forbidden.

Evolution in time

The general stabilization of the inflow of patients may be due to numerous factors; changes in legislation in other countries (certain types of treatment become allowed or new categories of patients become eligible), or other countries offer better service with shorter waiting lists. There is, for instance, a steady decline in the demand for oocyte donation going from 287 cycles in 2003 to 188 in 2007. There are relatively few oocyte donors in Belgium and most patients are asked to bring their own donor. The decrease in patients could be explained by the fact that countries such as Spain have a good international reputation for this type of treatment, and attract people from all over Europe. German patients seeking oocyte donation, a protocol forbidden by German law, may visit the Czech Republic rather than Belgium.

Certain alterations in the numbers can be explained by specific events. There was an immediate increase of Dutch patients attending for donated sperm treatment after the abolishment of donor anonymity in The Netherlands. As indicated above, the effect of the Italian legislation is broader than the specific prohibition of certain types of treatment. The fastest rising treatments among Italian patients were ICSI with ejaculated sperm (100 cycles in 2004, 200 in 2005 and 350 in 2006) and IVF with own gametes.

Spread among centres

Most foreign patients attend clinics in the Brussels region. The attractiveness of these clinics can be explained by several factors; accessibility (international train station and airport), the presence of large infertility centres with an international reputation and the languages spoken. However, it proves to be very difficult to determine which factors play a role in the attractiveness of centres for foreign patients. Size and location clearly matter but are not decisive. In one provincial city, there are two infertility centres of which one did 2.7% of its treatment cycles for foreign patients while the other did 24.7%. The academic status of a centre is also not decisive, although there is a link with the size of the centre. One might expect foreign patients to use this status to select a centre since they might believe that centres located in university hospitals provide better quality care and apply up-to-date techniques. However, some university centres treat a large number of foreign patients while others see few, and vice versa for non-university centres. Part of the differences between centres may be explained by numerous idiosyncratic factors; a new doctor brings patients from another clinic, a change in policy, a doctor with good relationships with colleagues or clinics abroad to name a few.

Conclusions

The data presented here give a fairly complete picture of the intake of foreign patients in Belgium for infertility treatment. However, the following points have to be taken into account: (i) 2 of the 18 B-centres did not provide data, (ii) the survey was restricted to the B-centres, meaning that foreign patients who came for technologically less demanding treatments such as hormonal stimulation and artificial insemination with or without donor sperm were not registered, and (iii) no data were included for patients who came from countries from which less than five patients per year were treated in a centre. However, given the high response rate, this study gives a reliable view of the extent of the phenomenon in Belgium.

The number of foreign patients entering Belgium for medically assisted reproduction has stabilized since 2006. Only for sperm donation, there was a steady increase. Unsurprisingly, most patients were residents of the neighbouring countries. Within the total number of cycles performed for foreign patients, sperm donation to French women account for the majority. ICSI with ejaculated sperm is the second most popular type of treatment. Apart from the institutional policy decision to accept lesbian couples or not, the main factor that attracts foreign patients seems to be the location of the centre. Brussels centres have a considerable advantage due to accessibility. Centres in the Walloon region welcome almost exclusively patients from France and Luxembourg while the centres in Flanders and Brussels welcome patients from a large range of countries.

More research is needed to obtain a complete picture of the phenomenon of cross-border reproductive care. The collection of data on the numbers of patients moving from one country to another is a first and important step. However, other research should include the experiences of patients, the difficulties they experience, the impact of such movements on the national healthcare systems, the effects of, for instance, portability of insurance on the

numbers, etc. It will only be possible to evaluate the phenomenon properly when a full picture can be patched together.

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